UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.

Petitioner,

v.

NIKOLA CORPORATION

Patent Owner.

Case No. IPR2019-01646
U.S. Patent No. 10,077,084

DECLARATION OF BRIAN BAKER

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I, Brian C. Baker, declare and state as follows:

I. BACKGROUND AND QUALIFICATIONS

1. I have been retained by the law firm of Knobbe, Martens, Olson & Bear, LLP, which I understand represents Tesla, Inc. ("Petitioner") in connection with this proceeding. I have been asked by counsel to review relevant materials and render my expert opinion in connection with a Petition for *Inter Partes* Review ("IPR") of U.S. Patent No. 10,077,084 ("the '084 patent") that I understand Petitioner will file. This declaration sets forth my own analysis, opinions, and conclusions based on my own consideration of the '084 patent, the prior art, and other materials identified herein. I understand that Petitioner will rely upon my analysis, opinions, and conclusions in support of the Petition. However, the Petition has not been provided to me, I have not reviewed the Petition, and I have not based my analysis, opinions, and conclusions on the Petition.

2. I am an expert in the field of automotive design and am well versed in designing aesthetic and functional features of vehicles, including features related to ergonomic and safety issues. I have studied, researched, taught, and practiced in the field of automotive design for approximately 40 years.

3. I received Bachelor of Science (B.S.) degree with honors in the field of Transportation Design from the Art Center College of Design in Pasadena, California in 1984. After receiving my B.S. degree, I worked as an automotive

designer at General Motors Corporation's Technical & Design Center in Warren, Michigan for more 25 years, from 1984 to 2009. While there, I worked on multiple automotive design projects, including Chevrolet trucks and cars and Cadillac SUVs and cars. I lead a team of 30 people in the creation of advanced vehicle proposals for all of GM's divisions. This included aerodynamic studies, vehicle packaging, styling proposals and ergonomic and safety features for vehicles of all sizes.

4. In 2009, I founded the automotive design consulting firm AutoArcheology LLC. I have worked as an automotive design consultant with that firm from its founding until the present. I have consulted for major automotive companies, including Ford Motor Company, Hyundai, Mercedes Commercial Vehicles, Integra Motorcoach, and Fiat Chrysler Automobiles, on numerous design projects, including the design of motorcoach interiors and exteriors, aesthetic differentiation, future design strategies, and upfitting of commercial vehicle interiors. All of these projects include styling, packaging, ergonomic and safety considerations.

5. While working as an automotive designer and consultant in the automobile industry, I have also taught university-level classes in automotive design for 30 years. For example, from 1988 to 1990, I was an adjunct professor in the School of Industrial Design at Wayne State University in Detroit, Michigan.

From 2007 to the present, I have taught a course in the history of modern designs at the College for Creative Studies in Detroit, Michigan. And from 2010 to the present, I have taught a course in the history of modern industrial and vehicle design at the School of Design of the Lawrence Technical University in Southfield, Michigan.

6. I have received a patent and several awards for my contributions to vehicle design. I am a named inventor of U.S. Patent No. 6,347,828, which relates to an actuation mechanism for a two piece retractable hard-top roof for a convertible truck. This patent stemmed from my design work as the senior lead designer of the Chevrolet SSR convertible truck while I was working at General Motors. I also received an award for the "Most Significant Concept" at the 2000 North America International Auto Show in connection with my work on the Chevrolet SSR. In addition, I was a design historian for the ESPN TV program "Harley Earl and NASCAR" and received a bronze medal from the Book Publishers Association for my work on the book Driving Style: The first century of GM design.

7. I have given presentations as an expert on automotive design at numerous conferences, including the India Automotive Summit in 2014, the ITB Futures conference in 2016, the IQPC Advanced Lighting Strategies Conference in 2018, the American Cultural Immersion Conference in 2018 in Japan, and the

Autonomous Vehicle Conference in 2018 in Detroit. As a speaker at these conferences I am called upon to opine on vehicle trends and the future of transportation.

8. A copy of my latest curriculum vitae (C.V.) is submitted with this declaration as Ex. 1017.

9. My compensation is in no way contingent on the results of these or any other proceedings relating to the above-captioned patent.

II. INFORMATION AND MATERIALS CONSIDERED

10. In order to render my opinions in this matter, I primarily reviewed the specification and claims of the '084 patent (Ex. 1001), its file history (Ex. 1003), and various prior art references identified herein. My review included at least the following exhibits:

Exhibit No.	Description
1001	U.S. Patent No. 10,077,084 ("the '084 patent").
1003	File History of the '084 patent.
1004	PCT Application Publication No. WO 2009/001086 A2 to Modec Limited ("Modec").
1005	U.S. Patent No. 7,338,335 to Messano ("Messano").
1006	October 2010 *Fleet Transport* magazine ("Fleet Transport").
1007	The Maintenance Council of the American Trucking Association, Future Truck Committee Information Report: 2001-2, 3 (Mike Malecha et al., eds., March 2001) ("Future Truck

	Report").
1008	U.S. Patent No. 4,932,716 to Marlowe ("Marlowe").
1009	PCT Application Publication No. 1981/001587 A1 to Eltra Corporation ("Eltra").
1010	U.S. Patent Application Publication No. 2003/0006628 A1 to Racz ("Racz").
1011	2013 Kia Sedona User Manual ("Kia").
1012	U.S. Patent No. 7,145,788 B2 to Plummer ("Plummer").
1013	2012 Annual Report of the Man Group ("Man Annual Report").
1014	Loczi, Josef. "Ergonomics Program at Freightliner." SAE Transactions, vol. 109, 2000, pp. 462–469 ("Freightliner").
1015	U.S. Patent Application Publication No. 2008/0164724 Al to Burnett ("Burnett").
1016	Definitions of "adjacent" from unabridged.merriam-webster.com
1017	My *Curriculum Vitae*
1018	Printout of JSTOR webpage referring to Loczi, Josef. "Ergonomics Program at Freightliner." SAE Transactions, vol. 109, 2000, pp. 462–469
1019	Images accessed from JSTOR webpage of Loczi, Josef. "Ergonomics Program at Freightliner." SAE Transactions, vol. 109, 2000, pp. 462–469
1020	U.S. Patent Publication No. 2008/0191515 to Hollenbeck ("Hollenbeck").
1021	U.S. Patent Publication No. 2011/0121606 to Engelbrecht ("Engelbrecht").

11. The above references are in addition to any other materials referenced directly or indirectly in this declaration. I expect to review additional materials that are provided by the parties as this proceeding progresses.

III. APPLICABLE LEGAL STANDARDS

12. I am not an attorney. For purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of the law is as follows.

13. I have been informed and understand that claim construction and patentability is generally analyzed from the perspective of a hypothetical person of ordinary skill in the art of the invention at the time of the invention.

14. I believe that "automotive design" is the relevant art or field of the invention for purposes of assessing the patentability of the '084 patent. This is consistent with the identification of the "technical field" in the '084 patent, which states:

> The disclosure relates generally to systems, methods, and devices for an automobile door or window, and more particularly relates to methods, systems, and devices for a door on a semi-truck vehicle.

Ex. 1001 at 1:27-30. Based on this identification of the "technical field," it would be possible to define the relevant art or field more narrowly as "automotive door design" or even "semi-truck door design." However, I believe that the more

general category "automotive design" is appropriate because a typical person in charge of designing an automobile door or a semi-truck door would be a generalist within the broader field of automotive design. Further, a person of ordinary skill in the art of "automotive design" would be familiar with design concepts relevant to vehicles of all sizes, including semi-trucks. In my view, defining the relevant art or field more narrowly than "automotive design"—such as "automotive door design" or "semi-truck door design"—would not fundamentally change my analysis and conclusions that the claims of the '084 patent would have been obvious. In fact, if anything, a narrower definition of the art or field of the invention would make it even easier for a person of ordinary skill in the art to conclude that the claims of the '084 patent would have been obvious.

15. The '084 patent refers in general terms to electrical components such as an electric drive train and electric batteries. However, the '084 patent does not disclose or claim innovative or new ways to make those electrical components. Rather, the features that the '084 patent assert to be innovative relate to the relative positioning of the door, seat, and front wheel well to make it easier and safer for a driver to enter and exit the vehicle. Accordingly, while a person of ordinary skill in the art would be familiar with basic design features of electric semi-trucks that would affect the relative positioning of the door, seat, and front wheel well, the person of ordinary skill in the art would not likely be, and would not need to be, an

electrical engineer or expert in the details of how the electrical components of electric semi-trucks work, in order to assess the patentability of the claims of the '084 patent.

16. I have been informed and understand that, for purposes of this IPR, the time of the invention is the effective filing date of the '084 patent. I understand the effective filing date of the '084 patent could be sometime between December 30, 2015, which is when the first provisional application related to the '084 patent was filed, and December 30, 2016, which is when the actual application resulting in the '084 patent was filed. Because all of the prior art and other evidence upon which I rely would have been known to a person of ordinary skill in the art more than a year before the earliest December 30, 2015 date, I do not believe it makes any difference to my analysis or opinions whether the effective filing date of the '084 patent is December 30, 2015 or a later date. Accordingly, while I have not conducted any analysis and express no opinion about whether December 30, 2015 is the effective filing date of the '084 patent, I have assumed, solely for the purpose of my analysis and opinions in this IPR, that December 30, 2015 is the effective filing date of the '084 patent. For conciseness, in this declaration I sometimes refer to the time period before December 30, 2015 as the "relevant time."

17. In my view, a person of ordinary skill in the art at the relevant time would have had at least a Bachelor of Science degree in an industrial design field and at least two years of experience in automotive design.

18. As described above, I have extensive experience in automotive design. Based on my experience, I have a good understanding of the relevant field at the relevant time. I also have an understanding of the capabilities of a person of ordinary skill in the relevant field at the relevant time. I have supervised and directed many such persons over the course of my career. Further, I had at least those capabilities myself at the relevant time. My experience includes years of consumer research under controlled conditions to assess consumer preferences, including which designs functioned to make entry and exit from vehicles comfortable and safe for consumers.

19. Unless expressly stated otherwise herein, I conducted my analysis and reached the conclusions stated herein from the perspective of a person of ordinary skill in the art at the relevant time. Accordingly, it should be understood, even if not expressly stated, that my opinions stated herein are from the perspective of a person of ordinary skill in the art at the relevant time. For example, to the extent I opine that a claim of the ’084 patent would have been obvious, I mean that the claim would have been obvious to a person of ordinary skill in the art at the relevant time.

20. I have been informed and understand that the first step of a patentability analysis is to construe the claims. I understand that the claim construction standard applicable to the '084 patent is called the "*Phillips* claim construction standard" or "*Phillips* standard," based on the name of an appeals court case. I understand that, under the *Phillips* claim construction standard, claim terms are generally given their ordinary and customary meaning to a person of ordinary skill in the art at the time of the invention after reading the entire patent. Ordinary meaning may be evidenced by a variety of sources, including the words of the claims themselves, the written description, the drawings, and extrinsic sources. The ordinary meaning must be consistent with the specification.

21. I have been informed and understand that a patent claim is unpatentable as "anticipated" if a single prior art reference discloses every claim limitation as arranged in the claim. I understand that the reference need not use the exact same words as the claim as long as the reference discloses the same subject matter expressed by the claim language.

22. I have been informed and understand that a patent claim can still be unpatentable, even if it was not anticipated, if the differences between the subject matter of the claim and the prior art would have been obvious to a person of ordinary skill in the art at the relevant time. I have been informed and understand

that a determination of whether a claim would have been obvious should be based upon several factors, including, among others:

- the level of ordinary skill in the art at the time the application was filed;
- the scope and content of the prior art;
- what differences, if any, existed between the claimed invention and the prior art; and
- any known secondary considerations of non-obviousness, such as commercial success of the claimed invention due to the claimed features, long-felt but unsolved needs, and failure of others.

23. I have been informed and understand that the teachings of a single reference may be modified, or two or more references may be combined and modified, to support a conclusion that a claim would have been obvious to a person of ordinary skill in the art at the relevant time. I understand that a determination of obviousness based on a modification or combination of references must be supported by a showing that a person of ordinary skill in the art would have had a motivation or reason to modify or combine the references.

24. In determining whether a combination based on either a single reference or multiple references would have been obvious, it is appropriate to consider, among other factors:

- whether the teachings of the prior art references disclose known concepts combined in familiar ways, and when combined, would yield predictable results;
- whether a person of ordinary skill in the art could implement a predictable variation, and would see the benefit of doing so;
- whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art;
- whether a person of ordinary skill in the art would have recognized a reason to combine known elements in the manner described in the claim;
- whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; and
- whether the innovation applies a known technique that had been used to improve a similar device or method in a similar way.

25. I have been informed and understand that in considering obviousness, it is important not to determine obviousness using the benefit of hindsight derived from the patent being considered.

IV. OVERVIEW OF THE '084 PATENT

26. The earliest effective filing date of the '084 patent is December 30, 2015, when the first provisional application to which the '084 patent claims priority was filed. Ex. 1001, cover page 2. The effective filing date of the '084 patent may be as late as December 30, 2016, when the actual application from which the patent issued was filed. *Id*., cover.

27. The '084 patent is entitled "Systems, Methods, and Devices for an Automobile Door or Window." *Id*. The specification asserts that Applicants for the '084 patent invented a new "semi-truck door" design "that allows a user to safely and comfortably enter and exit the vehicle." *Id.* at 2:21-23. The specification describes the "technical field" of the alleged invention as "systems, methods, and devices for an automobile ***door*** or window" and, in particular, "methods, systems, and devices for a ***door on a semi-truck vehicle***." *Id.* at 1:27-30 (emphases added). Accordingly, the '084 patent does not describe an innovative new type of semi-truck vehicle or an innovative new engine or drive train for a semi-truck vehicle. The specification makes clear that the alleged invention is merely an allegedly new way to position the door to make entry and exit from the vehicle easier and safer.

V. STATE OF THE ART BEFORE THE '084 PATENT

28. The '084 patent explains the alleged problem with prior art semi-truck doors as follows:

> Vehicle doors, and particularly semi-truck doors, often provide immediate access to a seat located in the body of the vehicle. The doors are often hinged and require a user to enter or exit the vehicle at an angle that may be uncomfortable or even dangerous. Semi-truck doors and seats are located a significant distance above the ground and a user must be cautious to avoid injury when ascending the steps to the semi-truck door, opening the hinged semi-truck door, and sliding on to the seat while closing the hinged door.

Id. at 1:36-45. However, the fact that climbing through a door directly into a semi-truck seat may be uncomfortable or dangerous was recognized in the trucking industry many years before Applicants identified this problem in the '084 patent. That the background section of the '084 patent mentions these disadvantages of the traditional position of semi-truck doors shows that Applicants understood that these disadvantages were already appreciated in the industry. Further, a report by a trucking industry council of the American Trucking Associations published in 2001 indicated that the traditional position of semi-truck doors is ergonomically disadvantageous and unsafe, resulting in a relatively high level of driver injuries caused by slips. Ex. 1007 at 2-4.

29. Applicants' purported solution of positioning the door so it allows the driver to enter the cabin from behind the seat was also well known in the art long before late 2015. The 2001 trucking industry report referenced above suggested that positioning the door behind the seat to provide rear entry into the cabin would make entry into the vehicle easier and increase safety by reducing driver injuries caused by slips.

30. Multiple prior art references disclosed doors positioned to allow rear-entry into a truck cabin so as to avoid the need to climb directly into the seat years before late 2015. During prosecution of the '084 patent, the Examiner cited at least two such prior art references. The Examiner cited Hollenbeck, a publication of a patent application filed in 2005 and published in 2008, which discloses a rear-entry door (31) in a semi-truck:

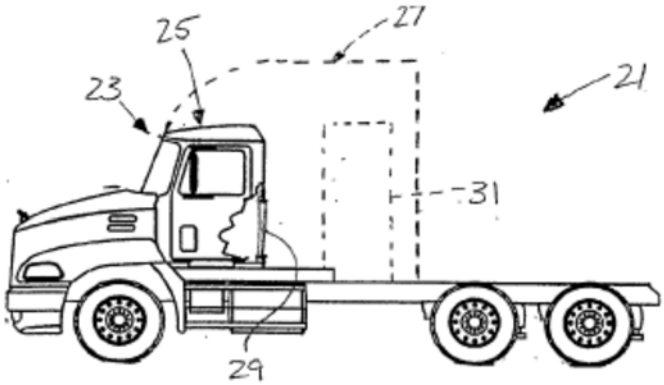


FIG. 1

Ex. 1003, 135-140; Ex. 1020, Fig. 1. The Examiner also cited Engelbrecht, a publication of a patent application with a provisional filing date in 2009 and a

publication date in 2011, which discloses a rear-entry door (37) in a recreational vehicle:

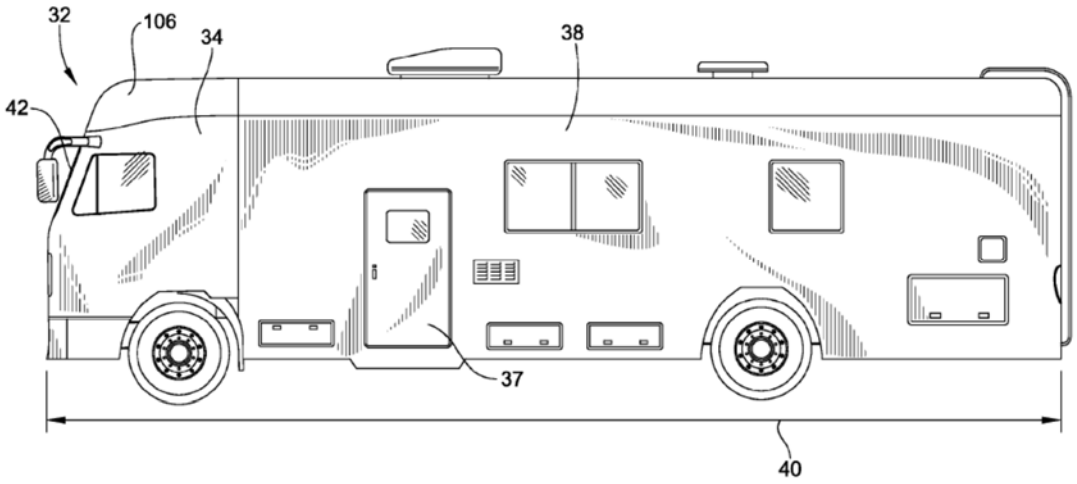


FIG. 3

Ex. 1003, 253-261; Ex. 1021, Fig. 3.

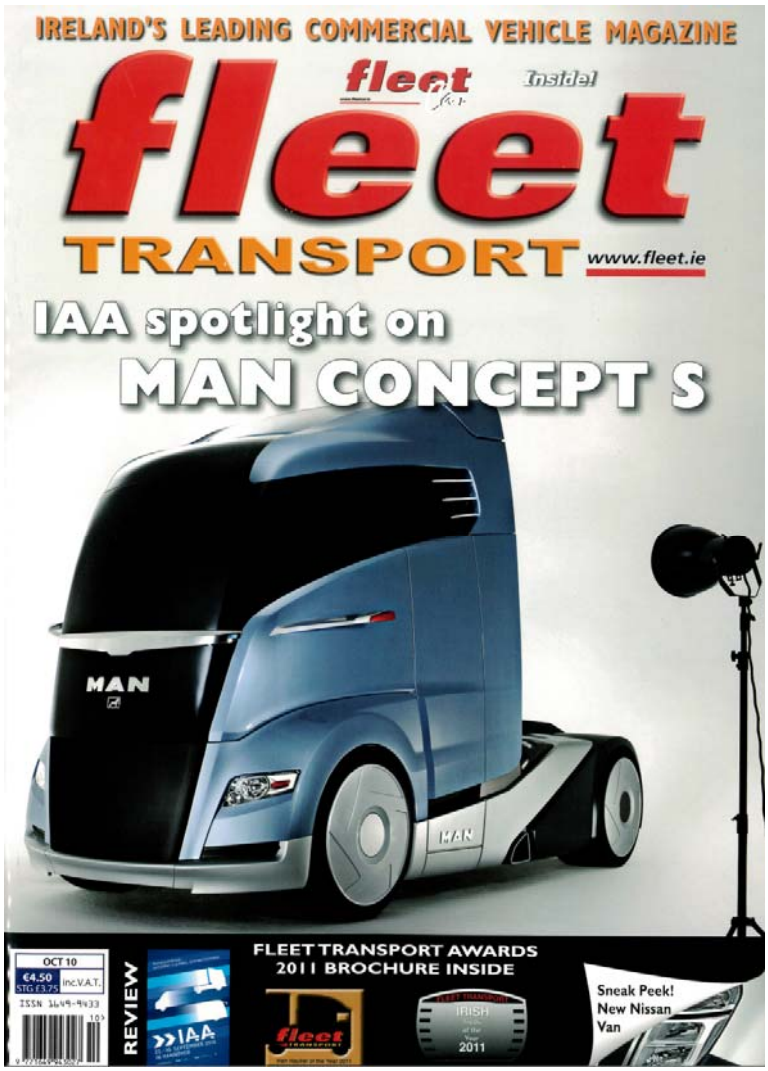
31. Based on the prior art cited by the Examiner, in my view the concept Applicants originally claimed as their invention—positioning the door so the driver can enter the cabin from behind the seat—is indisputably old and unpatentable. Further, separate and apart from any express suggestion in the prior art that such positioning of the door provides for more comfortable and safe entry and exit from the vehicle, a person of ordinary skill in the art would understand from a comparison of the different door-and-seat positioning available in the prior art that positioning the door so the driver can enter the cabin from behind the seat would provide for more comfortable and safe entry and exit from the vehicle.

32. Applicants amended their claims to try to overcome the Examiner's rejections. They specifically made the following claim amendment (with added language underlined and deleted language shown in strikethrough):

> wherein the door is located <u>on the body such that a frontmost side of the door is adjacent to a rearmost portion of a front wheel well and the width of the door is disposed between the frontmost side of the door and the rearmost side of the door, at least a portion of the door being positioned behind the seat and at least a portion of the seat is disposed to be forward of a line defining the rearmost portion of the front wheel well</u> ~~with respect to the body, such that a majority of the width of the door is located at a backside of the seat when the door is in a closed position,~~ such that the door opens to provide ingress and egress into the cabin from a backside of the seat;

Ex. 1003 at 300. The Examiner relied on this amendment as "[t]he primary reason for the allowance of the claims." *Id.* at 328.

33. The limitations added by this amendment—which recite the relative positions of the door, seat, and front wheel well—were well known in the art long before late 2015. For example, the October 2010 issue of the trucking industry magazine *Fleet Transport* published a picture of a "concept truck" with the frontmost side of its frontmost door adjacent to and behind the rearmost portion of the front wheel well.



Ex. 1006 at 1. The picture does not show the seat because the door is closed and the windows are darkly tinted. But the customary and obvious placement of a seat near the front of the windshield would put at least part of the seat in front of the rearmost portion of the front wheel well and would put at least a portion of the door behind the seat.

34. In addition, a PCT application of Modec Limited published on December 31, 2008 expressly discloses the exact door, seat, and wheel well alignment claimed in the '084 patent:

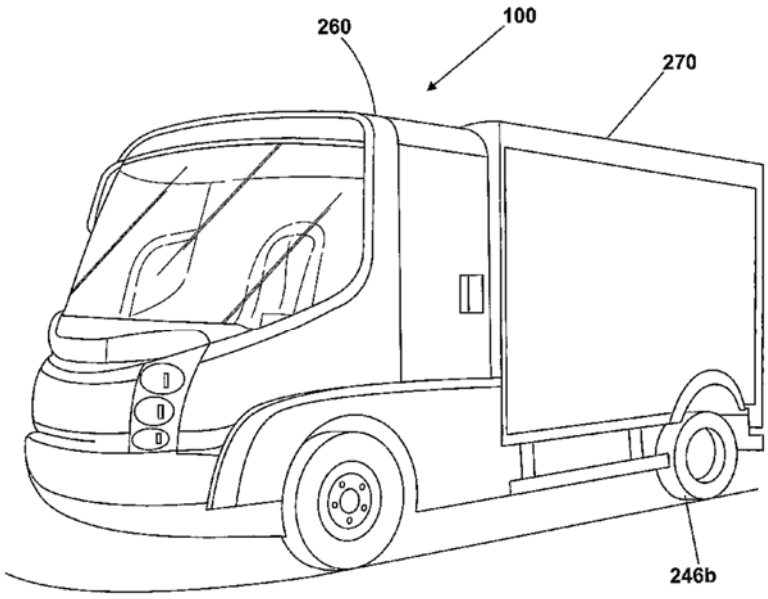


Fig. 1

Ex. 1004, Fig. 1. Modec discloses use of the disclosed door, seat, and wheel well alignment with ***any*** electric commercial vehicle. Ex. 1004 at 14:30-15:2. While Modec does not specifically mention a "semi-truck vehicle," it would have at least encouraged a person of ordinary skill in the art—especially one concerned with the well-known comfort and safety problem of requiring the driver to climb directly into a semi-truck seat—to position the door, seat, and wheel well of an electric semi-truck in the manner disclosed by Modec. Further, U.S. Patent No. 7,338,335 to Messano, which issued in 2008 based on applications dating back to 2001, expressly teaches that electric drive trains can be used with semi-trucks and a wide

variety of other vehicles. Accordingly, the claimed door position recited in the '084 patent is simply not new or non-obvious based on what was well known years before the priority date of the '084 patent.

VI. CLAIM CONSTRUCTION

A. "adjacent to" (all claims)

35. Independent claims 1 and 26 of the '084 patent recite "a frontmost side of the door is ***adjacent to*** a rearmost portion of a front wheel well." Ex. 1001, claim 1 (emphasis added). Dependent claims 2-25 incorporate the same phrase through dependency upon claim 1. Accordingly, every claim includes the phrase "adjacent to."

36. The phrase "adjacent to" is not a specialized technical term with any specialized meaning within the relevant field of automotive design. It is a common English phrase describing the relative positioning of objects located near each other. Accordingly, a person of ordinary skill in the art would consider dictionary definitions to be useful to ascertain the customary and ordinary meaning of "adjacent to." Two dictionary definitions of "adjacent" are "not distant or far off" and "nearby but not touching." Ex. 1016. In my view, these definitions are consistent with (1) the ordinary meaning of the phrase to a person of ordinary skill in the art at the relevant time and (2) the usage of the phrase in the specification of the '084 patent. By contrast, another dictionary definition of "adjacent," meaning

"having a common border : abutting, touching" (*id.*), is inconsistent with the usage of "adjacent to" in the '084 patent, as explained below.

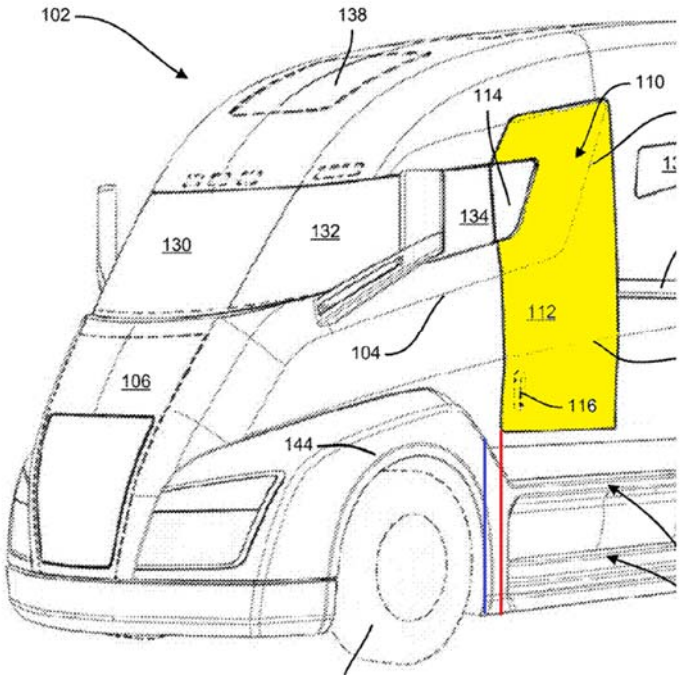
37. The specification of the '084 patent uses "adjacent to" three times. The most relevant paragraph uses "adjacent to" in the specific context relevant to the claim language describing the relative position of the front side of the door and the backside of the front wheel well:

> The front of the vehicle body **102** is denoted by the front windshield **130** and a front side of the door **110** is located ***adjacent to*** a backside of the front wheel well **144**. Alternatively, a portion of the door **110** is located above the front wheel well **144**. In an implementation, a front side of the door **110** is located at least six inches behind a backside of the front wheel well **144**. In an implementation, a front side of the door **110** is located at least twelve inches behind a backside of the front wheel well **144**. In an implementation, a front side of the door **110** is located at least eighteen inches behind a backside of the front wheel well **144**.

Ex. 1001 at 5:23-33 (bolded reference numerals in original; other emphasis added). In this paragraph, "adjacent to" describes a relative positioning in which the front side of the door and the backside of the front wheel well are nearby but not touching each other. The three sentences beginning with "In an implementation" demonstrate that the front side of the door and backside of the front wheel well are nearby but not touching each other. Gaps of six, twelve, and eighteen inches

between these components show that the two components can be adjacent to each other without touching each other.

38. Further, the above paragraph describes Figure 1, which graphically illustrates that the frontside of the door and the backside of the front wheel well are nearby but not touching each other. The following blown-up portion of Figure 1 shows the door (yellow) and a small gap between the frontside (red line) of the door and the backside (blue line) of the front wheel well in the illustrated embodiment. As shown, the frontside of the door and the backside of the front wheel well are nearby each other but do not touch each other.



Ex. 1001, Fig. 1 (annotations added).

39. The specification includes two other usages of "adjacent to" that do not describe the relative positioning of the frontside of the door and the backside of

the front wheel well. However, these other two usages are consistent with construing "adjacent to" to mean "nearby but not touching." The specification discloses that "cabin interior **650** includes a landing **652** adjacent to the door **110**." Ex. 1001 at 10:34-35. The landing is obviously ***nearby*** the door because it is where one first steps upon entering the cabin through the door, but the landing and door itself do not touch each other. The specification also discloses a sliding door embodiment in which the "interior of the cabin includes a landing ***immediately adjacent to*** the sliding door." *Id*. at 2:44-45 (emphasis added). That sentence's usage of "immediately" to further modify "adjacent to" shows that the specification does not use "adjacent to" to mean "having a common border : abutting, touching." There are no degrees of adjacency when "adjacent to" requires actual touching of two components. Thus, it would make no sense to describe two components as being "immediately adjacent to" each other if "adjacent to" by itself required the components to be touching. Therefore, the specification's usage of "adjacent to" is consistent with the dictionary definition "nearby but not touching" but inconsistent with the dictionary definition "having a common border : abutting, touching."

40. Following the sentence that says "a front side of the door **110** is located adjacent to a backside of the front wheel well **144**," the specification includes the following sentence: "Alternatively, a portion of the door **110** is located

above the front wheel well **144**." In the context of the specification as a whole, a person of ordinary skill in the art would not interpret those sentences to mean that locating a portion of the door above the front wheel well is a ***mutually exclusive*** alternative to locating the front side of the door adjacent to the backside of the front wheel well. In other words, a person of ordinary skill in the art would not interpret the "adjacent to" language to exclude every arrangement in which a portion of the door is located above the front wheel well. Further, the "adjacent to" language does not include any requirement that the frontside of the door must be located ***behind***—as opposed to in front of—the backside of the front wheel well. A person of ordinary skill in the art would understand that the "adjacent to" language is satisfied as long as the frontside of the door and the backside of the front wheel well are nearby but not touching each other, without regard to whether any portion of the door is located above the front wheel well.

41. The file history of the '084 patent also supports construing "adjacent to" to mean "nearby but not touching." The patent applicant added the "adjacent to" language to overcome two prior art references that disclose a relatively large gap between the backside of the front wheel well and the frontside of the door. For example, Figure 1 of Hollenback shows a relatively large gap between the frontside of the door 31 and the backside of the front wheel well:

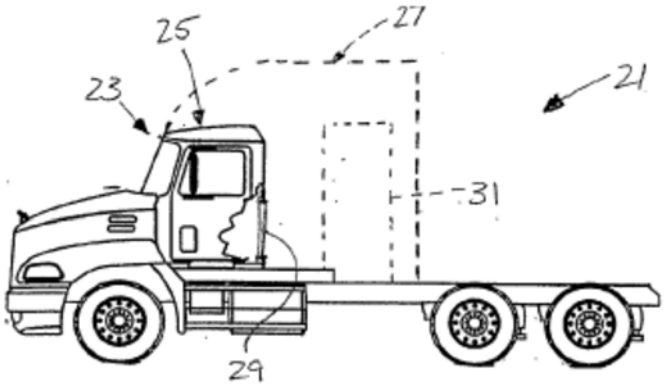


FIG. 1

Ex. 1020, Fig. 1. And Figure 3 of Engelbrecht shows a similarly large gap between the frontside of its door 31 and the backside of the front wheel well:

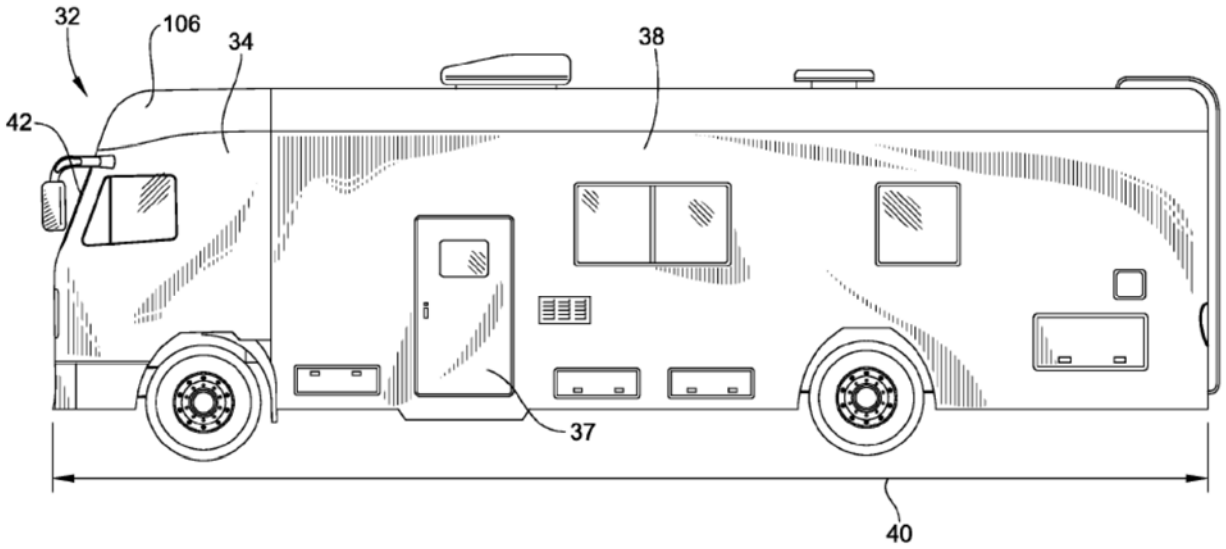


FIG. 3

Ex. 1021, Fig. 3. Accordingly, the addition of the "adjacent to" language overcame these references by requiring a relatively short gap between the frontside of the door and the backside of the front wheel well. There was no need for the "adjacent to" language to take on a more restrictive meaning requiring the

frontside of the door and the backside of the front wheel well to actually touch each other.

42. Accordingly, in view of the customary and ordinary meaning of the claim language, the specification, and the file history of the ’084 patent, in my view the correct construction of “adjacent to” is “nearby but not touching.”

VII. PATENTABILITY ANALYSIS OF THE ’084 PATENT CLAIMS

A. Background and Prior Art Status of the Asserted References

1. The Earliest Effective Filing Date of the ’084 Patent

43. As indicated above, while I have not determined the effective filing date of the ’084 patent, I have assumed, for purposes of my analysis in this IPR only, that the effective filing date of the ’084 patent is December 30, 2015.

2. Modec

44. PCT Application Publication No. WO 2009/001086 A2 to Modec Limited (“Modec,” Ex. 1004) was published on December 31, 2008. Ex. 1004 at 1. I understand that Modec is prior art to the ’084 patent.

45. Modec discloses the “electric vehicle 100” illustrated by Modec’s Figure 1, reproduced below:

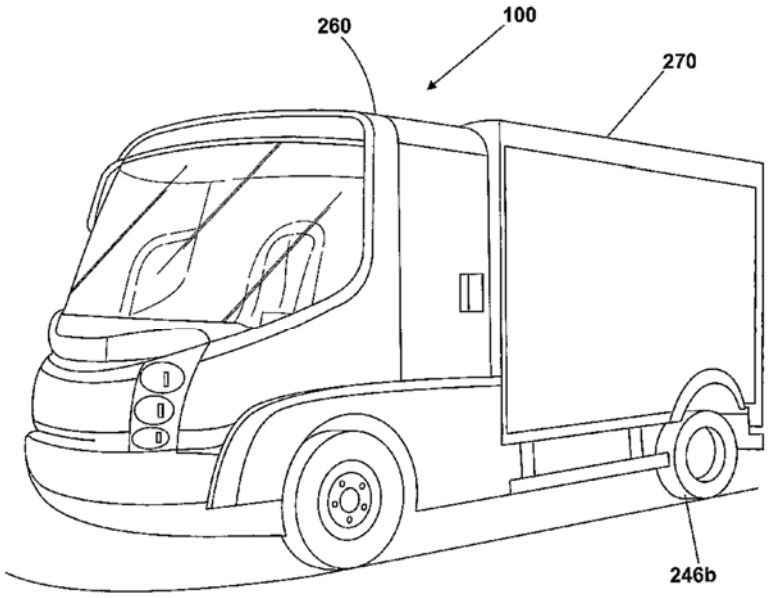


Fig. 1

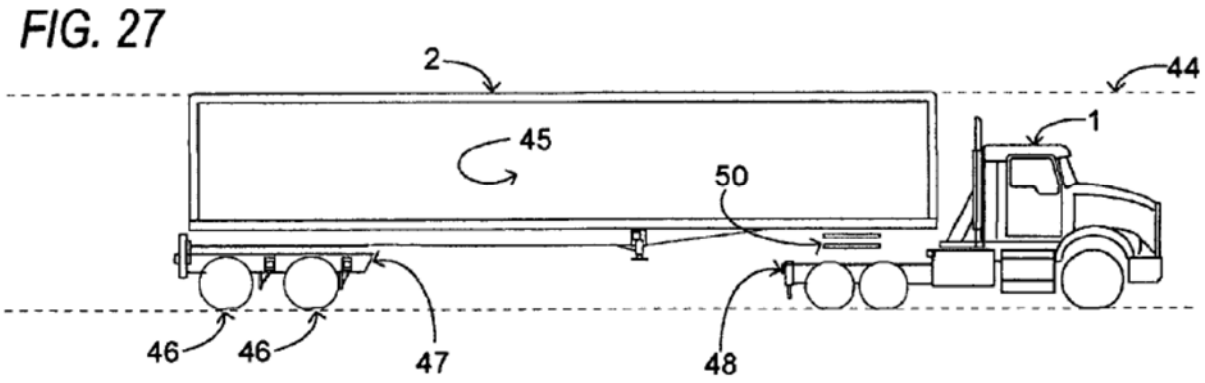
Ex. 1004, Fig. 1. Figure 1 graphically discloses the relative positioning of the door, seat, and front wheel well. While Figure 1 depicts a "specialist delivery vehicle," Modec expressly discloses the use of the disclosed door, seat, and wheel well alignment with ***any*** electric commercial vehicle. *Id.* at 14:30-15:2.

3. Messano

46. U.S. Patent No. 7,338,335 to Messano ("Messano," Ex. 1005) issued March 4, 2008. Ex. 1005, cover. I understand that Messano is prior art to the '084 patent.

47. Messano discloses a semi-truck with an electric drive train. Messano specifically discloses that "this present invention is for an electric vehicle which does not have a conventional driveline." Ex. 1005 at 4:10-11. Messano further discloses "Road-Wheel Modules provide the motive system for the vehicle and

vehicle trailers. A Road-Wheel Module consists of an electric drive motor." *Id*. at 4:26-28. Messano expressly discloses the use of the disclosed electric drive train with a "semi-truck vehicle," as depicted by Figure 27 of Messano, reproduced below:



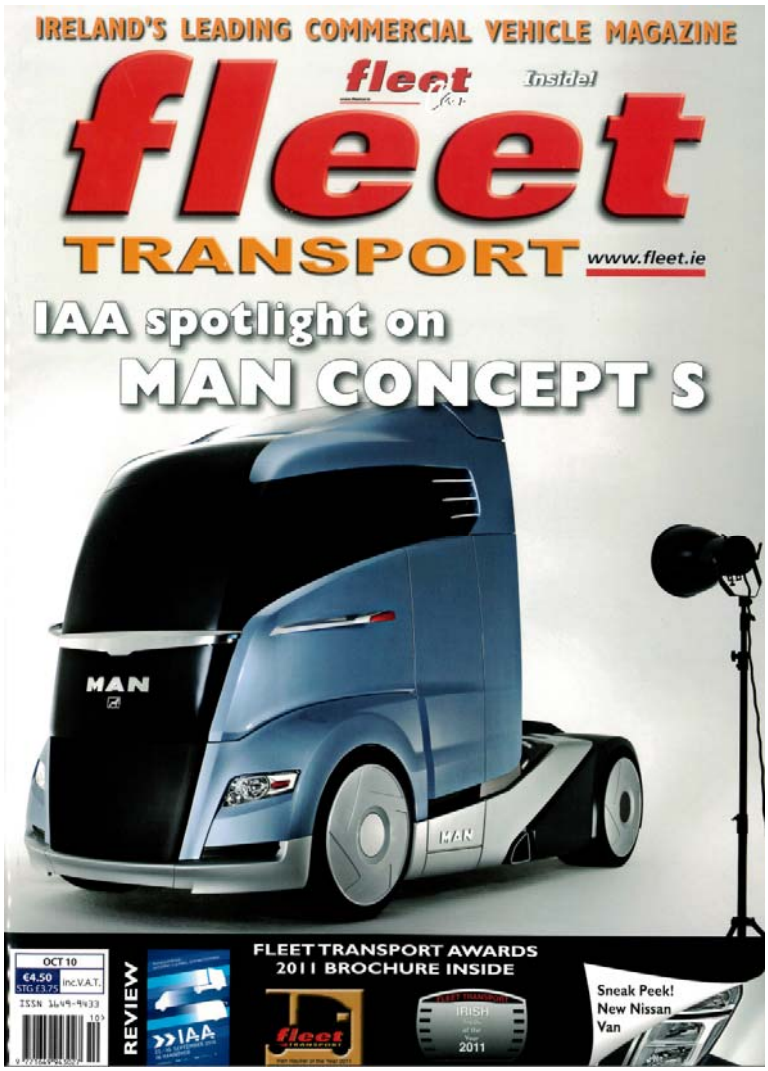
Id., Fig. 27. In addition, Messano establishes that it was well known to use an electric drive train with a wide variety of vehicles, including "heavy-duty long-haul vehicles" and "medium and light duty vehicles (trucks, buses, vans, SUVs, recreational vehicles, and the like)." *Id*., Abstract.

4. Fleet Transport

48. Exhibit 1006 is a true and correct copy of portions of the October 2010 issue of *Fleet Transport* magazine. I am familiar with *Fleet Transport* magazine based on my approximately 40 years of experience in the field of automotive design. *Fleet Transport* magazine is a reputable magazine within the trucking industry that was, during the relevant time, reliably published and made publicly accessible to subscribers and other interested members of the public in the

month of the issue indicated on the cover. The cover of Exhibit 1006 includes commercial markings, including the date "Oct 10," an International Standard Serial Number ("ISSN"), and a price that includes a Value Added Tax ("V.A.T."), that, in my view, are reliable indicators that Exhibit 1006 is, in fact, the October 2010 issue of *Fleet Transport* magazine that was published and made publicly accessible to subscribers and other interested members of the public in October 2010. I understand that it is the regular practice of publishers to make such markings at the time of publication during the course of the regular conduct of the activity of publication. Therefore, I conclude that Exhibit 1006 ("Fleet Transport") was published in October 2010 and, thus, I understand that Fleet Transport is prior art to the '084 patent. In addition, Fleet Transport is a well-respected periodical that is a reliable authority within the relevant field. Further, the information included in Fleet Transport is consistent with my own understanding of what was well known at least as early as October 2010. Accordingly, I relied on Fleet Transport to inform my understanding of what was known to a person of ordinary skill in the art at the relevant time.

49. Fleet Transport graphically discloses a semi-truck with the frontmost side of its frontmost door adjacent to and behind the rearmost portion of the front wheel well, as shown below:



Ex. 1006 at 1. While the picture does not show the seat, the customary and obvious placement of a seat in a semi-truck is near the front of the windshield. That would put at least part of the seat in front of the rearmost portion of the front wheel well and would put at least a portion of the door behind the seat.

5. Future Truck Report

50. Exhibit 1007 is a true and correct copy of a report entitled "Future Truck Committee Information Report: 2001-2, *Innovation in Future Truck Cab*

Designs: An Exploration of New Possibilities" was published in March 2001 by The Maintenance Council of the American Trucking Associations. I am familiar with the American Trucking Associations based on my approximately 40 years of experience in the field of automotive design. Exhibit 1007 is an authentic and official report of a council of the well-respected American Trucking Associations that was intended "to provoke discussion and encourage innovation." The report includes numerous findings and suggestions about truck design that would fulfill the stated purpose of the American Trucking Associations only if the report were published and made accessible to the relevant public. The report includes the marking "Issued: March 2001" and a 2001 copyright notice, together with other markings that, in my view, show that those date markings are reliable indicators that Exhibit 1007 was issued and made accessible to the relevant members of the public in March 2001. I understand that it is the regular practice of publishers to make such markings at the time of publication during the course of the regular conduct of the activity of publication. Therefore, I conclude that Exhibit 1007 ("Future Truck Report") was published in March 2001 and, thus, I understand that the Future Truck Report is prior art to the '084 patent. In addition, the Future Truck Report is a report by a well-respected industry association that is a reliable authority in the relevant field. Further, the information included in the Future Truck Report is consistent with my own understanding of what was known to a

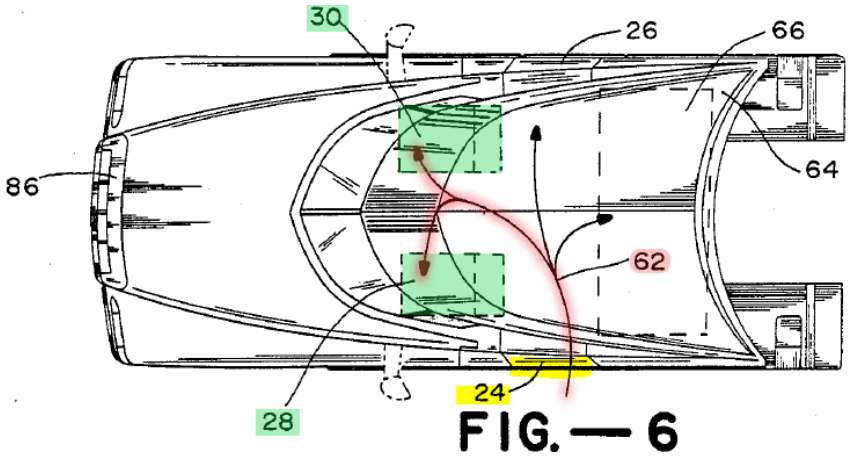
person of ordinary skill in the art at least as early as March 2001. Accordingly, I relied on the Future Truck Report to inform my understanding of what was known to a person of ordinary skill in the art at the relevant time.

51. The Future Truck Report discloses that the traditional location of semi-truck doors is ergonomically disadvantageous and unsafe, and causes a relatively high level of driver injuries caused by slips. Ex. 1007 at 2-4. The Future Truck Report also suggests that entry into the vehicle could be made easier and safer by positioning the door behind the seat to provide rear entry into the cabin and thus reducing driver injuries caused by slips. *Id.*

6. Marlowe

52. U.S. Patent No. 4,932,716 to Marlowe ("Marlowe," Ex. 1008) issued June 12, 1990. Ex. 1008, cover. I understand that Marlowe is prior art to the '084 patent.

53. Marlowe discloses a semi-truck with two seats, doors located behind the seats, a sleeper, and a cab layout that provides access though the cab door to both seats from behind and in between the seats, and to the sleeper, as shown below:



Ex. 1008, Fig. 6 (annotated).

7. Eltra

54. PCT Application Publication No. WO 81/01587 to Eltra Corporation ("Eltra," Ex. 1009) was published June 11, 1981. Ex. 1009, cover. I understand that Eltra is prior art to the '084 patent.

55. Eltra discloses a sliding door mounted on three tracks that includes components for opening and closing the door automatically upon initiation by an electrical switch. Ex. 1009 at 1:8-15; 4:12-25.

8. Racz

56. U.S. Patent Application Publication No. 2003/0006628 A1 to Racz ("Racz," Ex. 1010) was published January 9, 2003. Ex. 1010, cover. I understand that Racz is prior art to the '084 patent.

57. Racz discloses a semi-truck with a conventional hinged door. Ex. 1010 ¶ [0014].

9. Kia

58. Exhibit 1007 is a true and correct copy of the 2013 Kia Sedona User Manual ("Kia"). I am familiar with automotive manuals like Kia based on my approximately 40 years of experience in the field of automotive design, and my experience as an automobile owner. Kia was published at least by the end of 2013 because, as is well known, automobile user manuals are distributed to automobile purchasers as soon as the model is sold and are quickly thereafter available to the general public. Kia also includes a copyright date of 2011, indicating that the manual may have been publicly accessible even before the release of the 2013 Kia Sedona (which, according to standard automobile industry practice, would have been in late 2012). I understand that it is the regular practice of automobile manufacturers to affix date markings on user manuals at the time of publication during the course of the regular conduct of the activity of publication. Accordingly, I understand that Kia is prior art to the '084 patent. In addition, automobile user manuals including Kia are a well-respected source that is a reliable authority within the relevant field. Further, the information included in Kia is consistent with my own understanding of what was known to a person of ordinary skill in the art at least as early as 2013. Accordingly, I relied on Kia to inform my understanding of what was known to a person of ordinary skill in the art at the relevant time.

59. Kia discloses an "automatic stop and reversal" feature for a "power sliding door." Ex. 1011 at 35. Kia explains that this feature will detect resistance to the power sliding door and stop or reverse the closing of the door if a certain level of resistance is detected. *Id.*

10. Plummer

60. U.S. Patent No. 7,145,788 to Plummer ("Plummer," Ex. 1012) issued December 5, 2006. Ex. 1012, cover. I understand that Plummer is prior art to the '084 patent.

61. Plummer discloses a semi-truck including a conventional sleeper unit 142, as shown below:

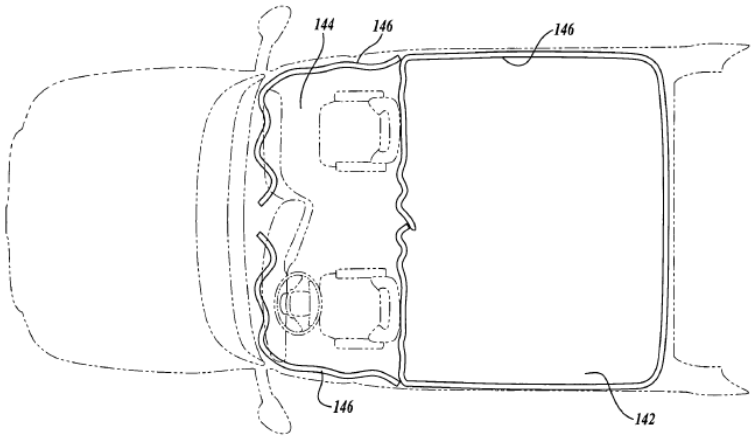


Fig.5.

Ex. 1012, Fig. 5. Plummer also discloses that long-haul trucks are equipped with "hotel loads" including "heating and air conditioning, lighting, and appliances such as refrigerators, coffee makers and microwave ovens." *Id*. at 1:15-22.

11. Man Annual Report

62. Exhibit 1013 is a true and correct copy of an authentic and official annual report publicly filed by the Man Group in 2012. Exhibit 1013 includes indicia and commercial markings that, in my view, reliably indicate that the Man Group publicly filed the report, and, thus, that it was accessible to relevant members of the public, in 2012. *See, e.g.*, Ex. 1013 at 1 ("2012 Annual Report" marking and Man logo). I understand that it is the regular practice of public companies to include such markings at the time of publication (through filing) during the course of the regular conduct of their businesses and the specific activity of filing their annual reports. I also understand that securities laws require annual reports such as the Man Annual Report to be publicly filed. Therefore, I conclude that Exhibit 1013 ("Man Annual Report") was published in 2012 and, thus, I understand that the Man Annual Report is prior art to the '084 patent. In addition, security filings of public companies within the relevant field, such as the Man Annual Report, are reliable authorities within the relevant field. Further, the information included in the Man Annual Report is consistent with my own understanding of what was known to a person of ordinary skill in the art at least as early as 2012. Accordingly, I relied on the Man Annual Report to inform my understanding of what was known to a person of ordinary skill in the art at the relevant time.

63. The Man Annual Report includes pictures of a semi-truck vehicle with a door that is taller than two people pictured near the truck:

Ex. 1013 at 8.

12. <u>Freightliner</u>

64. Exhibit 1014 is a true and correct copy of an article entitled "Ergonomics Program at Freightliner" by Josef Loczi, published in SAE Transactions in 2000 or 2001. I am familiar with SAE Transactions based on my approximately 40 years of experience in the field of automotive design. SAE

Transactions is a well-respected journal of the Society of Automotive Engineers that was, during the relevant time, reliably published and made accessible to the relevant public near the date indicated on each issue. Exhibit 1014 includes indications that the article was published in 2000 or 2001, including a 2000 copyright notice on the article and 2001 copyright notice and International Standard Serial Numbers ("ISSNs") near the front of the journal in which the article is contained. Ex. 1014 at 2, 10. I understand that it is the regular practice of publishers to make such markings at the time of publication during the course of the regular conduct of the activity of publication. Further, a website maintained by JSTOR, which is known to maintain reliable information about the publication of articles in the regular course of its activities, lists the article as being part of Vol. 109, Section 2: JOURNAL OF COMMERCIAL VEHICLES (2000), pp. 462-469. Exhibit 1018 is a true and correct copy of a printout from the JSTOR webpage, located at https://www.jstor.org/stable/44650780, which provides that listing. That webpage currently provides access to images that appear to be the same as pages 10-17 of Exhibit 1014. Exhibit 1019 is a true and correct copy of those images currently accessible from the JSTOR website. Therefore, I conclude that Exhibit 1014 ("Freightliner") was published in 2000 or 2001 and, thus, I understand that Freightliner is prior art to the '084 patent. In addition, SAE Transactions is a well-respected journal that is a reliable authority within the relevant field. Further, the

information included in Freightliner is consistent with my own understanding of what was known to a person of ordinary skill in the art as early as 2000 or 2001. Accordingly, I relied on Freightliner to inform my understanding of what was known to a person of ordinary skill in the art at the relevant time.

65. Freightliner discloses multiple steps and hand holds for assisting a driver to enter the cabin of a semi-truck, as shown below:

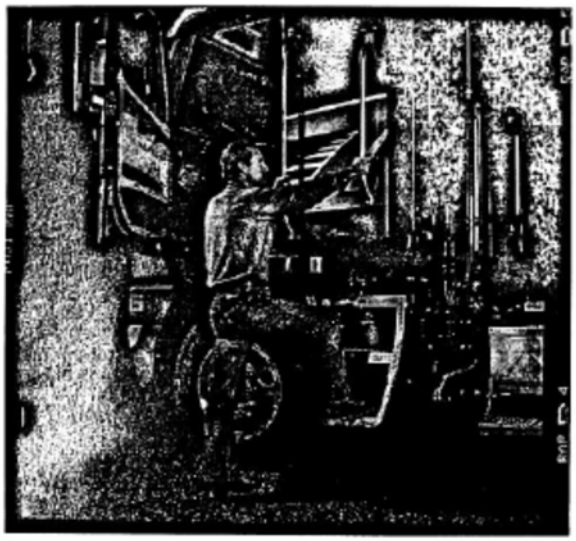


Figure 13. Driver Entering the Argosy Cab with Traditional Steps

Ex. 1014 at 14. Below is the same figure from the image of the same page currently accessible at the JSTOR website:

Figure 13. Driver Entering the Argosy Cab with Traditional Steps

Ex. 1019 at 5.

B. Ground 1: Claims 1-5, 15-16, and 25 would have been obvious over Modec and Messano

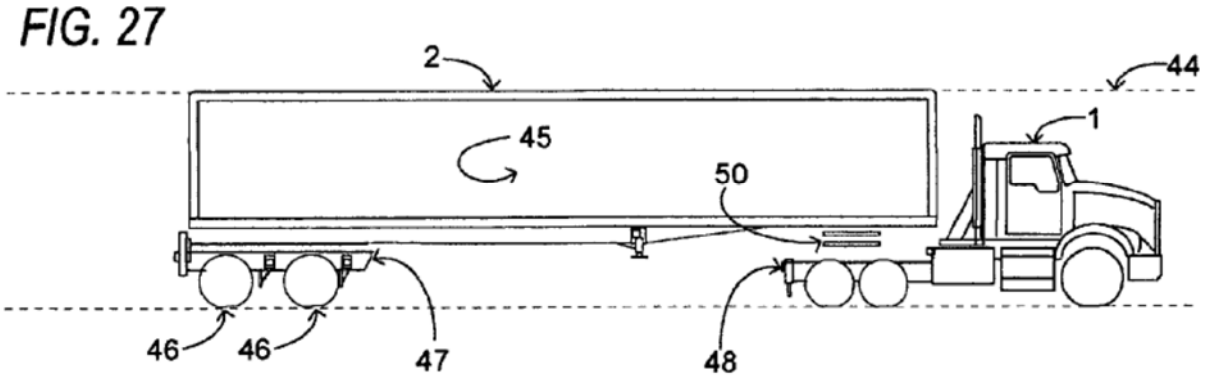
66. For the reasons set forth below, it is my opinion that claims 1-5, 15-16, and 25 of the '084 patent would have been obvious over Modec and Messano.

1. Claim 1

a. "A semi-truck vehicle"

67. Modec discloses an "electric vehicle 100" that can be a "specialist delivery vehicle" or "a box van or minibus or any other commercial or domestic use vehicle." Ex. 1004 at 14:30-15:2. While Modec does not specifically mention a "semi-truck vehicle," it would have been obvious to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle," as explained below in Section VII(B)(1)(k).

68. In the same field, Messano discloses an electric vehicle that is a "semi-truck vehicle." Figure 27 of Messano, reproduced below, illustrates "a tractor truck and semi-trailer." Ex. 1005 at 7:18-19.



b. "an electric drive train"

69. Modec discloses an "electric vehicle 100," shown in Figure 1, reproduced below.

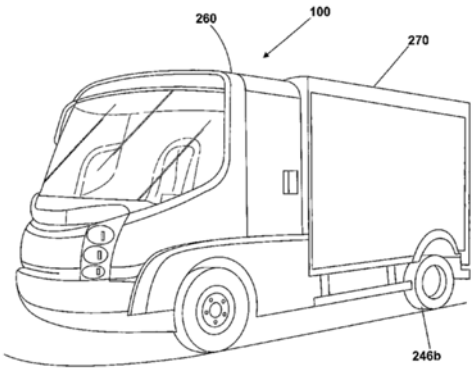


Fig. 1

Ex. 1004 at 14:30; Fig. 1. Modec further discloses: "At [the electric vehicle's] heart is an electric drive train including an electric motor 200 which is supplied with power from a battery assembly 210." *Id.* at 15:2-4. Modec also discloses that

the invention relates, in particular, "to electric vehicles and to control and security systems that may be fitted to such vehicles," and further explains that "electric powered vehicles . . . use electrical power sources and electric motors as the heart of their drive train." *Id*. at 1:7-8, 17-18.

70. Messano also discloses an electric drive train. Messano specifically discloses that "this present invention is for an electric vehicle which does not have a conventional driveline." Ex. 1005 at 4:10-11. Messano further discloses "Road-Wheel Modules provide the motive system for the vehicle and vehicle trailers. A Road-Wheel Module consists of an electric drive motor." *Id*. at 4:26-28. The presence of a combustion engine in at least one embodiment of Messano is irrelevant to the "electric drive train" limitation. Because that limitation refers to the drive train only, it does not require the absence of a combustion engine. In fact, dependent claim 3 of the '084 patent expressly recites "wherein the semi-truck vehicle comprises a combustion engine," thereby establishing that claim 1 may include a combustion engine in addition to "an electric drive train."

c. "a body"

71. As would be understood by a person of ordinary skill in the art, all vehicles have "a body." A skilled artisan would understand that Figure 1 of Modec, reproduced below, illustrates "a body."

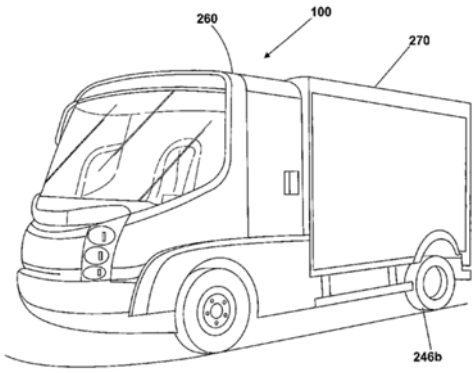
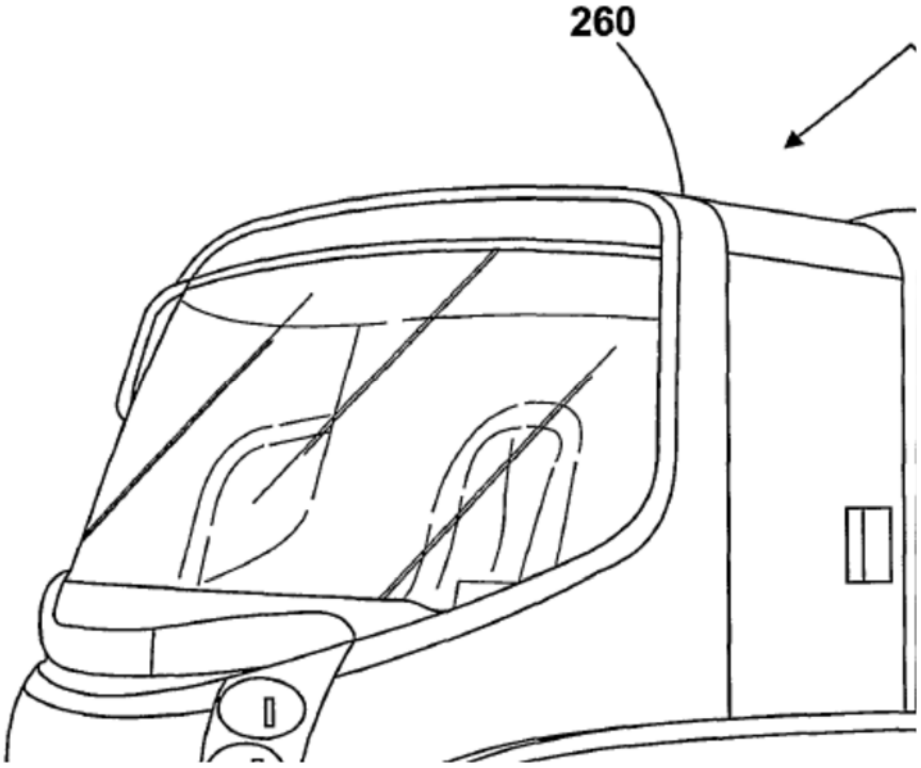


Fig. 1

Ex. 1004, Fig. 1. Modec's text also expressly discloses "a body." For example, Modec discloses that electrical pins may "be grounded by connecting them to the ***body or chassis*** of the vehicle." *Id.* at 12:13-14 (emphasis added). Modec also discloses: "The vehicle in this example is a specialist delivery vehicle, but through a simple change to the ***vehicle body*** it could be . . . ." *Id.* at 14:30-15:1 (emphasis added).

d. "a cabin located within the body of the semi-truck vehicle, wherein the cabin comprises an interior that is configured to accommodate at least one person"

72. Modec discloses: "At the front, the ***chassis*** carries a ***cab*** 260 in which the ***driver sits*** and which is protected by a lockable door. As shown the cab has a ***driver*** and ***passenger seat*** (not shown)." *Id.* at 15:29-31 (emphases added). As shown by the following blown-up portion, Figure 1 illustrates the cab 260:



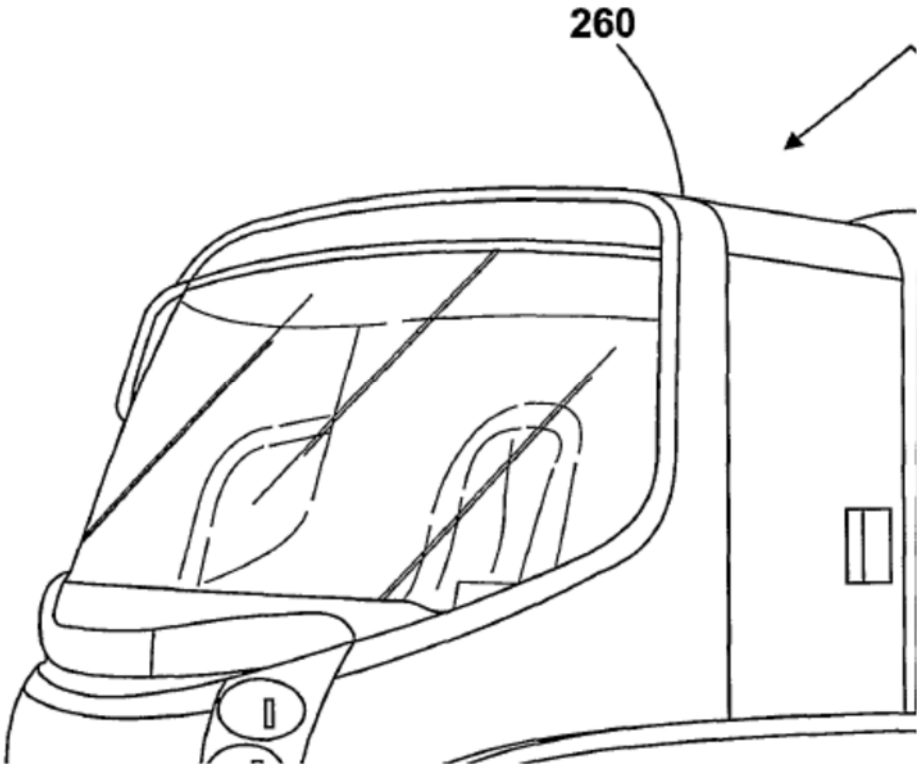
Id., Fig. 1. Modec further discloses that a cooling system "keeps the ***cabin*** at a comfortable ambient temperature." *Id*. at 15:23-24 (emphasis added). A person of ordinary skill in the art would understand that the terms "cab" and "cabin" are used interchangeably in the art and in Modec's disclosure.

73. Figure 1 and the text of Modec establish that the cab 260 or cabin is "located within the body." Further, Figure 1 and Modec's disclosure that the driver sits in the cab and that the cab has a driver seat and a passenger seat establish that "the cabin comprises an interior that is configured to accommodate at least one person."

74. As explained below in Section VII(B)(1)(k), it would have been obvious to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle."

e. <u>"a seat located in the interior of the cabin that is configured for seating a user"</u>

75. Modec discloses: "At the front, the chassis carries a cab 260 in which the ***driver sits*** and which is protected by a lockable door. As shown the cab has a ***driver*** and ***passenger seat*** (not shown)." *Id.* at 15:29-31 (emphases added). Figure 1 shows that the seats are "located in the interior of the cabin."



Id., Fig. 1. Further, a person of ordinary skill in the art would understand that each of the disclosed driver seat and passenger seat is "configured for seating a user."

In fact, Modec's express disclosure that the "driver sits" establishes that the driver seat "is configured for seating a user."

f. "a door comprising a width extending a horizontal length of the door, wherein the door provides ingress and egress to the interior of the cabin of the semi-truck vehicle"

76. Modec discloses: "At the front, the chassis carries a cab 260 in which the driver sits and which is protected by a lockable ***door***." *Id.* at 15:29-31 (emphasis added). The annotated blown-up portion of Figure 1, below, shows the disclosed door in yellow.

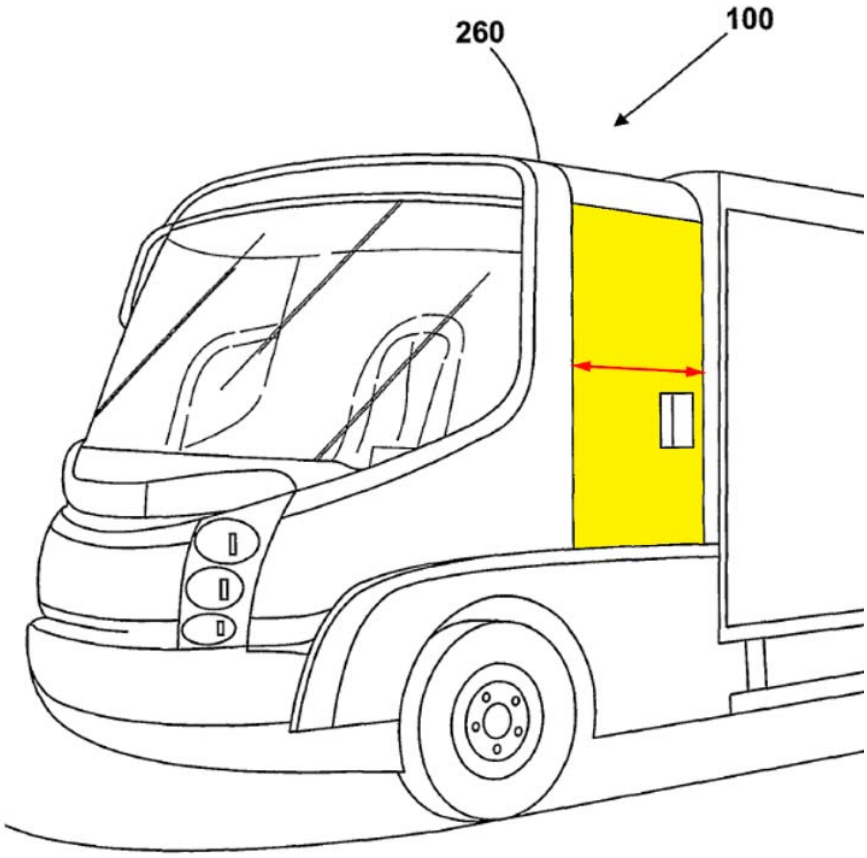


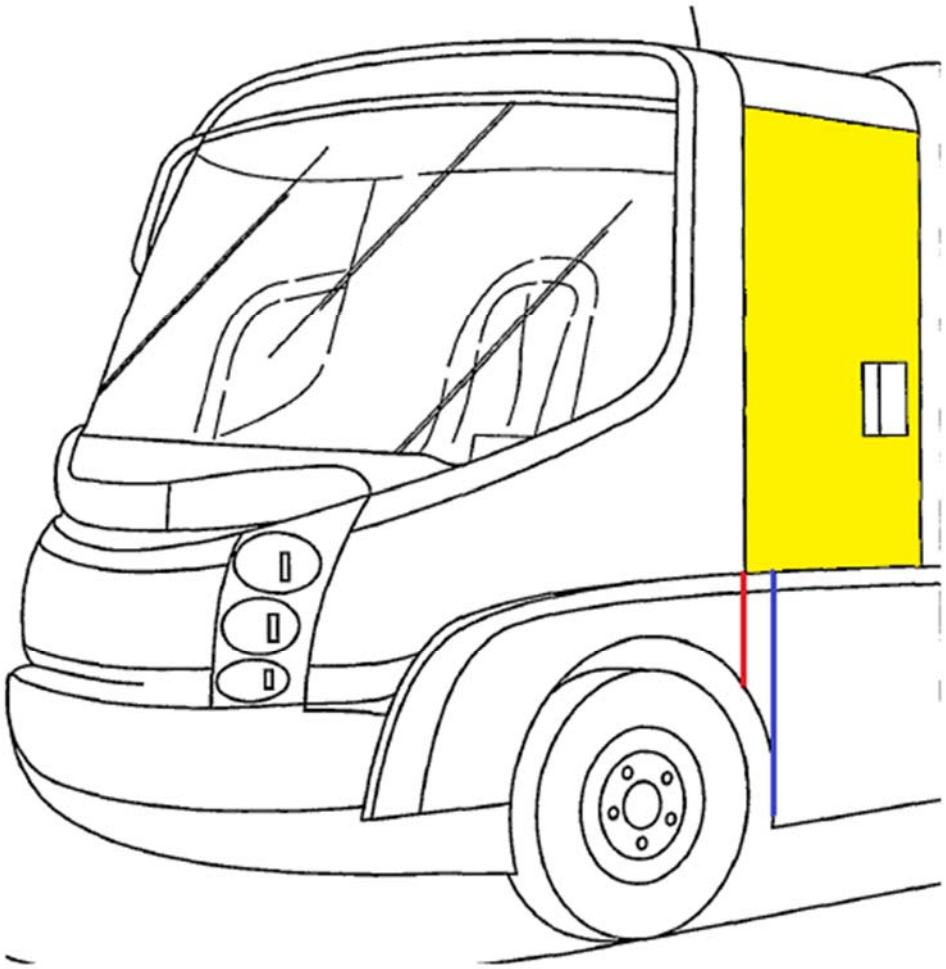
Fig. 1

Id., Fig. 1. The red line on the annotated figure shows that the door comprises "a width extending a horizontal length of the door." Modec further discloses that the door can be unlocked "to allow the driver to access the vehicle through the door" (*id.* at 22:18-20), thereby establishing that "the door provides ingress and egress to the interior of the cabin."

77. As explained below in Section VII(B)(1)(k), it would have been obvious to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle."

g. "wherein the door is located on the body such that the frontmost side of the door is adjacent to a rearmost portion of a front wheel well"

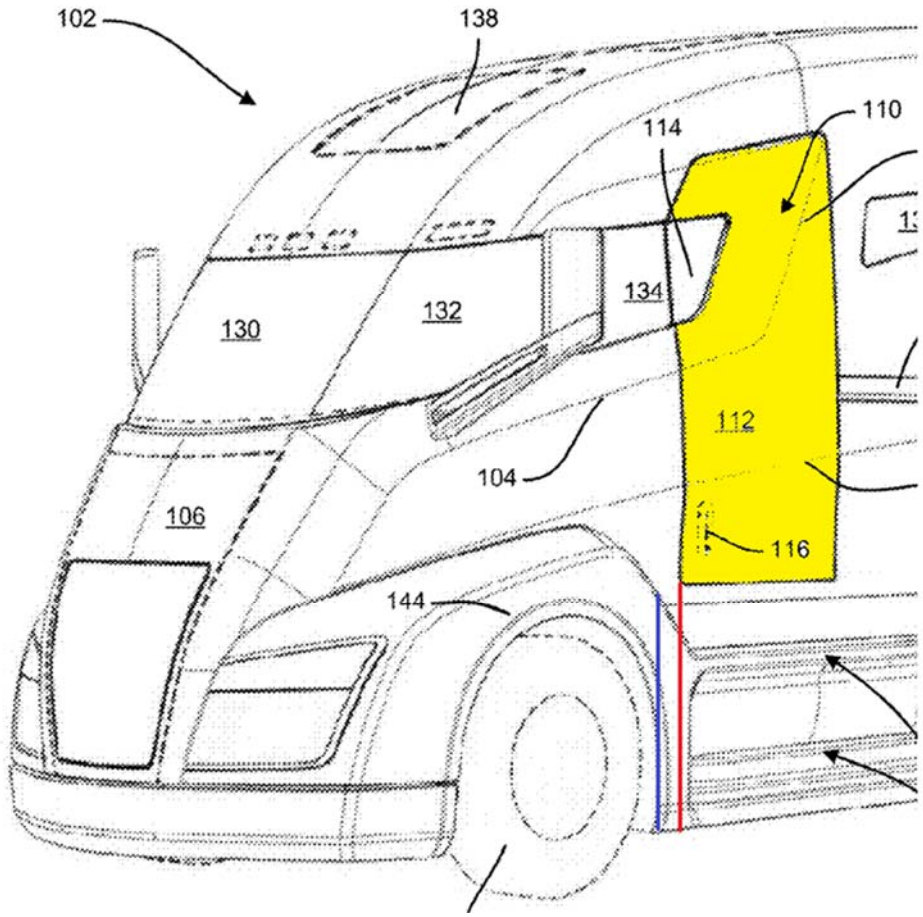
78. The following annotated blown-up portion of Figure 1 of Modec shows that "the door [yellow] is located on the body such that the frontmost side of the door [red line extended from frontmost edge] is adjacent to a rearmost portion of a front wheel well [blue line extended from rearmost edge]."



As explained above in Section V(A)(1), "adjacent to" means "nearby but not touching." The red and blue lines in the annotated figure above show a very small gap between the frontmost side of the door and the rearmost portion of the front wheel well in Modec, and, thus, those components are "nearby but not touching" or "adjacent to" each other.

79. Indeed, the position of the door relative to the front wheel well in Modec is almost identical to the position of those same components in the '084

patent, as shown by the following annotated blown-up portion of Figure 1 of the '084 patent.



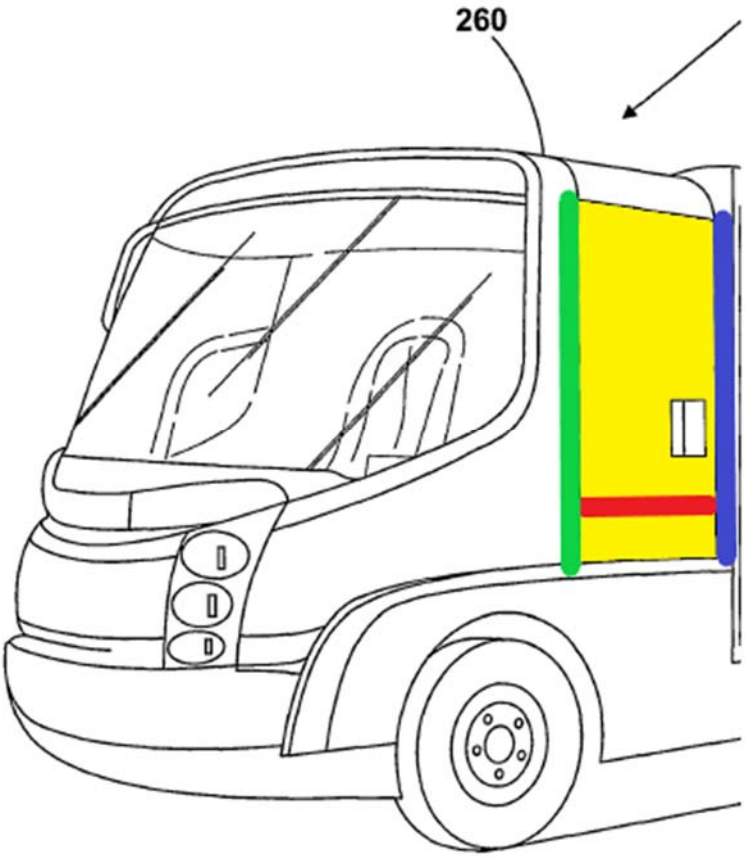
As explained above, the claim term "adjacent to" does not require the frontmost side of the door to be located horizontally behind the rearmost portion of the wheel well, or *vice-versa*. The "adjacent to" limitation is satisfied as long as those two components are "nearby but not touching," without regard to whether the frontmost side of the door or the rearmost portion of the wheel well is in the forward-most horizontal position. Accordingly, it is irrelevant that Figure 1 of the '084 patent depicts the frontmost side of the door located horizontally behind the

rearmost portion of the wheel well, while Figure 1 of Modec shows the frontmost side of the door located horizontally in front of the rearmost portion of the wheel well.

80. Moreover, even if the "adjacent to" limitation required the frontmost side of the door to be located horizontally behind the rearmost portion of the wheel well, the relative horizontal positioning of those two components would have been a matter of obvious design choice. A person of ordinary skill in the art would understand that, as long as a sufficient portion of the door is located behind the wheel well to enable a person to enter the truck without climbing over the wheel well, there is no significant functional difference between locating the door entirely behind the wheel well and locating a small portion of the door slightly in front of the rearmost portion of the wheel well. Accordingly, a person of ordinary skill in the art would be motivated to locate the door entirely behind the wheel well when an elongated cabin is desired and to locate a portion of the door in front of the rearmost portion of the wheel well when a more condensed cabin is desired. Because semi-trucks generally have relatively elongated cabins, it would have been an obvious design choice to move Modec's door back slightly to locate the frontmost side of the door horizontally behind the rearmost portion of the wheel well.

h. <u>"and the width of the door is disposed between the frontmost side of the door and a rearmost side of the door"</u>

81. The annotated blown-up portion of Figure 1, below, shows that "the width [red] of the door [yellow] is disposed between the frontmost side [green] of the door and the rearmost side [blue] of the door."



Id., Fig. 1.

i. <u>"at least a portion of the door being positioned behind the seat and at least a portion of the seat is disposed to be forward of a line defining the rearmost portion of the front wheel well such that the door opens to provide ingress and egress into the cabin from a backside of the seat"</u>

82. The following annotated Figure 1 of Modec shows that "at least a portion of the door [yellow]" is "positioned behind the seat [green] and at least a portion of the seat [green] is disposed to be forward of a line defining the rearmost portion of the wheel well [blue line extended from rearmost edge]."

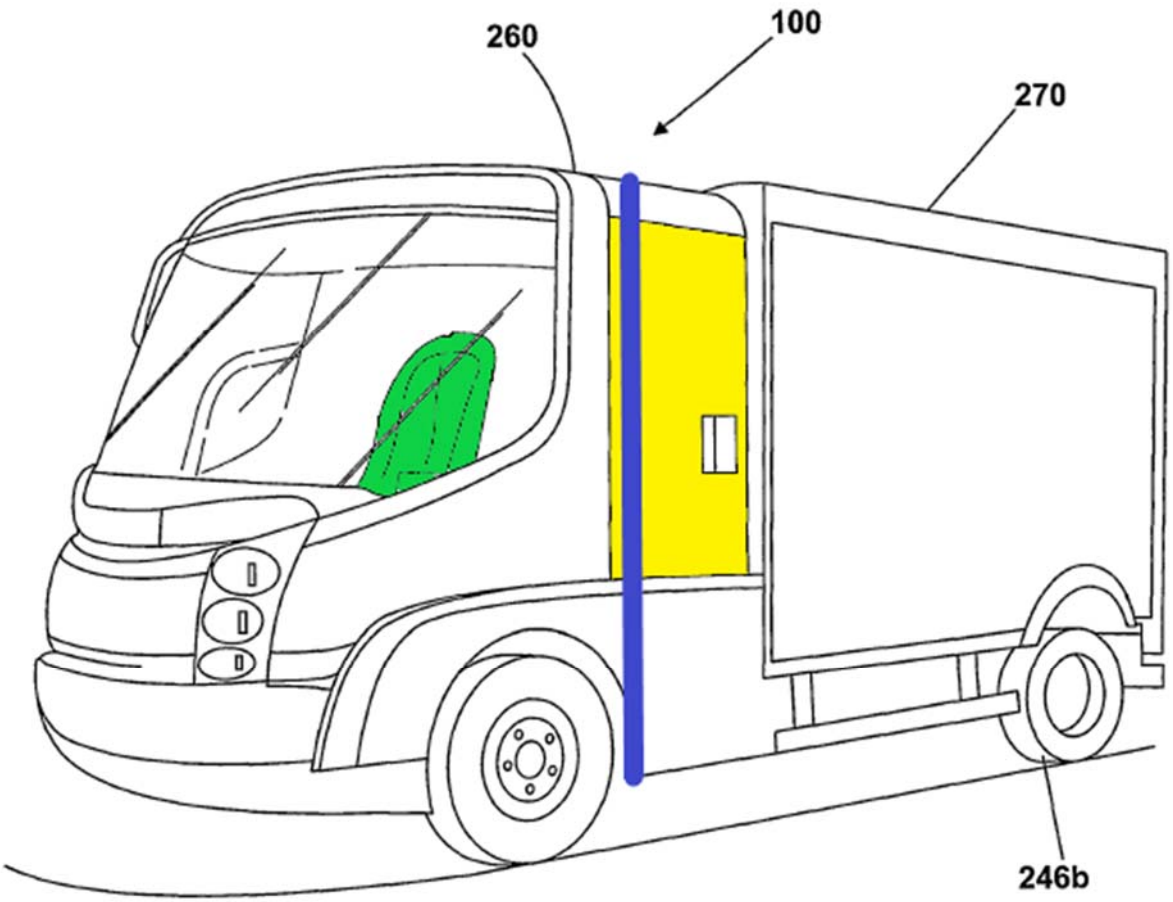


Fig. 1

83. Modec further discloses that the door can be unlocked "to allow the driver to access the vehicle through the door" (*id.* at 22:18-20), thereby establishing that "the door opens to provide ingress and egress into the cabin." As explained above, the door is positioned behind the seat. Therefore, ingress and egress into the cabin, as provided by the door, can only be "from a backside of the seat."

j. <u>"wherein the door is the foremost door providing ingress or egress into the interior of the cabin."</u>

84. The following annotated Figure 1 of Modec shows that "the door [yellow] is the foremost door." Modec further discloses that the door can be unlocked "to allow the driver to access the vehicle through the door" (*id.* at 22:18-20), thereby establishing that the door is "providing ingress or egress into the interior of the cabin."

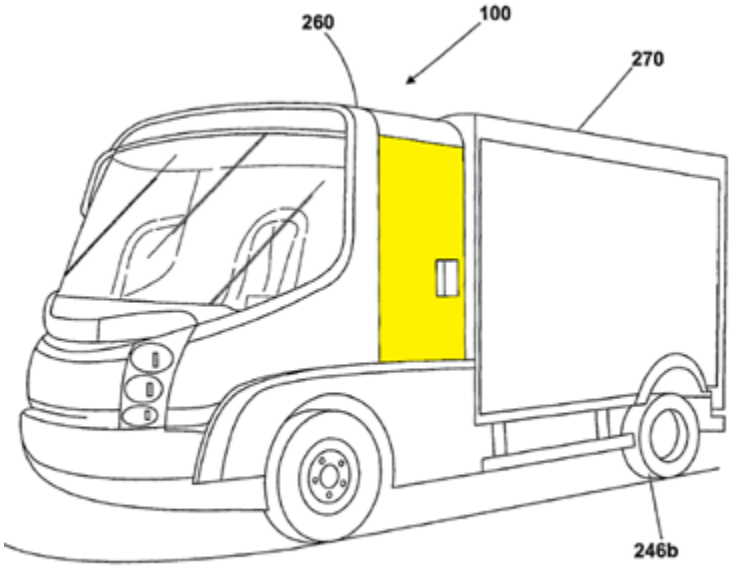


Fig. 1

k. A person of ordinary skill in the art would have found it obvious, and would have been motivated, to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle."

85. As set forth above, claim 1 of the '084 patent may differ from Modec because Modec does not expressly identify its "electric vehicle 100" as a "semi-truck vehicle." This is not a patentable distinction, however, because a person of ordinary skill in the art at the time of the alleged invention would have found it obvious to use Modec's disclosed positioning of the door, seat, and front wheel well with a "semi-truck vehicle."

86. It would have been obvious to use Modec with a "semi-truck vehicle" in view of Modec alone. Figure 1 of Modec depicts "a specialist delivery vehicle." *Id.* at 14:30-31. However, Modec discloses that "through a ***simple change*** to the vehicle body," the vehicle could be a box van or minibus or ***any other commercial*** or domestic use ***vehicle***." *Id.* at 14:30-15:2 (emphases added). A person of ordinary skill in the art would understand that a "semi-truck vehicle" is a "commercial vehicle," and, thus, that "a simple change to the vehicle body" would adapt the configuration shown for Modec for use with a "semi-truck vehicle." Moreover, even if a person of ordinary skill in the art did not consider a "semi-truck vehicle" to be the type of "commercial vehicle" contemplated by Modec, the express teaching that a simple change to the vehicle body would adapt Modec for

use with other vehicle types would motivate a person of ordinary skill in the art to consider other vehicle types, even beyond those expressly disclosed, with which Modec's relative positioning of the door, seat, and front wheel well could be used advantageously.

87. Further, even if it were not obvious to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle" in view of Modec alone, it would have been obvious to do so in view of Modec in combination with Messano. Modec expressly discloses that "a simple change to the vehicle body" would adapt Modec for use with other vehicle types. Within the same field of electric vehicles, Messano expressly discloses that an electric drive train can be used with a wide variety of vehicles, including "heavy-duty long-haul vehicles" and "medium and light duty vehicles (trucks, buses, vans, SUVs, recreational vehicles, and the like)." *Id*., Abstract. Those disclosures would motivate a person of ordinary skill in the art to consider "semi-truck vehicles" to be among vehicle types with which Modec's relative positioning of the door, seat, and front wheel well could be used advantageously.

88. A person of ordinary skill in the art would also be motivated by the understanding that Modec's relative positioning would be advantageous for a "semi-truck vehicle" because it would allow a driver to more easily and safely enter and exit the "semi-truck vehicle." The person of ordinary skill in the art

would be well aware of this advantage for at least three reasons. First, a person of ordinary skill in the art would have personal knowledge, based on experience using or testing the different door, seat, and wheel well positions in the prior art, that it is easier and requires less dangerous movement to enter the cabin of a vehicle in which the relative positioning of the door, seat, and front wheel well allows for entry into the cabin from behind the seat rather than requiring climbing directly into the seat. Second, a person of ordinary skill in the art would be aware of the express teaching of the 2001 American Trucking Associations report that positioning the door behind the seat to provide rear entry into the cabin would make entry into the vehicle easier and increase safety by reducing driver injuries caused by slips. Ex. 1007 at 2-4. Third, a person of ordinary skill in the art would be aware of the general knowledge within the industry, as shown by Applicants' admission in the background section of the '084 patent, that climbing directly into a semi-truck seat, as required by the traditional positioning of the door, seat, and front wheel well, may be uncomfortable and dangerous.

89. A person of ordinary skill in the art would be even more motivated to use the relative positioning of the door, seat, and front wheel well disclosed by Modec for a "semi-truck vehicle" than for smaller vehicles like delivery trucks or vans. The reason for this enhanced motivation is that the advantages of increased comfort and safety are even more significant for larger vehicles such as "semi-

trucks" because the need to climb directly up into the seat is more of an inconvenience and danger for a larger vehicle than for a smaller vehicle.

90. Finally, a person of ordinary skill in the art would have an expectation of success in modifying Modec for use with a "semi-truck vehicle." A person of ordinary skill in the art would understand that Modec's relative positioning of the door, seat, and front wheel well is a simple layout choice that could easily be implemented for any type of vehicle regardless of size or other physical differences. A person of ordinary skill in the art would further understand that nothing beyond mere resizing of the various cabin components would be necessary to modify Modec for use with "a semi-truck vehicle" and that there would be no technical or other obstacles to making that modification.

91. In summary, modifying Modec to use its disclosed relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle" would meet every claim limitation, a person of ordinary skill in the art would have had a motivation or reason to make the modification, and a person of ordinary skill in the art would have expected success and not encountered any technical or other obstacle to making the combination. Therefore, it would have been obvious to modify Modec for use with a "semi-truck vehicle." Because such modification would include every claim limitation, claim 1 would have been obvious.

2. Claim 2: "wherein the semi-truck vehicle is an electric vehicle comprising a battery pack that is coupled to an electric drive train."

92. Modec discloses: "At [the electric vehicle's] heart is an electric drive train including an electric motor 200 which is supplied with power from a battery assembly 210." Ex. 1004 at 15:2-4. Modec also discloses that: "The battery assembly 210 comprises a self contained unit that comprises 10 battery cells, battery control circuitry for regulating the battery charge and voltage, and a set of contactors which selectively connect the batteries to the units output terminals or isolate them." A person of ordinary skill in the art would understand that a "battery assembly" is a "battery pack," and, thus, Modec discloses "an electric vehicle comprising a battery pack that is coupled to an electric drive train."

93. Further, it would have been obvious to a person of ordinary skill in the art to couple the electric drive train of Claim 1 to a battery pack in view of Modec in combination with Messano. Messano discloses a "Battery Module" which "may consist of batteries, capacitors, or any combination thereof where electrical energy is stored." Ex. 1005 at 4:16-19. Messano discloses that the truck's "electric motors receive power from the Battery Modules and optionally from the GenSets." *Id*. at 4:33-35. A person of ordinary skill in the art would understand that the "Battery Modules" disclosed by Messano are "a battery pack that is coupled to an electric drive train."

94. Moreover, it would have been obvious to a person of ordinary skill in the art to couple the electric drive train of Claim 1 to a battery pack in order to provide power to the electric drive train. Therefore, claim 2 would have been obvious.

3. Claim 3: "wherein the semitruck vehicle comprises a combustion engine configured to generate power by using combustion energy of fuel and Claim 25: "wherein the semi-truck vehicle is a hybrid vehicle comprising electrical and combustion components."

95. Messano specifically claims "A hybrid semi-trailer truck system comprising: an electric drive road tractor that incorporates: a multiplicity of constant-speed internal combustion engines maximized for fuel efficiency." *Id*. at 19:28-31. Thus, Messano discloses "a combustion engine configured to generate power by using combustion energy of fuel" (claim 3) and "a hybrid vehicle comprising electrical and combustion components" (claim 25). Therefore, the combination of Modec and Messano meets every limitation of claim 3, and claim 3 would have been obvious.

4. Claim 4: "wherein the semitruck vehicle comprises only a single door."

96. The following annotated Figure 1 of Modec shows only a single door

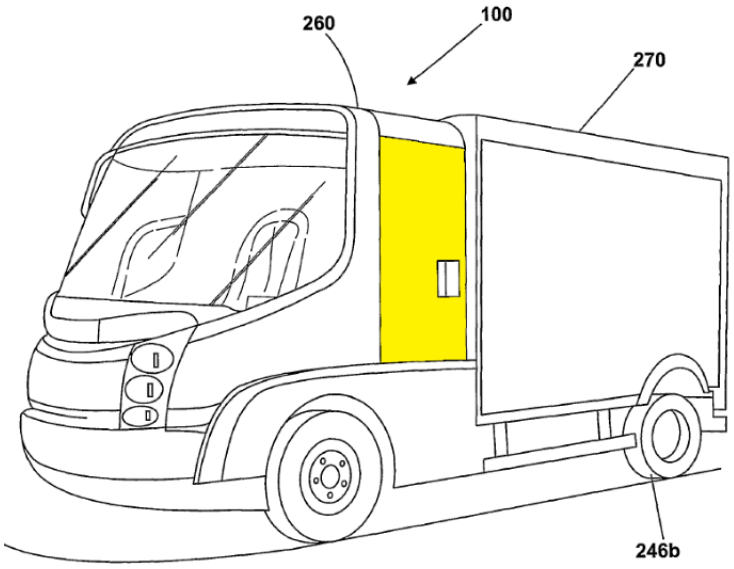


Fig. 1

(yellow).

97. Modec does not disclose the presence of additional doors. Thus, Modec discloses "only a single door." Even if Modec discloses an alternative embodiment of having two doors, it discloses the alternative of having "only a single door." Therefore, the combination of Modec and Messano meets every limitation of claim 4, and claim 4 would have been obvious.

5. Claim 5: "wherein the single door is located on a left side when the user is seated in the seat of the semi-truck vehicle."

98. As shown in the previous figure, Modec shows "a single door" (yellow) that is located on the left side of the truck when the user is seated in the

seat. Therefore, the combination of Modec and Messano meets every limitation of claim 5, and claim 5 would have been obvious.

6. Claim 15: "wherein the vehicle is an electric driven class 7 semi-truck."

99. As explained above, Messano discloses a "semi-truck vehicle" with an electric drive train. Messano further discloses that "[t]he drive system equally applies to light & medium duty Class 2 to 7 vehicles, motorhomes, amphibians, and automobiles." *Id*. at 1:41-43. Thus, Messano discloses a semi-truck vehicle "wherein the vehicle is an electric driven class 7 semi-truck." Therefore, the combination of Modec and Messano meets every limitation of claim 15, and claim 15 would have been obvious.

7. Claim 16: "wherein the vehicle is an electric driven class 8 semi-truck."

100. As explained above, Messano discloses a "semi-truck vehicle" with an electric drive train. Messano further discloses that "[t]he present invention relates […] more particularly, to a fuel efficient heavy-duty Class 8 long-haul vehicle." *Id*. at 1:33-36. Thus, Messano discloses a semi-truck vehicle "wherein the vehicle is an electric driven class 8 semi-truck." Therefore, the combination of Modec and Messano meets every limitation of claim 16, and claim 16 would have been obvious.

C. Ground 2: Claim 6 would have been obvious over Modec, Messano, and the Future Truck Report

101. Claim 6, which depends from claim 4 and recites the additional limitation "wherein the single door is located on the right side when the user is seated in the seat of the semi-truck vehicle," would have been obvious over either Modec and Messano or Modec, Messano, and the Future Truck Report. While Modec illustrates "a single door" (yellow in annotated Figure 1, shown previously) "located on the left side of the truck," it would have been obvious to one of ordinary skill in the art to instead locate the door on the right side, as an obvious matter of design choice. There are finite options for locating a single door, including, primarily, locating the door on the left side and locating the door on the right side, and a person of ordinary skill in the art would understand that either of those choices would successfully allow a person to enter and exit the truck. Further, a person of ordinary skill would have appreciated that locating the door on the right side would eliminate the need for the driver to enter and exit on the left side of the vehicle, which would eliminate the driver's exposure to passing road traffic during ingress and egress. A person of ordinary skill in the art would also have appreciated that a door on the driver's side weakens the cab structure and restricts the size of the driver's side window. Therefore, a cab design with no driver's side door increases the cab strength and would allow for a larger driver's side window, increasing safety and visibility. The Future Truck Report expressly

discloses the foregoing motivations for locating a single door on the right side. Thus, it would have been an obvious design choice to have a single door in the cab located on the right (passenger) side.

102. Even if not obvious in view of Modec and Messano alone, the Future Truck Report discloses a "single door located on the right side when the user is seated in the seat of the semi-truck vehicle," and it would have been obvious to combine Modec and Messano with the Future Truck Report. The Future Truck Report discloses that, "[e]ntry could be by a door at the right rear of the passenger side, eliminating the door on the driver's side" and explains that this position "would eliminate the need for retractable steps/stairs and for doors opening into traffic. For on-highway use there is little need for a driver to have ready entry and exit provided by a door on his immediate left." Ex. 1007 at 3. The Future Truck Report also explains that a door weakens the cab structure and restricts the cab window size. *Id*. A person of ordinary skill in the art would know to combine Modec and Messano with the Future Truck Report because the Future Truck Report explicitly suggests designers consider making the disclosed changes to conventional truck designs. For example, the Future Truck Report states that, "[t]he authors … advocate spirited debate and serious consideration of the value of these changes to cab design." *Id*. at 1.

D. Ground 3: Claims 7, 8, 21, and 26 would have been obvious over Modec, Messano, and Marlowe

1. Claim 7: "wherein the door of the semi-truck vehicle comprises a first door and a second door."

103. It would have been obvious to one of skill in the art to modify the cabin of Modec to have a first door and a second door. In fact, it is customary for semi-truck vehicles and other trucks to have at least two doors, a driver-side door and a passenger-side door. A person of ordinary skill in the art would recognize that it is advantageous to have at least two doors for convenience, to provide separate entryways for the driver and the passenger, and for safety, to provide multiple points of ingress and egress in case of an emergency.

104. Even if this limitation were not obvious in view of Modec and Messano alone, it would have been obvious in view of Modec, Messano, and Marlowe. Marlowe discloses a "class 7 or 8 truck," that includes a cab having driver and passenger doors." Exhibit 1008 at 1:6-10. A person of ordinary skill in the art would understand that a class 8 truck is "a semi-truck vehicle." Marlowe thus expressly discloses a "semi-truck vehicle [comprising] a first door and a second door," as shown by Figure 6 from Marlowe, reproduced below, which shows "opposite driver and passenger doors **24** and **26**, respectively." Ex. 1008 at 3:1-2; Figure 6. Accordingly, claim 7 would have been obvious.

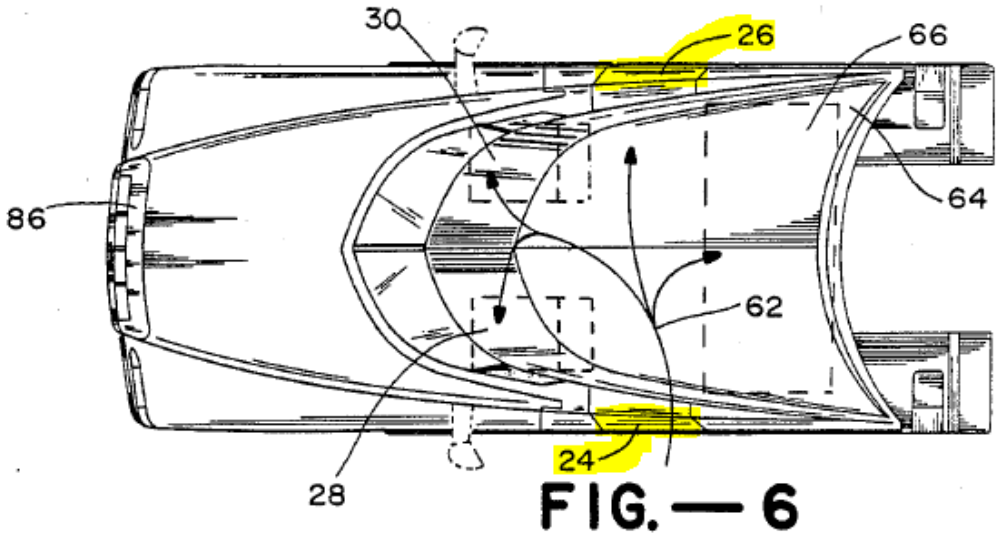


FIG. — 6

2. Claim 8: "wherein the first door is located on a left side when the user is seated in the seat of the semi-truck vehicle and the second door is located on a right side when the user is seated in the seat of the semi-truck vehicle."

105. It would have been obvious to one of skill in the art to modify the cabin of Modec to have a first door on the left side and a second door on the right side. Indeed, a person of ordinary skill in the art would recognize that as the customary cabin design for a semi-truck vehicle or other truck. A person of ordinary skill in the art would further recognize that it is advantageous to provide separate entryways for the driver and the passenger and to provide multiple points of ingress and egress.

106. Even if this limitation were not obvious in view of Modec and Messano alone, it would have been obvious in view of Modec, Messano, and Marlowe. Marlowe discloses a "class 7 or 8 truck," that includes a cab having

driver and passenger doors." Exhibit 1008 at 1:6-10. A person of ordinary skill in the art would understand that a class 8 truck is "a semi-truck vehicle." Figure 6 from Marlowe, reproduced below, shows "opposite driver and passenger doors **24** and **26** [in yellow], respectively." Ex. 1008 at 3:1-2; Figure 6. Figure 6 also shows "driver and passenger seats **28** [passenger seat outlined in blue] and **30**, respectively." *Id.*

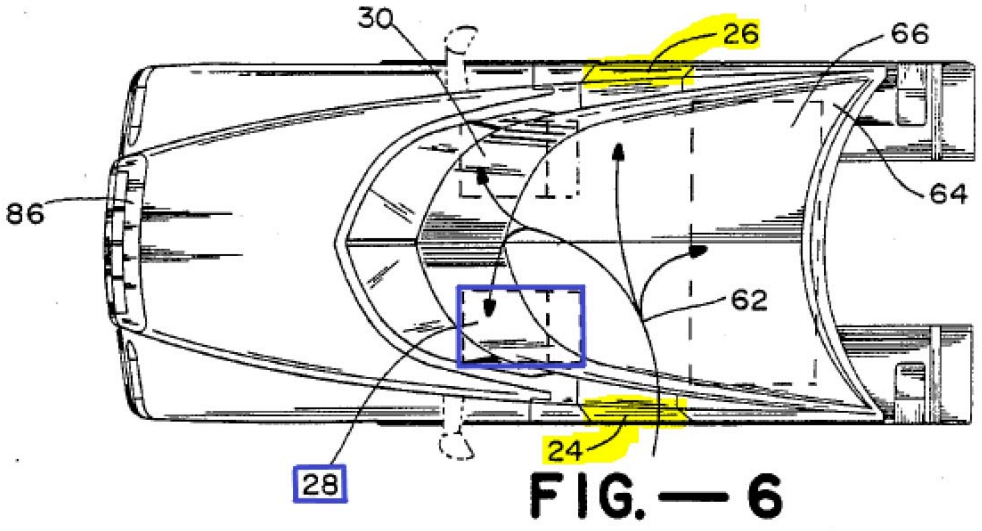


FIG. — 6

A person of ordinary skill in the art would understand that the driver seat is where "the user is seated in the seat of the semi-truck vehicle." As shown in Figure 6, the doors are to the left and right of the driver seat. Thus, Marlowe explicitly discloses the limitation of claim 8. Accordingly, claim 8 would have been obvious.

3. Claim 21

a. "wherein the cabin comprises a first seat and a second seat, and"

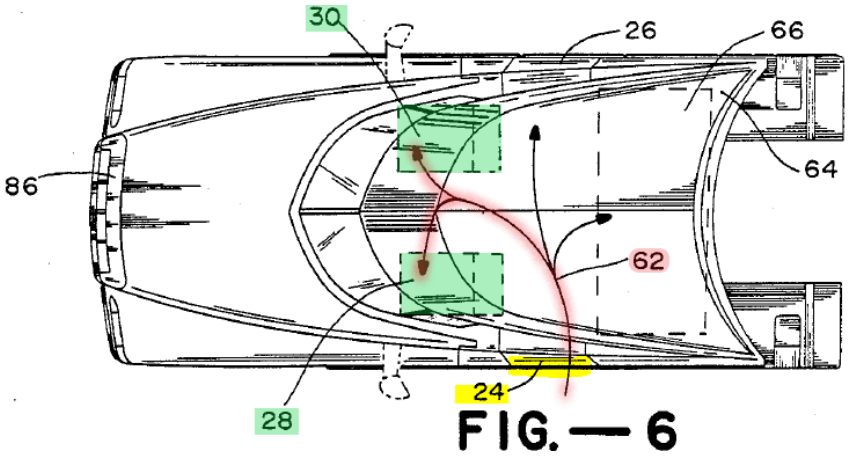
107. As described in Section VII(B)(1)(e), Modec discloses "a seat located in the interior of the cabin that is configured for seating a user." Thus, Modec discloses the "first seat" required by claim 21. Claim 21 also requires "a second seat" in addition to the "first seat." Modec discloses both "a driver and a passenger seat (not shown)." Ex. 1004 at 15:30-31. The "passenger seat" of Modec is the "second seat" required by claim 21.

b. "wherein access to either of the first seat or the second seat is provided between the second seat and the first seat."

108. It would have been obvious to a person of ordinary skill in the art to modify the cabin of Modec and Messano to comprise a first seat and a second seat wherein access to either of the first seat or the second seat is provided between the second seat and the first seat. A person of ordinary skill in the art would have known that if the cabin comprised two seats, and the door was located behind the seats, access to the seats would be provided between the first and second seat. Therefore, Claim 21 would have been obvious over Modec and Messano.

109. Even if it was not obvious over Modec and Messano alone, it would have been obvious to a person of ordinary skill in the art to modify the cabin of Modec and Messano to comprise a first seat and a second seat, wherein access to

either of the first seat or the second seat is provided between the second seat and the first seat, as disclosed in Marlowe. Figure 6 of Marlowe, reproduced below, shows "driver and passenger seats 28 and 30 [green], respectively." Ex. 1008 at 3:2-3.



Ex. 1008, Fig. 6. Figure 6 shows "driver and passenger doors **24** [yellow] and **26** are located rearwardly of driver and passenger seats **28** and **30** [green] so as not to obstruct access into and out of the cab, as depicted by arrow **62** [red]." *Id.* at 5:35-40. Arrow 62 shows that entry through the door (24) into the cabin provides access to the seats from between the seats. *Id.*, Fig. 6. A person of ordinary skill in the art would be motivated to incorporate Marlowe's design into Modec because they would know that providing a single, central aisle for accessing both seats conserves more space in the cab than providing two separate pathways. Accordingly, claim 21 would have been obvious.

4. Claim 26

a. "A semi-truck vehicle"

110. This limitation is identical to the limitation of claim 1 discussed above in Sections VII(B)(1)(a) and VII(B)(1)(k) and is disclosed or would have been obvious for the same reasons set forth above.

b. "an electric drive train"

111. This limitation is identical to the limitation of claim 1 discussed above in Section VII(B)(1)(b) and is disclosed or would have been obvious for the same reasons set forth above.

c. "a body"

112. This limitation is identical to the limitation of claim 1 discussed above in Section VII(B)(1)(c) and is disclosed or would have been obvious for the same reasons set forth above.

d. "a cabin located within the body of the vehicle, wherein the cabin comprises an interior that is configured to accommodate at least one person"

113. This limitation is identical to the limitation of claim 1 discussed above in Section VII(B)(1)(d) is disclosed or would have been obvious for the same reasons set forth above.

e. "a first seat and a second seat located in the interior of the cabin"

114. For the reasons set forth above with respect to claim 21, Modec discloses both "a driver and a passenger seat (not shown)." Ex. 1004 at 15:30-31. The "passenger seat" of Modec is the "second seat" required by claim 26.

f. "a door that provides ingress and egress to the interior of the cabin"

115. Modec discloses this limitation for the same reasons set forth above in Section VII(B)(1)(f).

g. "the door being located on the body such that a frontmost side of the door is adjacent to a rearmost portion of a front wheel well"

116. This limitation is identical to the limitation of claim 1 discussed above in Section VII(B)(1)(g) and is disclosed or would have been obvious for the same reasons set forth above.

h. "and at least a portion of the door being positioned behind the first seat, at least a portion of the first seat is disposed to be forward of a line defining the rearmost portion of the front wheel well"

117. This limitation is essentially identical to the limitation of claim 1 discussed above in Section VII(B)(1)(h), except the limitation of claim 1 recites "the seat" instead of "the first seat" and includes the additional language "such that the door opens to provide ingress and egress into the cabin from the backside of the seat." Modec discloses this limitation for the same reasons set forth above in

Section VII(B)(1)(h), with Modec's driver seat being the "first seat" required by claim 26.

i. an entryway provided between the first seat and the second seat, wherein the entryway comprises a vertical height extending from a floor of the cabin to at least a top of the first seat or the second seat;

118. The annotated Figure 1 of Modec shown below illustrates why a person of ordinary skill in the art would understand that Modec implicitly discloses an "entryway provided between the first seat and the second seat, wherein the entryway comprises a vertical height extending from a floor of the cabin to at least a top of the first seat or the second seat."

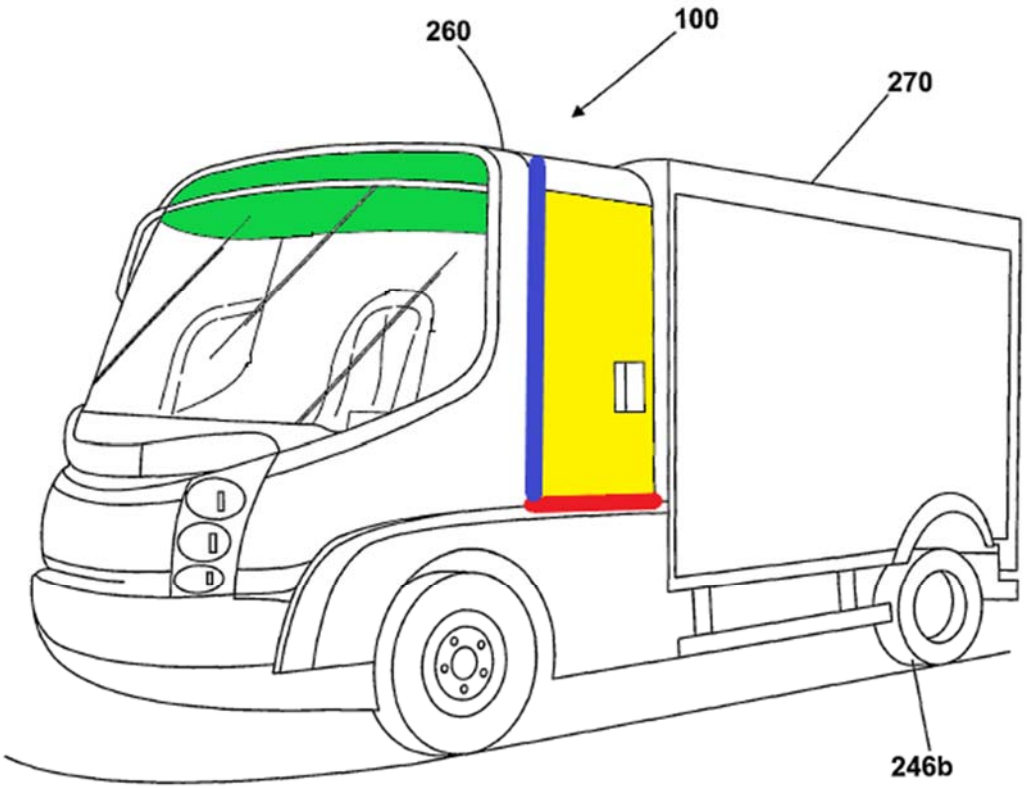


Fig. 1

As shown above, Modec graphically discloses a ceiling (green) of the cabin that is above the seat and the space behind the seat. A person of ordinary skill in the art would understand that the door (yellow) must open up to reveal a floor on the other side of the door, at about the level of the lower edge (red) of the door, to prevent the driver from falling through to the undercarriage of the vehicle. Because the door is at least partially behind the seat, a person of ordinary skill in the art would also understand that there is an entryway behind and between the two seats that extends vertically from the floor (red) to the ceiling (green) of the cabin, which, as shown, is above the seat. Therefore, Modec implicitly discloses "an entryway provided between the first seat and the second seat wherein the entryway comprises a vertical height extending from a floor of the cabin to at least a top of the first seat or the second seat."

119. Further, it would have been obvious, in view of Modec's disclosure of a door located behind the driver seat, to provide an entryway behind and between the two seats that extends vertically from the floor (red) to the ceiling (green) of the cabin, which, as shown, is above the seat as the most convenient and easiest pathway for the driver to get from the door to the driver seat upon entering the cabin.

j. "wherein the entryway provides access to either of the first seat or the second seat."

120. As explained above with respect to claim 21, Marlowe discloses a pathway from the door to either one of the first seat or the second seat:

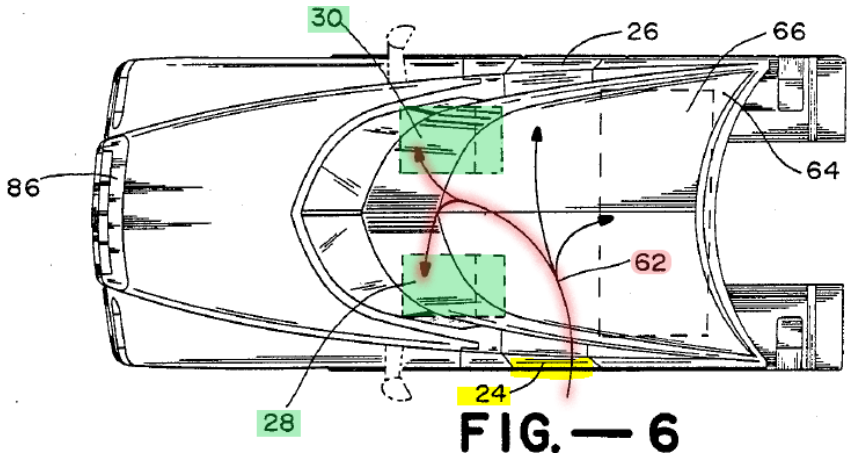


FIG. — 6

Ex. 1008, Fig. 6. A person of ordinary skill in the art would be motivated to incorporate Marlowe's design into Modec because they would understand that providing a single, central aisle for accessing both seats conserves more space in the cab than providing two separate pathways.

k. It would have been obvious, and a person of ordinary skill in the art would have been motivated, to use Modec's relative positioning of the door, seat, and front wheel well with a "semi-truck vehicle."

121. For the same reasons set forth above in Section VII(B)(1) with respect to claim 1, a person of ordinary skill in the art would have found it obvious, and would have been motivated, to use Modec's disclosed positioning of the door, seat,

and front wheel well with a "semi-truck vehicle." Therefore, claim 26 of the '084 patent would have been obvious.

E. Ground 4: Claims 9-11 would have been obvious over Modec, Messano, and Eltra

1. Claim 9: "wherein the door slides on an upper track, a mid-track, and a lower track located externally on the body of the semi-truck vehicle to open and close the door."

122. It would have been obvious to one of ordinary skill in the art to modify the cabin of Modec and Messano to use a sliding door, as disclosed in Eltra, that "slides on an upper track, a mid-track, and a lower track located externally on the body of the semi-truck vehicle to open and close the door." Eltra discloses "sliding doors provided on the passenger side of conventional motor vehicles." Exhibit 1009 at 1:4-5. Eltra discloses that, "[s]uch a [sliding] door is supported at three points, two support points having fixed arms which ride in tracks provided in the vehicle body. […] The third support points involves a spring loaded pivotally mounted arm riding in a track on the vehicle body disposed on the exterior of the vehicle, either at the top or center of the vehicle side." *Id*. at 1:8-15. Thus, Eltra discloses the three-track sliding door of claim 9.

123. A person of ordinary skill in the art would have been motivated to use Eltra's three-track sliding door of Eltra with the cabin of Modec and Messano. As Eltra discloses, sliding doors were a well-known alternative to hinged doors for large vehicles before the time of the invention. A person of ordinary skill in the art

would have understood that sliding doors are advantageous for semi-truck vehicles and other large vehicles because they provide a relatively easy and safe mechanism for opening the door and providing easy access to the interior of the vehicle. The person of ordinary skill in the art would have also recognized that the three-track sliding door design of Eltra is advantageous to properly secure the door to the vehicle at multiple attachment points while preventing damage to both the door and the tracks. Accordingly, claim 9 would have been obvious.

2. Claim 10: "wherein the door moves outward with respect to the body and backward with respect to the seat as the door is moved to an open position."

124. As explained above with respect to claim 9, it would have been obvious to use the sliding door disclosed in Eltra with the Modec and Messano cabin. Claim 10 depends from claim 9 and recites merely well-known functionality of conventional sliding doors for vehicles. Indeed, as a person of ordinary skill in the art would have recognized, almost all conventional sliding doors in vehicles "move[] outward with respect to the body and backward with respect to the seat as the door is moved to an open position."

125. Eltra expressly discloses the well-known functionality of conventional sliding doors for vehicles. Specifically, Eltra discloses:

> When the door is being opened, the rear edge of the door is moved outwardly […]. Then, as the door is moved rearwardly, the door slides to the rear at an angle […]."

Id. at 1:21-26. A person of ordinary skill in the art would have been motivated to use this well-known and conventional functionality because it was time-tested and known to work reliably. Accordingly, it would have been obvious to modify Modec and Messano to use a sliding door according to claim 9 "wherein the door moves outward with respect to the body and backward with respect to the seat as the door is moved to an open position." Accordingly, claim 10 would have been obvious.

3. Claim 11: "wherein an activation signal turns on a drive motor to pull the door open and closed."

126. As explained above, claim 10 would have been obvious in view of Modec, Messano, and Eltra. Claim 11 merely adds a conventional automatic sliding-door variation in which "an activation signal turns on a drive motor to pull the door open and closed." Eltra expressly discloses this well-known and conventional variation of vehicle sliding doors:

> An electrical switch disposed at any convenient point is used to open and close the door. When the electrical switch is operated to open the door, the cable which is terminated at the lever attached to the conventional operating mechanism is wound onto a winch, first unlatching then opening the door. An electrical switch, integral with the winch assembly, turns the winch motor off when the door reaches a predetermined position near the full open position. When the electrical switch is actuated to close the door, the cable which is guided around the edge of the door frame, and attached to the rear

> edge of the door, is wound onto a winch drum, pulling the door towards its closed position.

Id. at 4:12-25. One of ordinary skill in the art would understand that this disclosure describes the use of a drive motor to pull the sliding door open and closed. Thus Eltra discloses a door "wherein an activation signal turns on a drive motor to pull the door open and closed."

127. A person of ordinary skill in the art would be motivated to use Eltra's motor-driven automatic sliding door with Modec and Messano. Specifically, a person of ordinary skill in the art would have known that the conventional motor-driven automatic sliding door disclosed by Eltra would be more convenient, easier to use, and safer than a manual sliding door. These advantages would be particularly compelling for the larger, heavier doors needed for a commercial vehicle or semi-truck vehicle disclosed by Modec and Messano. Accordingly, claim 11 would have been obvious.

F. Ground 5: Claim 12 would have been obvious over Modec, Messano, and Racz

128. Claim 12 depends from claim 1 and adds nothing more than "the door is hinged at one end and attached to the body of the semi-truck vehicle to open and close the door." There is literally nothing more well-known or conventional than a hinged vehicle door. A person of ordinary skill in the art would find claim 12 self-evidently obvious over Modec and Messano.

129. Further, Racz expressly discloses a semi-truck vehicle with the claimed hinged door. Racz discloses "an over the highway tractor" which "includes the usual cab **12** which is fitted with an access door **14**" wherein "the door is mounted by a pair of hinges **16**." Exhibit 1010 at [0014]. Figure 1 of Racz is reproduced below.

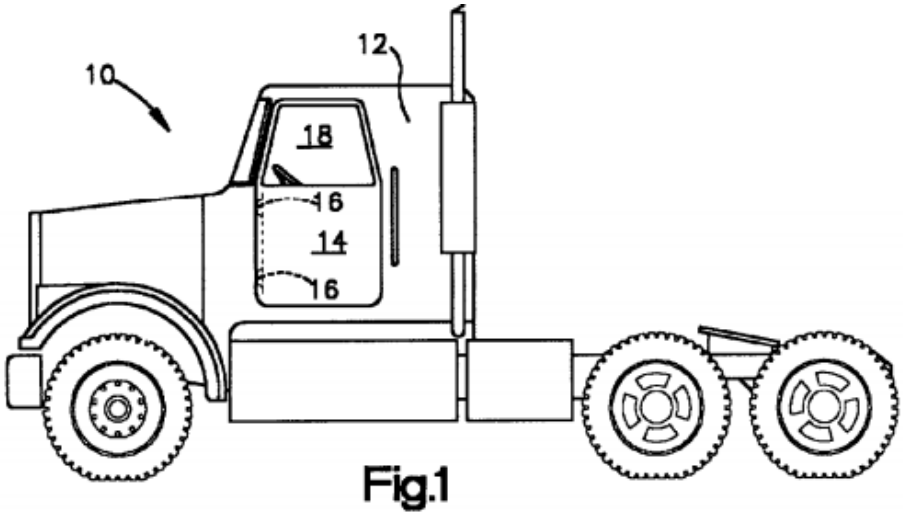


Fig.1

A person of ordinary skill in the art would be motivated to use the conventional hinged door of Racz with the cabin of Modec and Messano because conventional hinges were time-tested and known to be reliable mechanisms for attaching doors to vehicles and allowing the doors to be opened. Accordingly, claim 12 would have been obvious.

G. Ground 6: Claim 13 would have been obvious over Modec, Messano, and Kia

130. Claim 13 depends from Claim 1 and adds the limitation "wherein the door comprises a peak load sensor configured to sense a threshold, such that when

a load on the door is higher than a threshold a control unit reverses the direction of the door and keeps the door from closing."

131. Kia discloses an "automatic stop and reversal" feature for a "power sliding door." Ex. 1011 at 35. Kia states:

> If the power opening or closing is blocked by an object or part of the body, ***the power sliding door*** and power tailgate ***will detect the resistance***, then the chime will sound 3 times, and stop movement or move to the full open position to allow the object to be cleared.
>
> However, ***if the resistance is weak such as an object that is thin or soft***, or the door is near latched position, ***the automatic stop and reversal may not detect the resistance*** and the closing operation will continue.

Id. (emphases added). A person of ordinary skill in the art would have understood this disclosure to mean that the power sliding door uses a "peak load sensor configured to sense a threshold, such that when a load on the door is higher than a threshold a control unit reverses the direction of the door and keeps the door from closing." A person of ordinary skill in the art would also have understood that Kia's disclosure stating that "if the resistance is weak such as an object that is thin or soft […] the automatic stop and reversal may not detect the resistance," is because thin or soft objects will not create sufficient resistance to cause the "load on the door" to be "higher than a threshold."

132. A person of ordinary skill in the art would have been motivated to include an "automatic stop and reversal" feature, as disclosed by Kia, with the combination of Modec and Messano because the "automatic stop and reversal" feature is an advantageous safety feature known by those of skill in the art to reduce injuries and property damage caused by an automatic door closing on a person or property.

133. Kia and Modec are both within general technological field of vehicle doors and a person of ordinary skill in the art would have understood that Kia's "automatic stop and reversal" feature could be easily scaled and successfully used with a semi-truck vehicle to provide the same safety advantages. Accordingly, claim 13 would have been obvious.

H. Ground 7: Claim 14 would have been obvious over Modec, Messano, and Marlowe

134. Claim 14 depends from claim 1 and adds the limitation "wherein the door is located approximately at a midpoint of the body of the semi-truck vehicle to provide ingress and egress into the cabin."

135. Figure 1 of Marlowe, reproduced below, shows driver's door **24** (green).

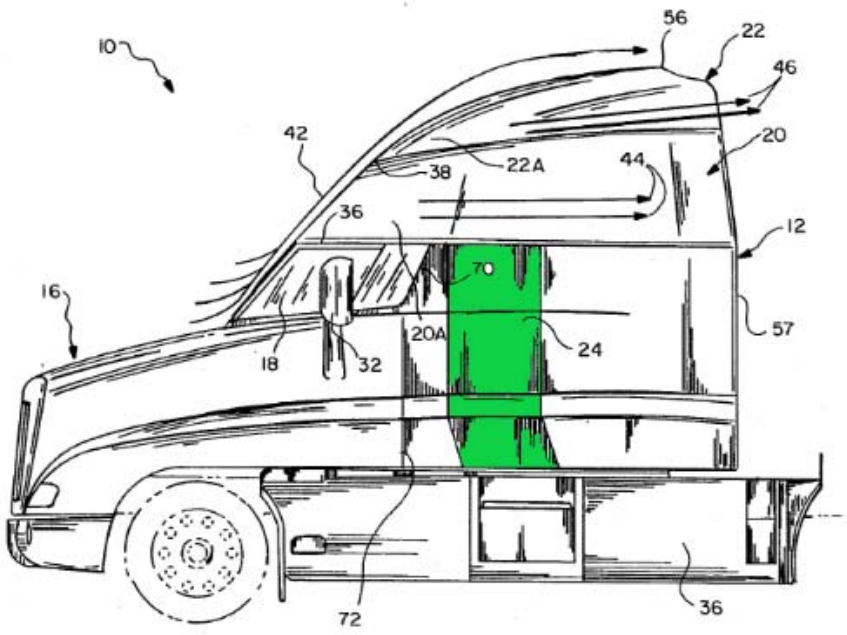


FIG. — 1

Ex. 1008, Fig. 1 (color added). A person of ordinary skill in the art would have understood that Figure 1 of Marlowe shows a semi-truck "wherein the door is located approximately at a midpoint of the body of the semi-truck vehicle to provide ingress and egress into the cabin."

136. A person of ordinary skill in the art would have been motivated to modify the combination of Modec and Messano with the door location from Marlowe because locating the door at the midpoint of the body is an obvious design choice, which provides provide additional space behind the seat. Accordingly, claim 14 would have been obvious.

I. Ground 8: Claims 17 and 19 would have been obvious over Modec, Messano, and Plummer

1. Claim 17: "wherein the vehicle further comprises a sleeper within the cabin."

137. Claim 17 depends from Claim 1 and adds the limitation that "wherein the vehicle further comprises a sleeper within the cabin".

138. Plummer contains Figure 5, reproduced below. Plummer states that, "As is indicated in FIG. 5, the interior region of a long-haul truck typically includes a sleeper unit 142 and a driving compartment 144." Exhibit 1012 at 15:38-40.

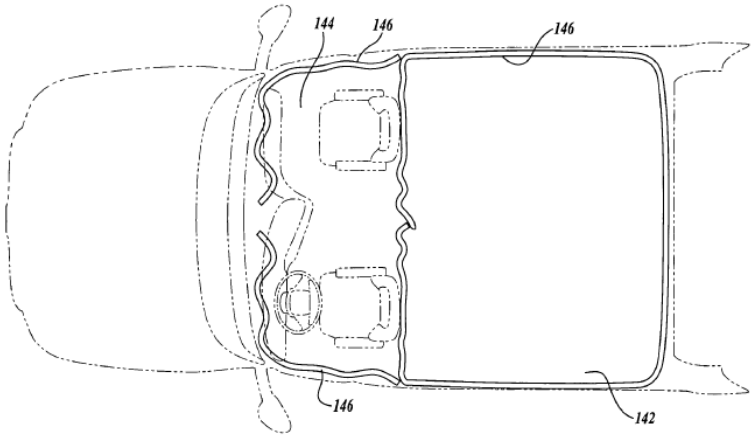


Fig.5.

139. One of ordinary skill in the art would have known that semi-trucks often contained sleeper units, as semi-truck drivers often sleep in their trucks.

140. One of ordinary skill in the art would have been motivated to add the conventional sleeper described in Plummer to provide a place for the driver to sleep during long-haul trips. Accordingly, claim 17 would have been obvious.

2. Claim 19: "wherein the sleeper comprises a bunk bed, a cooling appliance having a volume that is at least 15 cubic feet, and a microwave oven."

141. Claim 19 depends from Claim 1 and adds the limitation, "wherein the sleeper comprises a bunk bed, a cooling appliance having a volume that is at least 15 cubic feet, and a microwave oven".

142. A person of ordinary skill in the art would have understood that Plummer's "sleeper unit" would have a bed. A person of ordinary skill in the art would have known that bunk beds could be used in semi-truck sleeper units, and would have been motivated to design the sleeper unit with the obvious design choice of a bunk bed, in order to provide storage or to locate other truck features under the bed. It was known to include a bunk bed in a semi-truck sleeper unit. *See* Ex. 1015.

143. Plummer also discloses that "[v]arious vehicles such as long-haul trucks . . . include heating and air conditioning, lighting, and appliances such as refrigerators, coffee makers and microwave ovens." Ex. 1012 at 1:15-22. A person of ordinary skill in the art would have understood that a refrigerator is "a cooling appliance". It would have been an obvious design choice to a person of

ordinary skill in the art to provide a refrigerator with a "volume that is at least 15 cubic feet." A person of ordinary skill in the art would have understood that the selection of a specific volume for a refrigerator would be an obvious design choice, and the selection of a refrigerator having a volume that is at least 15 cubic feet would have been an obvious design choice to maximize the storage space for refrigerated items.

144. A person of ordinary skill in the art would have known that bunk beds, refrigerators, and microwave ovens were conventional items included in sleeping units for the comfort and convenience of the driver. A person of ordinary skill in the art would have been motivated to add a "bunk bed, a cooling appliance having a volume that is at least 15 cubic feet, and a microwave oven" to a truck sleeper with the combination of Modec and Messano in order to provide a place for the driver to sleep, additional storage, and ways for the driver to refrigerate and cook or warm food during long-haul trips. Accordingly, claim 19 would have been obvious.

J. Ground 9: Claims 18 and 20 would have been obvious over Modec, Messano, and Marlowe

1. Claim 18: "wherein the door opens into the sleeper of the cabin."

145. Claim 18 depends from claim 17 and adds the limitation that "the door opens into the sleeper of the cabin."

146. Marlowe discloses a semi-truck with a door that "opens into the sleeper of the cabin." Figure 6, reproduced below, is a "top plan view" "diagrammatically illustrating the interior of the truck's cab and the way in which an individual can enter the cab through one of its side doors." Ex. 1008 at 2:41-44. Figure 6 shows "driver and passenger doors **24** [yellow] and **26**." *Id.* at 5:35-36. Figure 6 also shows that the "cab **12** includes a sleeper section **64** including a bed [blue] generally represented at **66**."

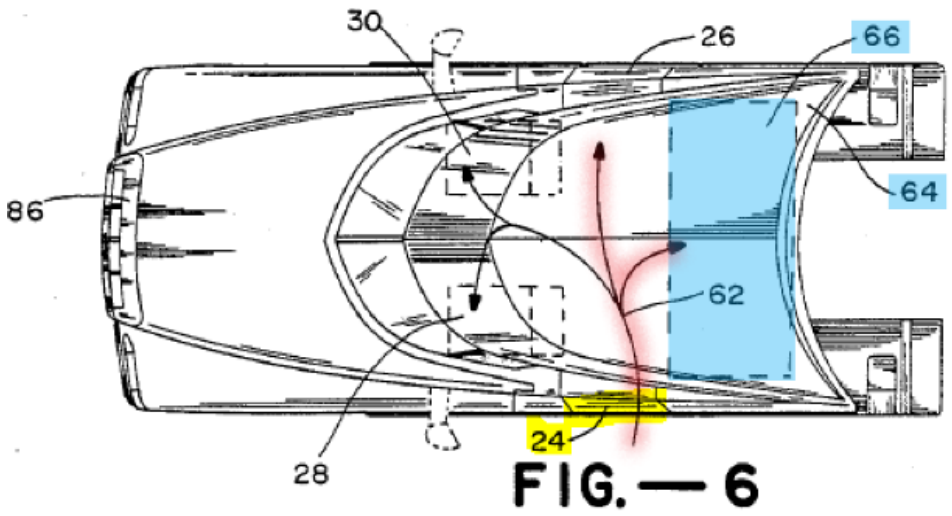


FIG. — 6

Id., 5:40-42; Fig. 6. A person of ordinary skill in the art would understand that the sleeper section (64) and the bed (66) are the "sleeper of the cabin." Marlowe discloses that "[t]his sleeper section is located rearwardly of doors **24** and **26** so as not to obstruct access into and out of the cab, again as depicted by arrow **62**." *Id.* at 5:42-45. Arrow 62 clearly shows that the door of the cabin (24) opens into the sleeper of the cabin.

147. The Future Truck Report discloses that doors next to the driver seat or the passenger seat weaken the cab structure and can restrict the size of the driver or passenger windows. Therefore, a cab design in which the door is not next to the driver seat or the passenger seat would increase the cab strength and allow for larger driver and passenger windows, increasing safety and visibility. A person of ordinary skill in the art would understand that a door opening into the sleeper of the cab would increase the cab strength and safety, as described by the Future Truck Report. Accordingly, claim 18 would have been obvious.

2. Claim 20: "wherein entry into the cabin of the semi-truck vehicle provides full access to the seat and the sleeper simultaneously."

148. Claim 20 depends from claim 17 and adds the limitation that "entry into the cabin of the semi-truck vehicle provides full access to the seat and the sleeper simultaneously."

149. Marlowe discloses a semi-truck "wherein entry into the cabin of the semi-truck vehicle provides full access to the seat and the sleeper simultaneously." Figure 6 of Marlowe, reproduced below, is a "top plan view" "diagrammatically illustrating the interior of the trucks cab and the way in which an individual can enter the cab through one of its side doors." Ex. 1008 at 2:41-44.

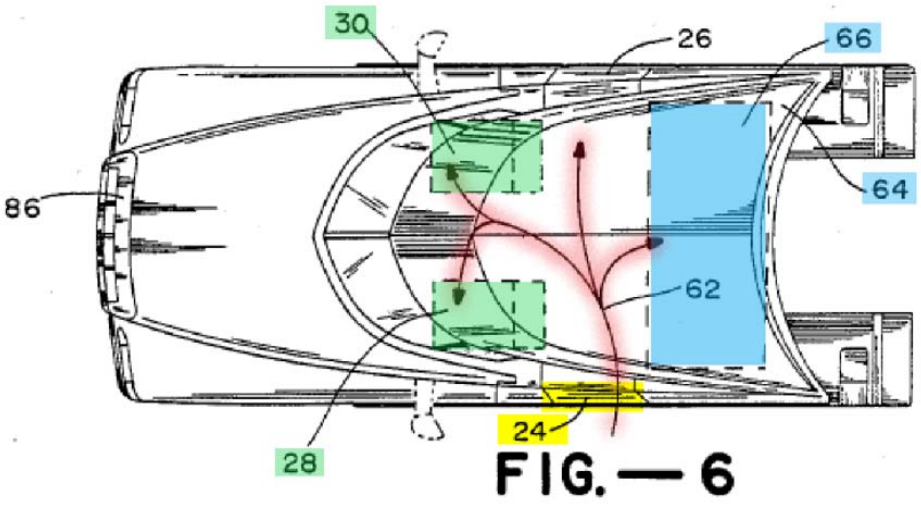


FIG. — 6

Id., Figure 6. Figure 6 shows "driver and passenger doors **24** [yellow] and **26** are located rearwardly of driver and passenger seats **28** and **30** [green] so as not to obstruct access into and out of the cab, as depicted by arrow **62** [red]." *Id.* at 5:35-40. Arrow 62 clearly shows that entry into the cabin through the door (24) provides access to the seats. *Id.*, Fig. 6.

150. Figure 6 also shows that the "cab **12** includes a sleeper section **64** including a bed [blue] generally represented at **66**." *Id.* at 5:40-42. A person of ordinary skill in the art would understand that the sleeper section (64) and the bed (66) are the "sleeper of the cabin." Marlowe discloses that "[t]his sleeper section is located rearwardly of doors **24** and **26** so as not to obstruct access into and out of the cab, again as depicted by arrow **62**." *Id.* at 5:42-45. Arrow 62 clearly shows that entry from the door of the cabin (24) provides access to the sleeper section. *Id.*, Fig. 6.

151. A person of ordinary skill in the art would have been motivated to add the disclosed sleeper section of Marlowe to Modec and Messano to provide a place for the driver to sleep during long-haul trips.

152. The Future Truck Report discloses that doors next to the driver seat or the passenger seat weaken the cab structure and can restrict the size of the driver or passenger windows. Therefore, a cab design in which the door is not next to the driver seat or the passenger seat would increase the cab strength and allow for larger driver and passenger windows, increasing safety and visibility. A person of ordinary skill in the art would understand that a cab design with the door positioned as in Marlowe would increase the cab strength and allow for larger driver and passenger windows, increasing safety and visibility. Accordingly, claim 20 would have been obvious.

K. Ground 10: Claim 22 would have been obvious over Modec, Messano, and the Man Annual Report

153. Claim 22 depends from claim 1 and adds the limitation "wherein an opening into the cabin comprises a clearance that is at least six feet five inches in height." In further view of the Man Annual Report, it would have been obvious to modify the combination of Modec and Messano to make the door "at least six feet five inches in height" to allow most drivers to enter the truck without stooping or crouching.

154. The Man Annual Report, published in 2012, contained several pictures of the Man Concept S semi-truck, including the following picture of a semi-truck vehicle with a full-sized door extending nearly the entire height of the cab, reproduced below:

Ex. 1013 at 9. A person of ordinary skill in the art would understand from that picture that the pictured door extends almost the entire height of the cabin, and would provide "an opening into the cabin" with "a clearance that is at least six feet five inches in height."

155. The Man Annual Report also published a picture showing the same Man Concept S semi-truck near two people, reproduced below:

Ex. 1013 at 8. A person of ordinary skill in the art would understand from this picture that the cabin of the semi-truck pictured is at least several feet taller than the people standing in front of the truck.

156. Based on the two photos from the Man Annual Report reproduced above, a person of ordinary skill in the art would understand that the door of the

Man Concept S truck pictured provides "an opening into the cabin" with "a clearance that is at least six feet five inches in height."

157. Designing a cab with a door that is at least six feet five inches in height would be an obvious design choice for large vehicles such as semi-trucks. A person of ordinary skill in the art would have known that taller doors are generally preferred to shorter doors because they allow a wider variety of people to enter the vehicle without stooping, crouching, or risking head injury. A person of ordinary skill in the art would have understood that a door "at least six feet five inches in height" would allow most drivers to enter the truck without stooping, crouching, or risking head injury.

158. A person of ordinary skill in the art would also have understood that designing a cab with a door "at least six feet five inches in height" would require nothing more than routine adjustments to the overall size of the cabin and that there would be no technical or other obstacle to the use of a door of that height with Modec and Messano. Accordingly, claim 22 would have been obvious.

L. Ground 11: Claims 23-24 would have been obvious over Modec, Messano, and Freightliner

1. Claim 23:"wherein the semi-truck vehicle further comprises at least one full-size step and at least one hand hold to provide at least two points of leverage and for access and entry into the interior of the cabin."

159. Claim 23 depends from Claim 1, and adds the limitation "wherein the semi-truck vehicle further comprises at least one full-size step and at least one hand hold to provide at least two points of leverage and for access and entry into the interior of the cabin."

160. A person of ordinary skill in the art would have been motivated to design a cabin with at least one full-size step and at least one hand hold, as they would be aware of the need for such features to allow the driver to enter the cabin safely and easily. A person of ordinary skill in the art would be aware of the general practice in the industry of including steps and handholds to provide leverage and for access and entry into the cabin of trucks. It would be an obvious design choice for a person of ordinary skill in the art to include these features in the design of any truck.

161. Freightliner discloses the use of handholds and steps in truck design. The below image is reproduced from Freightliner.

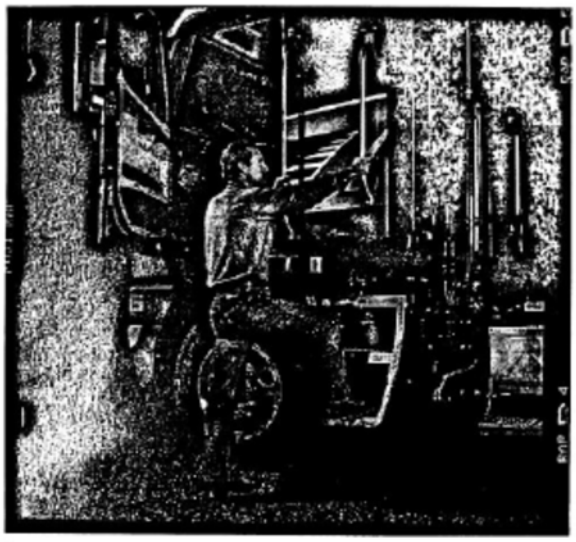


Figure 13. Driver Entering the Argosy Cab with Traditional Steps

Exhibit 1014 at 14. An image of the same figure currently accessible from the JSTOR website is reproduced below:

Figure 13. Driver Entering the Argosy Cab with Traditional Steps

Ex. 1019 at 5. A person of ordinary skill in the art would recognize that Figure 13 depicts a semi-truck with two full-size steps and two handles. A person of

ordinary skill in the art would also recognize that the handles and steps shown in Figure 13 would give the user at least two points of leverage, and would provide the driver with access and entry into the cabin.

162. A person of ordinary skill in the art would be motivated to include the full-size step and handhold of Freightliner with the combination of Modec and Messano because the handholds and steps disclosed in Freightliner would make it easier and safer for the driver to enter the cabin. Indeed, Freightliner expressly teaches that steps and handholds are necessary to allow a driver to safely and more easily enter the cabin. Exhibit 1014 at 14 (illustrating a COE truck and explaining the need for steps and handholds to enter the cabin). Accordingly, claim 23 would have been obvious.

2. Claim 24: "wherein there are two steps and two handholds that provide four points of leverage for entry into the interior of the cabin, such that a user enters into the cabin facing forward."

163. Claim 24 depends from Claim 23, and adds the limitation, "wherein there are two steps and two handholds that provide four points of leverage for entry into the interior of the cabin, such that a user enters into the cabin facing forward."

164. As described above, Figure 13 of Freightliner depicts a semi-truck with two full-size steps and two handles. As shown in Figure 13, reproduced below, Freightliner also shows that the user enters into the cabin facing forward.

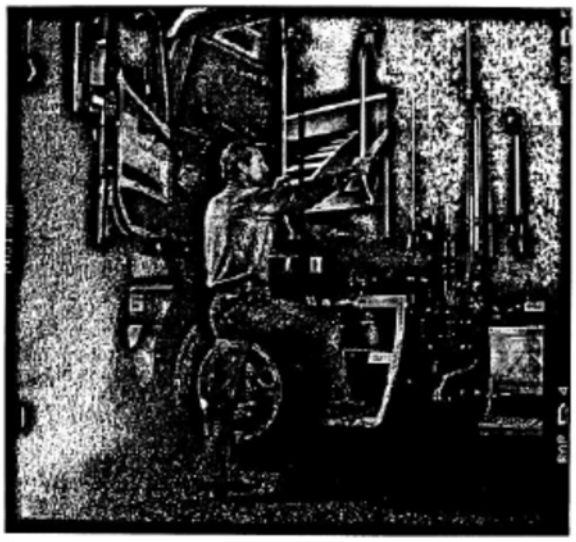


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Figure 13. Driver Entering the Argosy Cab with Traditional Steps

Ex. 1019 at 5. A person of ordinary skill in the art would recognize that Figure 13 depicts a semi-truck with two full-size steps and two handles. One of skill in the

art would also recognize that the two steps and two handles in Figure 13 would give the user at least four points of leverage for entry into the interior of the cabin.

165. A person of ordinary skill in the art would be motivated to include the full-size step and handhold of Freightliner with the combination of Modec and Messano because the handholds and steps disclosed in Freightliner would make it easier and safer for the driver to enter the cabin. Indeed, Freightliner expressly teaches that steps and handholds are necessary to allow a driver to safely and more easily enter the cabin. Exhibit 1014 at 14 (illustrating a COE truck and explaining the need for steps and handholds to enter the cabin). Accordingly, claim 24 would have been obvious.

M. Secondary Considerations

166. I understand that, to the extent there is any evidence of secondary considerations showing that the claims would not have been obvious, such evidence is typically introduced by patent owners in an IPR after the petition has been filed. However, I considered any relevant information known to me and I am not aware of any secondary considerations of non-obviousness that would suggest that the claims of the ’084 patent would not have been obvious. For example: (1) I am not aware of any evidence that a commercial embodiment of the claims has achieved commercial success because of the merits of the claimed features; (2) I am not aware of any evidence that the inventors of the ’084 patent solved a long-

felt but previously unsolved need; and (3) I am not aware of any evidence of failure by others. I reserve the right to evaluate and respond to any evidence of alleged secondary considerations of non-obviousness that Patent Owner introduces in this proceeding.

VIII. CONCLUSION

167. For the foregoing reasons, claims 1-26 of the '084 patent would have been obvious. I understand that Patent Owner may make arguments and introduce evidence to attempt to rebut my analysis and conclusions set forth herein. I reserve the right to evaluate and respond to Patent Owner's arguments and evidence.

168. I 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 on September 20, 2019 at Beverly Hills, Michigan.

Brian C. Baker

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