

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TEXTRON SPECIALIZED VEHICLES INC.

Petitioner

v.

SZ DJI TECHNOLOGY CO. LTD.

Patent Owner

U.S. Patent No. 11,482,121

PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 11,482,121

Submitted Electronically

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EXHIBIT LIST

Exhibit No. ¹	Description
1001	U.S. Patent No. 11,482,121 (“the ’121 Patent”)
1002	Prosecution History for the ’121 Patent.
1003	Declaration of David H. Williams
1004	U.S. Patent 7,164,986 (“Humphries”)
1005	U.S. Patent Pub. 2016/0189549 (“Marcus”)
1006	U.S. Patent Pub. 2014/0375480 (“Morgan”)
1007	U.S. Patent 9,078,098 (“Cronin”)
1008	U.S. Patent 6,718,235 (“Borugian”)
1009	Complaint, SZ DJI Technology Co. Ltd. v. Textron Specialized Vehicles Inc., Case No. 1:23-cv-00055 (DE), filed January 17, 2023
1010	PACER Docket Report, SZ DJI Technology Co. Ltd. v. Textron Specialized Vehicles Inc., Case No. 1:23-cv-00055 (DE), filed January 17, 2023 (as of August 4, 2023).
1011	U.S. Patent App. No. 62/098,968 (“Marcus Provisional”)

¹ Citations to patents are made by column and line cite; citations to U.S. patent publications are made by paragraph number; citations to International patent applications are made by page number; citations to other exhibits are made with reference to the Bates-stamped pagination.

LIST OF CLAIMS

Claim 1:

1[Pre]	A system for managing a restriction region, the system comprising:
1[a]	one or more processors configured to:
1[b]	receive one or more parameters of a designated restriction region for a ground vehicle, the one or more parameters being input by a user via a user interface, wherein the one or more parameters of the designated restriction region include at least a location associated with a private property;
1[c]	authenticate an identity of the user to determine whether the user is authorized to designate the restriction region;
1[d]	in response to determining the user is authorized to designate the restriction region, store the one or more parameters of the designated restriction region to a database;
1[e]	associate one or more response measures with the designated restriction region based on the one or more parameters; and
1[f]	implement the one or more response measures to affect operation of the ground vehicle along a travel path when the ground vehicle is within or near the designated restriction region, by at least one of (a) forcing the ground vehicle to change direction and move away from the designated restriction region, (b) forcing the ground vehicle to stop, or (c) providing an alert.

Claim 2:

2	The system of claim 1, wherein the one or more processors are further configured to: display the designated restriction region at the user interface.
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Claim 3:

3[a]	The system of claim 1, wherein: implementing the one or more response measures is performed when the ground vehicle is determined to be an unauthorized ground vehicle; and
3[b]	the ground vehicle is allowed to operate within or near the designated restriction region when the ground vehicle is determined to be an authorized ground vehicle.

Claim 4:

4	The system of claim 1, wherein the one or more parameters include at least time-related information.
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Claim 5:

5	The system of claim 4, wherein the time-related information is associated with at least one of: a special or non-regular event, or a recurring or regular event having a corresponding predetermined length.
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Claim 6:

6	The system of claim 4, wherein the time-related information indicates a duration or time period associated with the designated restriction region.
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Claim 7:

7	The system of claim 6, wherein the one or more parameters further include boundary information of the designated restriction region, and wherein the one or more processors are further configured to: associate the time-related information with the boundary information such that boundaries of the designated restriction region are removed or shrunk outside the duration or time period.
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Claim 8:

8	The system of claim 1, wherein the identity of the user is authenticated using a password, a phrase, or a code entered by the user, or using biometric input from the user.
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Claim 9:

9	The system of claim 1, wherein the one or more processors are configured to determine the user is authorized to designate the restriction region when the identity of the user is authenticated as an owner, a manager, or an authorized personnel of the private property.
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Claim 10:

10	The system of Claim 1, wherein the database is a temporary database.
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Claim 11:

11	The system of claim 1, wherein the identity of the user is authenticated using a password, a phrase, or a code entered by the user, or using biometric input from the user.
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Claim 12:

12	The system of claim 1, wherein the one or more processors are further configured to: access information associated with the designated restriction region from one or more third party data sources based on the location.
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Claim 13:

13	The system of claim 12, wherein the one or more third party data sources are private data sources that are privately accessible with granted access, or public data sources that are publicly accessible over the Internet.
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Claim 14:

14	The system of claim 12, wherein the one more third party data sources include government data sources, public records, or sources that list airport information, military bases, jurisdictional border, or public sensitive areas.
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Claim 15:

15	The system of claim 12, wherein the information includes one or more response measures associated with the designated restriction region that are extracted from the one or more third party data sources.
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Claim 16:

16[a]	The system of claim 1, wherein the user is a first user and the one or more parameters are one or more first parameters, and the one or more processors are further configured to:
16[b]	receive one or more second parameters of the designated restriction region input by a second user; and
16[c]	authenticate an identity of the second user to determine whether the second user is authorized to designate the restriction region.

Claim 17:

17[a]	The system of claim 16, wherein the one or more processors are further configured to: in response to determining the second user is authorized to designate the restriction region, determine a degree or type of authentication for the first user and the second user based on their identities;
17[b]	aggregate the one or more first parameters and the one or more second parameters to generate one or more aggregated parameters based on the degree or type of authentication for the first user and the second user; and
17[c]	store the one or more aggregated parameters of the designated restriction region to the database.

Claim 18:

18[pre]	A system for managing a restriction region, the system comprising:
18[a]	a non-transitory computer readable medium having instructions that, when executed:
18[b]	receive one or more parameters of a designated restriction region for a ground vehicle operating on private property, the one or more parameters being input by a user via a user interface;
18[c]	authenticate an identity of the user to determine whether the user is authorized to designate the restriction region;
18[d]	in response to determining the user is authorized to designate the restriction region, store the one or more parameters of the designated restriction region to a database;
18[e]	associate one or more response measures with the designated restriction region based on the one or more parameters; and

18[f]	implement the one or more response measures to affect operation of the ground vehicle along a travel path when the ground vehicle is within or near the designated restriction region, by at least one of (a) forcing the ground vehicle to change direction and move away from the designated restriction region, (b) forcing the ground vehicle to stop, or (c) providing an alert.
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Claim 19:

19	The system of claim 18, wherein the identity of the user is an identity of an owner of the private property.
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Claim 20:

20	The system of claim 18, wherein the identity of the user is an identity of a renter of the private property.
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Claim 21:

21	The system of claim 18, wherein authenticating the identity of the user includes receiving an electronic transmission from a third party that indicates that the user is authorized.
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Claim 22:

22	The system of claim 18, wherein the non-transitory computer readable medium directs an application hosted on a platform.
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Claim 23:

23	The system of claim 18, wherein the instructions, when executed, receive the one or more parameters via the user tracing on the user interface.
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Claim 24:

24[pre]	A system for managing a restriction region, the system comprising:
24[a]	one or more processors configured to:

24[b]	receive one or more parameters of a designated restriction region for a ground vehicle, the one or more parameters being input by a user via a user interface;
24[c]	authenticate an identity of the user to determine whether the user is authorized to designate the restriction region;
24[d]	in response to determining the user is authorized to designate the restriction region, store the one or more parameters of the designated restriction region to a database;
24[e]	associate one or more response measures with the designated restriction region based on the one or more parameters; and
24[f]	and implement the one or more response measures to affect operation of the ground vehicle along a travel path when the ground vehicle is within or near the designated restriction region by forcing the ground vehicle to stop movement.

Claim 25:

25	The system of claim 24, wherein the one or more processors are further configured to: display the designated restriction region at the user interface.
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Claim 26:

26	The system of claim 24, wherein: implementing the one or more response measures is performed when the ground vehicle is determined to be an unauthorized ground vehicle; and the ground vehicle is allowed to operate within or near the designated restriction region when the ground vehicle is determined to be an authorized ground vehicle.
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Claim 27:

27	The system of claim 24, wherein the one or more parameters include at least time-related information.
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Claim 28:

28[pre]	A system for managing a restriction region, the system comprising:
28[a]	a non-transitory computer readable medium having instructions that, when executed:

28[b]	receive one or more parameters of a designated restriction region for a ground vehicle, the one or more parameters being input by a user via a user interface;
28[c]	authenticate an identity of the user to determine whether the user is authorized to designate the restriction region;
28[d]	in response to determining the user is authorized to designate the restriction region, store the one or more parameters of the designated restriction region to a database;
28[e]	associate one or more response measures with the designated restriction region based on the one or more parameters; and
28[f]	and implement the one or more response measures to affect operation of the ground vehicle along a travel path when the ground vehicle is within or near the designated restriction region by forcing the ground vehicle to stop movement.

Claim 29:

29	The system of claim 28, wherein the one or more processors are further configured to: display the designated restriction region at the user interface.
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Claim 30:

30	The system of claim 28, wherein: implementing the one or more response measures is performed when the ground vehicle is determined to be an unauthorized ground vehicle; and the ground vehicle is allowed to operate within or near the designated restriction region when the ground vehicle is determined to be an authorized ground vehicle.
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I. INTRODUCTION

Textron Specialized Vehicles, Inc. (“Petitioner”) submits this petition for *Inter Partes* Review (“IPR”) of Claims 1-30 of U.S. Patent 11,482,121. The claims of the ’121 Patent are directed to the concept of forming a restricted region and triggering an alarm or other automated response if a vehicle is determined to be near or within the restricted region. Forming restriction regions relates to a well-known and well-developed field of art known as “geofencing.” It has been well-known in the art for at least more than a decade prior to the earliest conceivable priority date of the ’121 Patent to create geofences using well-known graphical user interfaces and drawing tools. *See* §VI.A. (overview of Humphries), below. And geofences have been well-known to have uses in tracking ground vehicles and automating responses if the geofence is violated. *Id.*; §§VI.B-E (Marcus, Morgan, Cronin, Borugian).

The ’121 Patent was not filed until 2015, well after these geofencing technologies were developed. In prosecution, the ’121 Patent gained allowance by amending independent claims to require 1) the designated restriction region include at least a location associated with a private property and 2) the system implement one or more “response measures to affect operation of a ground vehicle when the ground vehicle is within or near the designated restriction region,” with the response measures including the simple act of providing an automated response (*e.g.*, an alert). While the Examiner apparently did not locate a prior art geofence system

reciting these claim limitations, the prior art presented in this petition was not before the Examiner and discloses these limitations exactly. *See* §VI.A., below.

The remaining concepts of the independent claims 1, 18, 24, and 28 and their dependent Claims recite well-known geofencing concepts that had well-known benefits. As a result, the '121 Patent represents no novel or non-obvious advance over the prior art. Petitioner respectfully requests institution of IPR and a finding that all challenged claims are unpatentable.

II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Party-in-Interest Under 37 C.F.R. §42.8(b)(1)

Textron Specialized Vehicles Inc. is the Petitioner. No other parties exercised or could have exercised control over this Petition and no other parties funded or directed this Petition. Textron Specialized Vehicles Inc. further identifies Textron Inc. and Textron Innovations, Inc., as potential real-parties-in-interest.

B. Related Matters Under 37 C.F.R. §42.8(b)(2)

SZ DJI Technology Co. Ltd. has asserted the '121 Patent in the following civil action: *SZ DJI Technology Co. Ltd. v. Textron Specialized Vehicles Inc.*, Case No. 1:23-cv-00055 (DE), filed January 17, 2023. *See* EX1009, (Complaint).

C. Lead and Back-Up Counsel Under 37 C.F.R. §42.8(b)(3)

Petitioners provide the following designation of counsel.

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D. Service Information Under 37 C.F.R. §42.8(b)(4)

A copy of this entire Petition, including all Exhibits and a Power of Attorney, is being served by FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record for Patent Owner at the USPTO for the '121 Patent: Anova Law Group, PLLC, 21495 Ridgetop Circle, Suite 300, Sterling, VA, 20166.

Petitioner consents to electronic service at the e-mail addresses provided above for lead and back-up counsel. A Power of Attorney is filed concurrently herewith under 37 C.F.R. §42.10(b).

III. FEES

The Office is authorized to charge the fee in 37 C.F.R. § 42.15(a) to Deposit

Account No. 02-0384 and any additional fees that are due.

IV. REQUIREMENTS UNDER 37 C.F.R. § 42.104

A. Grounds for Standing

Petitioner certifies that the '121 Patent is eligible for IPR and that Petitioner is not barred or otherwise estopped.

B. Priority Date

The '121 Patent ultimately claims priority to PCT/CN2015/075625. Petitioner presumes without conceding that the earliest conceivable priority date for the '121 Patent is Mar. 31, 2015.

C. Prior Art

Exhibit 1004 – U.S. Patent 7,164,986 to Humphries (“Humphries”) was filed on Jan. 16, 2004 and issued on Jan. 16, 2007. Humphries qualifies as prior art under at least post-AIA 35 U.S.C. §§ 102(a)(1) and (2).

Exhibit 1005 – U.S. Patent Pub. 2016/0189549 to Marcus (“Marcus”) is the publication of a U.S. non-provisional patent application no. 14/984,023, which was filed on Dec. 30, 2015 and published on June 30, 2016. The Marcus non-provisional application claims priority to U.S. provisional application no. 62/098,968 (EX1011), which was filed on Dec. 31, 2014. Marcus qualifies as prior art under AIA 35 U.S.C. §§ 102(a)(2) and 102(d)(2) as of the date of its provisional application because the provisional application provides sufficient support for the subject matter relied upon for prior art purposes in Marcus. *See e.g., Penumbra Inc. v. Rapidpulse, Inc.*, No.

IPR2021-01466, Paper 34, at 29–35 (PTAB Mar. 10, 2023) (finding that under AIA §§ 102(a)(2) and 102(d), there is no need to evaluate whether any claim of a reference patent document is actually entitled to priority when applying such a reference patent as prior art); *Apple Inc. v. Telefonaktiebolaget LM Ericsson*, No. IPR2022-00341, Paper 10, at 14–22 (PTAB Sept. 14, 2022). To show the overlap of the relevant disclosure of Marcus and its provisional application, citations to both will be provided in the grounds below. Therefore, Marcus is § 102(a)(2) prior art as of the filing date of its provisional application, Dec. 31, 2014.

Exhibit 1006 – U.S. Patent Pub. 2014/0375480 to Morgan (“Morgan”) was filed June 24, 2013 and published on December 25, 2014. Morgan qualifies as prior art under at least post-AIA 35 U.S.C. §§ 102(a)(1) and (2).

Exhibit 1007 – U.S. Patent 9,078,098 to Cronin (“Cronin”) was filed February 13, 2015 and issued on July 7, 2015. Cronin qualifies as prior art under at least post-AIA 35 U.S.C. § 102(a)(2).

Exhibit 1008 – U.S. Patent 6,718,235 to Borugian (“Borugian”) was filed Mar. 6, 2002 and issued on April 6, 2004. Borugian qualifies as prior art under at least post-AIA 35 U.S.C. §§ 102(a)(1) and (2).

D. Identification of Challenge and Statement of Precise Relief Requested

Petitioner requests IPR of Claims 1-30 of the ’121 Patent based on the following grounds:

Ground	Claims	Statutory Basis (35 U.S.C. §)	Prior Art
1A	1-3, 8, 10, 11, 16, 17, 18, 22, 23	102	<i>Humphries</i>
1B		103	
2	1-3, 8-11, 16-23	103	<i>Humphries, Marcus</i>
3A	4-7	103	<i>Humphries, Morgan</i>
3B		103	<i>Humphries, Marcus, Morgan</i>
4A	12-15	103	<i>Humphries, Cronin</i>
4B		103	<i>Humphries, Marcus, Cronin</i>
5	24-26, 28-30	103	<i>Humphries, Borugian</i>
6	27	103	<i>Humphries, Borugian, Morgan</i>

Submitted with this Petition is a declaration of David H. Williams (EX1003), a qualified technical expert.

V. OVERVIEW OF '121 PATENT

A. '121 Patent

The '121 Patent contains four independent claims (Claims 1, 18, 24, and 28), and twenty-six dependent claims. The claims of the '121 Patent are directed to the concept of forming a restriction region and triggering an alarm or other automated response if a ground vehicle is determined to be near or within the restriction region.

The '121 Patent states that “it may be desirable to provide a platform for

managing flight restriction regions for aerial vehicles.”EX1001, 1:32-34; 1:46-47.

The ’121 Patent also purports to provide “centralized management for inputting, managing, and accessing flight restriction regions.” *Id.* 1:34-36. As depicted in Fig. 10, the ’121 Patent describes that the platform may interact with various users, external data sources, etc. EX1001, Fig. 10, 38:31-33.

FIG. 10

The continuation application that led to the issuance of the '121 Patent was filed on November 10, 2021. EX1002, p.1. On January 31, 2022, the Examiner issued an office action rejecting then pending claims 1-30 for lack of patentable

subject matter and obvious over U.S. Pub. No. 2014/0018979 (“Goossen”) in view of U.S. Pub. No. 2013/0269013 (“Parry”). EX1002, p.142.

In response to the Office Action, the Patent Owner responded on April 13, 2022, to amend the claims. The Patentee argued that the amended claims are patentable because Goossen and Parry did not teach “the designated restriction region include[ing] at least a location associated with a private property.” EX1002, p.332.

Given the Examiner’s objection and allowance of the amended and new claims, the Examiner apparently did not locate prior art teaching “the designated restriction region include[ing] at least a location associated with a private property.” As is disclosed herein, however, such features have been well-known and disclosed within the art for over ten years prior to the earliest conceivable priority date of the ’121 Patent. *See* §VIII.C.3, §IX.C.3, §XII.C.4, §XII.F.3, *infra*. If the Examiner had the benefit of the art presented in this petition, Petitioner submits that the amended and new claims would never have been allowed.

C. Level of Ordinary Skill in the Art

As of the earliest claimed priority date, a person of ordinary skill in the art (“POSITA”) would be a person with a B.S. degree in electrical engineering, computer engineering, or equivalent training or job experience, along with 1-2 years of experience in the field of GPS, location-based-services, and/or geofencing.

EX1003, ¶66. Additional education could compensate for less practical experience and vice versa. *Id.*

VI. SUMMARY OF PRIOR ART GEOFENCE TECHNOLOGY²

A. Humphries (EX1004)

Humphries discloses a system for managing a restriction region as is claimed by the '121 Patent. Humphries discloses a device tracking location adherence and route adherence technology that provides a tracked device receiving “a set of coordinates associated with a boundary area.” *See* EX1004, Abstract. Humphries’s system comprises “tracked devices 120, a data center 140, and a client 160” and various applications, including location adherence application 124, route adherence application 126, and alert generation application 128:

² The references relied on in this petition sometimes refer to a “geofence” using a hyphenated version of the term (*e.g.*, “geo-fence”). For consistency, this petition normalizes all quotes and references to use the non-hyphenated version of the term.

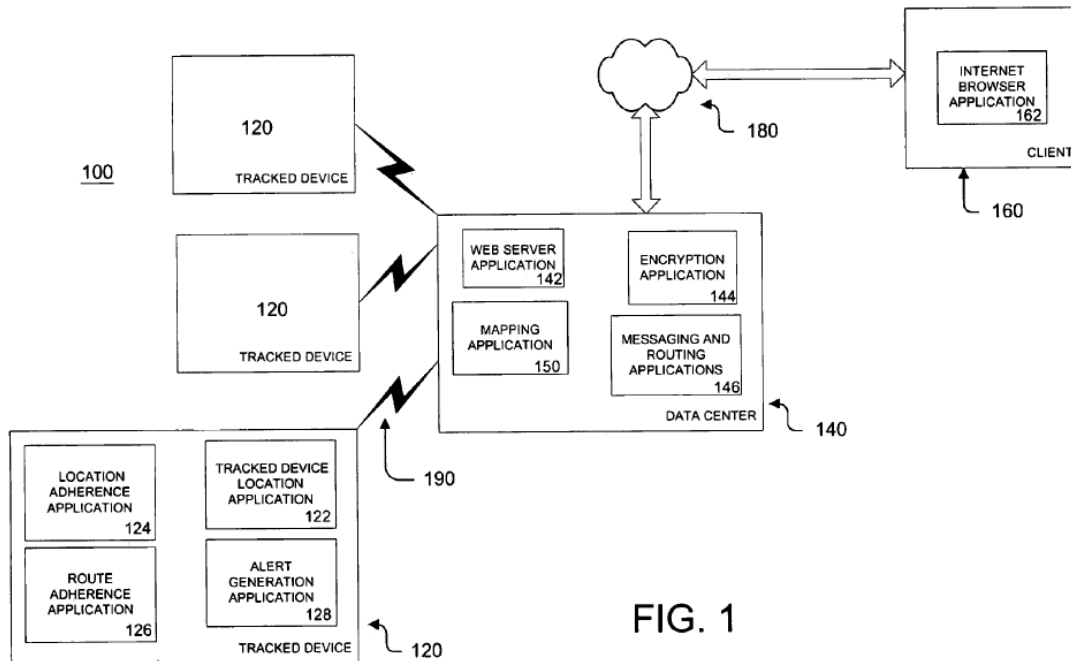


FIG. 1

See EX1004, 3:58-61, Fig. 1.

Humphries teaches that geofences can be created by a user of a mapping application, who can “create geofence object(s) that can be associated with the tracked devices 120 (*e.g.*, associated with a vehicle such as an automobile, truck or the like).” EX1004, 4:26-32; 5:18-29. The user can view or interact with the mapping application 150 via a “user interface display,” as depicted in Figure 2 (annotated):

diverted from the specific routes. EX1004, 2:9-12; 11:18-12:3. If the device has crossed the geofence or diverted from the specific routes and left the geofence objects, “an alert signal is generated.” EX1004, at 13-15.

B. Marcus (EX1005)

Marcus discloses systems receiving position information from a user associated with a private property, and forming restricted airspace for drone operation near the private property based on the position information. EX1005, abstract, [0022]; EX1011, abstract, [0010]. Property owners “may prevent, control, calibrate, or monitor [the drone’s] access to a private area and/or a controlled area.” EX1005, [0017]; EX1011, [0005]. And property owners “may be required to verify ownership or control of the property” to input address or location information of the private property into a database. *Id.*

C. Morgan (EX1006)

Morgan teaches establishing geofences, receiving signals indicative of a location of the tracked vehicle, and sending an alert if it is determined that the vehicle has crossed the geofence. EX1006, abstract, [0025], [0069]. Fig. 7 of Morgan describes “[t]he method of establishing a geo-fence at a predetermined time and for the duration of a preset duration.” EX1006, Fig. 7 (annotated); [0069]. Morgan teaches that the geofence may establish “every day; every week day; every weekend day; every third day, or every work day.” EX1006, [0035].

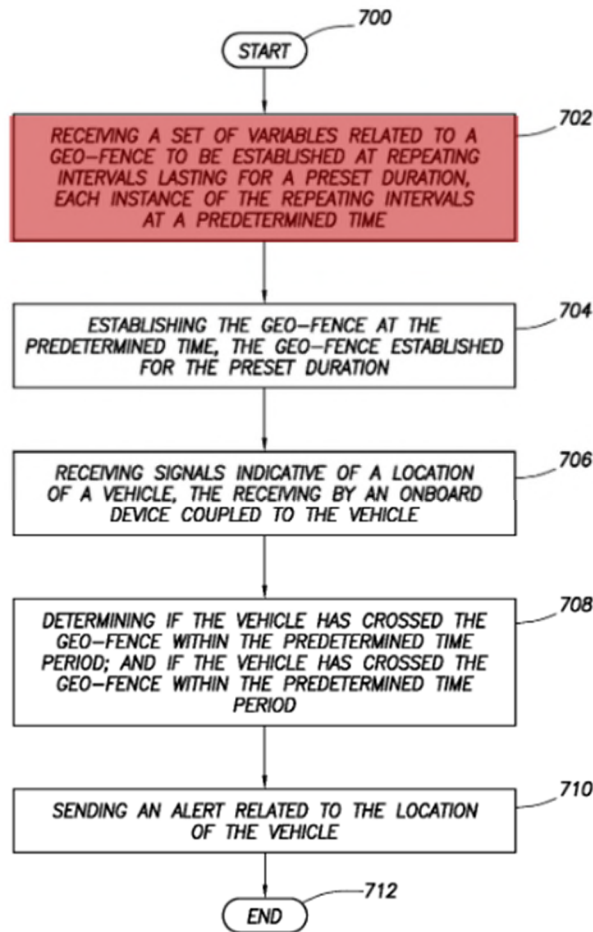


FIG. 7

D. Cronin (EX1007)

Cronin teaches a geo-function setting that sets boundaries relating to when alerts may be presented to a user, and the system may download information from a third-party database regarding one or more geographic locations that are associated with one or more geofences. EX1007, Abstract; 1:14-19; 3:20-23; 6:18-33. Cronin teaches that the geofencing can be a third-party defined location (or route) 136. EX1007, Fig. 1, 3:32-36.

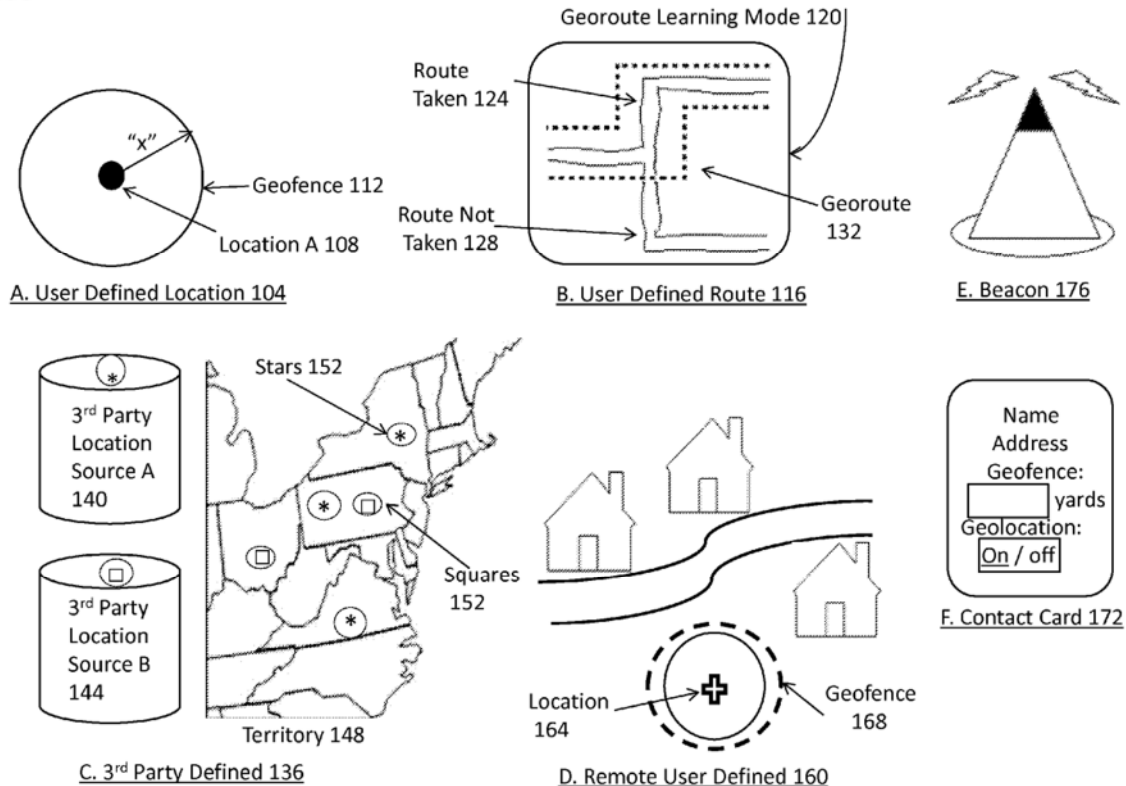


FIGURE 1

Cronin teaches that an example of third-party databases may include “a historical society,” “safety.org,” and “Offenderregistry.org.” EX1007, 5:1-4; 6:18-21.

E. Borugian (EX1008)

Borugian discloses methods for ensuring route adherence and does so by determining whether a “vehicle has deviated from the planned route.” EX1008, 2:56-60. Borugian discloses that the system may detect the vehicle (1) has deviated from a route more than an acceptable deviation radius, or (2) has entered or is approaching

a perimeter around a restricted area. EX1008, 3:34-48; 4:1-12; 12:1-8; 12:38-66. Borugian also discloses controlling a vehicle by defining a perimeter around a restricted area and “[w]hen it is determined that a location of the vehicle is inside the perimeter around the restricted area, the vehicle is shut down.” EX1008, 4:1-4; 1:55-60.

VII. CLAIM CONSTRUCTION

Petitioner respectfully submits that the Board need not expressly construe any term because the prior art invalidates the claims under any plausible construction, in accordance with 37 C.F.R. § 41.100(b).

VIII. ASSERTED GROUNDS 1(A) AND 1(B) OF INVALIDITY: CLAIMS 1-3, 8, 10, 11, 16, 17, 18, 22, AND 23 ARE UNPATENTABLE AS 1(A) ANTICIPATED OR 1(B) OBVIOUS OVER HUMPHRIES.

A. Claim 1

1. [1pre]

To the extent the preamble is limiting, Humphries discloses [1pre]. EX1003, ¶¶87-92. Humphries discloses systems for managing a restriction region. *Id.*; EX1004, Abstract (“A device tracking location adherence and route adherence technology, is disclosed that provides a tracked device receiving, a set of coordinates associated with a boundary area, and obtaining a position of the tracked device.”); 3:58-61 (disclosing “a device tracking system 100 and related components” comprising “tracked devices 120, a data center 140, and a client 160.”).

The systems disclosed by Humphries can manage a restriction region by

creating, editing, and grouping the restriction region. EX1004, 4:26-32 (disclosing that a user, “once the mapping application is accessed,” can create “geofence object(s) that can be associated with the one or more tracked devices 120 (*e.g.*, associated with a vehicle such as an automobile, truck or the like) as boundaries for tracking the movements of the tracked device 120.”); 5:27-29 (“The user can then create and edit the specific geofence in accordance with the user’s desires.”); 7:4-9 (disclosing that the geofence objects “can be grouped in accordance with the user’s wishes”); 1:8-10; 1:44-50 (describing that “geofencing has been utilized . . . to depict areas in which tracked objects *are to be confined*.”).

Humphries discloses that a geofence object is a restriction region as claimed because it corresponds to a geographic region of a map and “*depicts areas in which tracked objects are to be confined*.” EX1004, 1:44-50; 5:23-25; 5:30-34. Humphries describes that a geofence object “is one or more sets of *geographic boundaries* used to monitor tracked device 120.” EX1004, 5:23-25.

Figure 2 illustrates **geofenced objects 220** (annotated below **red**), which represent a region of a map to which fleet vehicles may be confined:

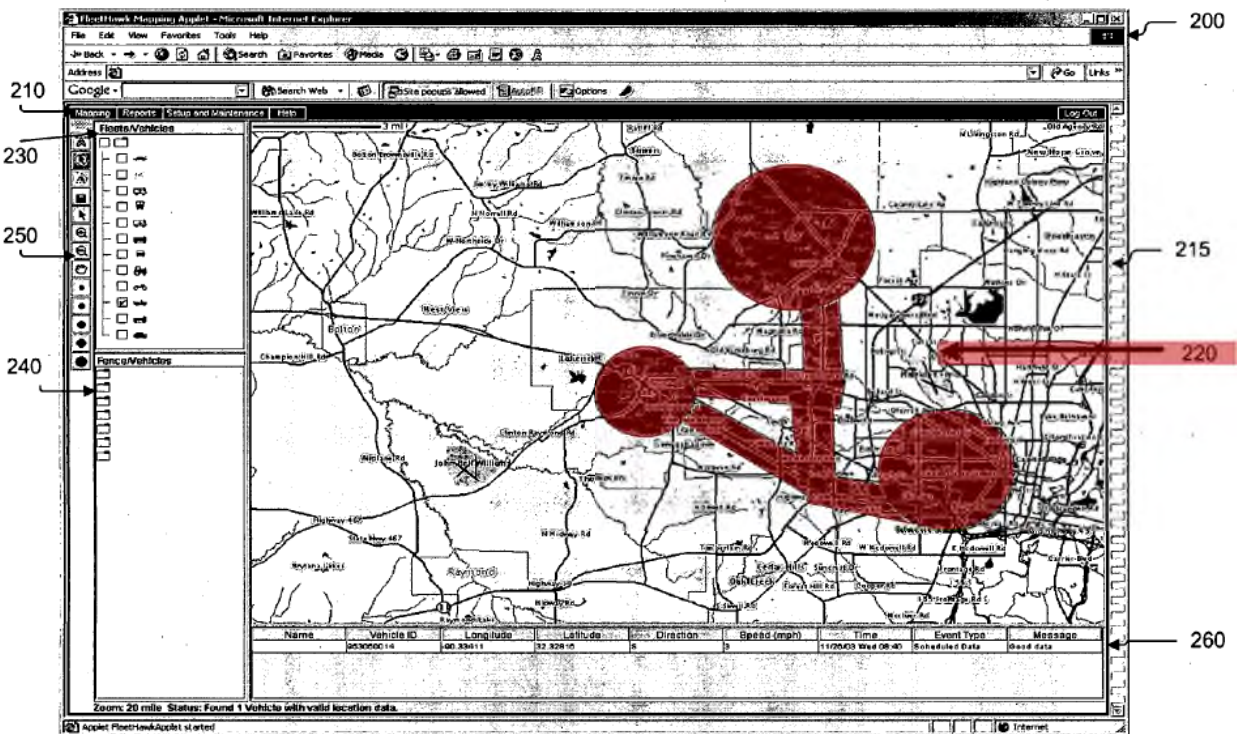


FIG. 2

EX1004, 7:1-3 (“The mapping window 215 shows the current **geofence objects 220** that are associated with the highlighted vehicle”).

Humphries discloses confining vehicles to the region encompassed by the geofence object (*e.g.*, object 220 above) by “ensuring route adherence” of one or more vehicles in a fleet. EX1004, 1:8-12; Figs. 4-6; 8. Humphries ensures route adherence of vehicles to their associated geofences with a “location adherence application 124,” “route adherence application 126,” and “alert generation application 128.” EX1004, 5:61-6:21; Figs. 4-6; 8:1-4; 9:6-8; 9:30-35.

Location adherence application 124 determines whether the tracked device moves “into a geofence object or out of a geofence object boundary since the last

location determination,” while route adherence application 126 “determine[s] if the tracked device is progressing along a predetermined route of geofenced objects.” EX1004, 5:61-6:5. Then, if the geofence object boundary has been violated, “alert generation application 128 acts in concert with transmission hardware . . . to generate and transmit an alert to data center 140 when either the location adherence application 124 or the route adherence application 126 determines that an alert should be sent.” EX1004:6:16-21. Accordingly, Humphries’ geofenced objects disclose the claimed “restriction region.” EX1003, ¶92.

2. [1a]

Humphries discloses one or more processors that are configured to perform the claimed functions. EX1003, ¶¶93-94. For example, Humphries discloses details of computing system 700 employed within tracked device 120, including “processor 903” which executes the “instructions” of tracked device 120. EX1004, 12:14-51. In addition, Humphries discloses a computer system 1000 that implements the data center 140 and the client 160, which can include a “processor 1003” for processing information. EX1004, 12:52-65. The processor 1003 executes “one or more sequences of one or more instructions” and causes the computer system to “perform assigned processing steps of the invention.” EX1004, 13:42-51. Further, one or more processors in a multi-processing arrangement “also can be employed to execute the sequences of instructions” according to Humphries. EX1004, 13:51-54. It would

have been understood and/or obvious to the POSITA that the “instructions” executed by the processors 903 and 1003 correspond to the functions recited in Claim 1, including those recited in claim elements [1b]-[1f], *infra*. EX1003, ¶93.

Therefore, Humphries discloses this claim limitation or at the very least renders it obvious, to the extent it is argued that the one or more processors are not expressly configured to perform the claimed functions. EX1003, ¶94.

3. [1b]

Humphries discloses that the one or more processors are configured to receive one or more parameters of a designated restriction region for a ground vehicle, the one or more parameters being input by a user via a user interface. EX1003, ¶¶95-101. For example, Humphries teaches that the processor 1003 can receive information from “input devices,” such as a keyboard, and a “pointing device,” such as a mouse, using which to interact with a computer user and communicate direction information and command selections. EX1004, 13:7-18. Further, the user can view or interact with the mapping application 150 via a “user interface display,” as depicted in Figure 2 (annotated):

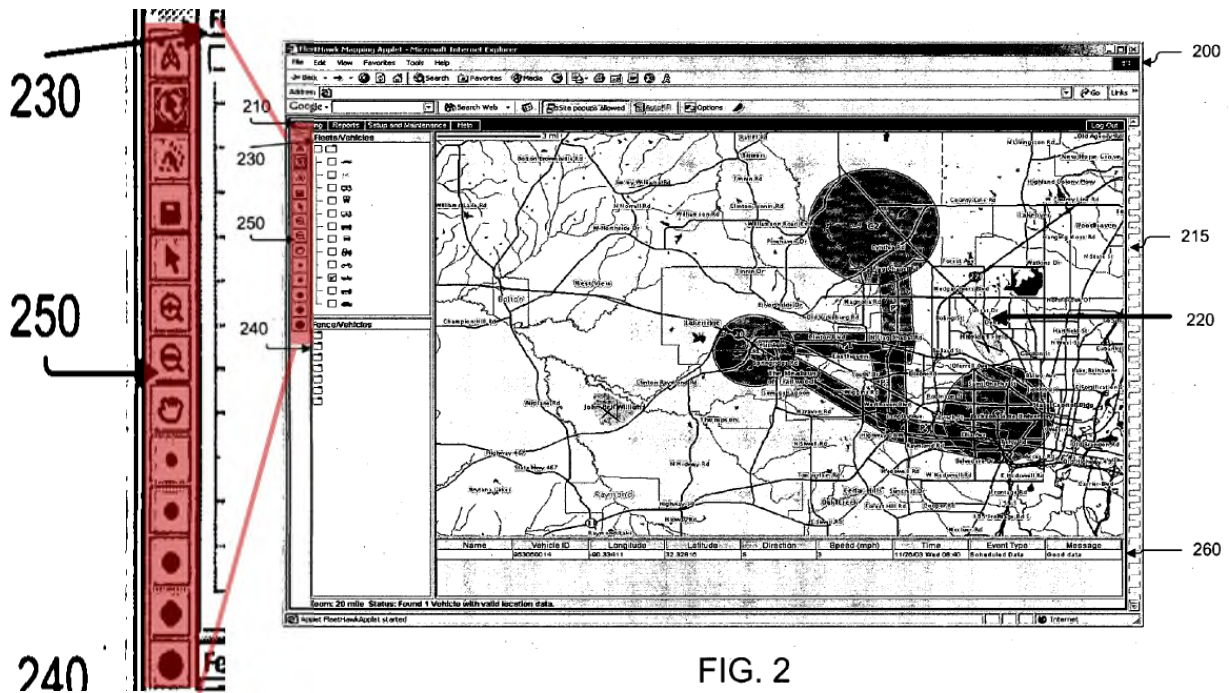


FIG. 2

EX1004, 2:60-62. The user can create and edit the geofence objects by using the mapping application 150. EX1004, 5:18-29. Specifically, the user can input one or more parameters, such as the boundaries of the geofence objects, by using the tools illustrated in the drawing window 250 to draw the boundaries. EX1004, 7:4-6 (The user can “utilize the tools located in the drawing window 250 to create geofence objects in the mapping section 210.”); 5:23-25 (“A geofence object . . . is one or more sets of geographic boundaries used to monitor tracked device 120.”).

The one or more parameters, such as boundaries of the geofence objects, designate a restriction region for a ground vehicle. EX1004, 4:26-32 (geofence object(s) “can be associated with the one or more tracked devices 120 (*e.g.*, associated with a *vehicle* such as an automobile, truck or the like) as boundaries for tracking the movements of the tracked device 120.”); 5:42-46 (The tracked device

120 “is associated with an object that is being tracked,” which “is a vehicle (*e.g.*, cars, boats, trucks, trains)”).

For example, Figure 7A of Humphries “depicts circular geofence 310.” EX1004, 10:20; Fig. 7A (annotated). A POSITA would have understood that the circular shape and the radius R are input by the user to define the boundary of this circular geofence object. EX1003, ¶97.

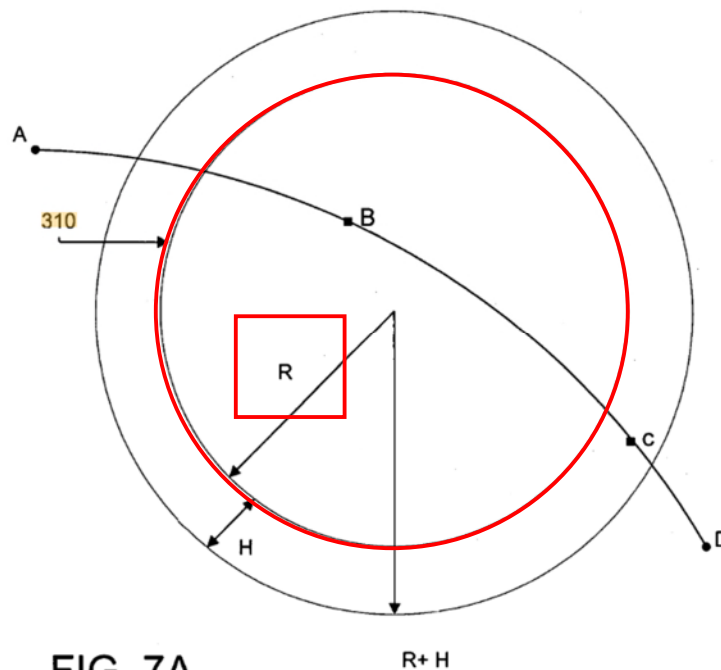


FIG. 7A

Figure 7B of Humphries, as shown below, “depicts [a] polygon geofence 350.” EX1004, 10:49. A POSITA would have understood that points ABCDEFG are input by the user to define the boundary of this polygon geofence object that has an irregular shape.

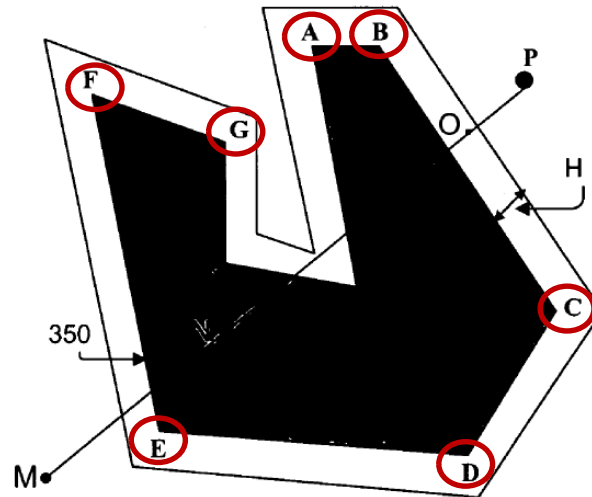
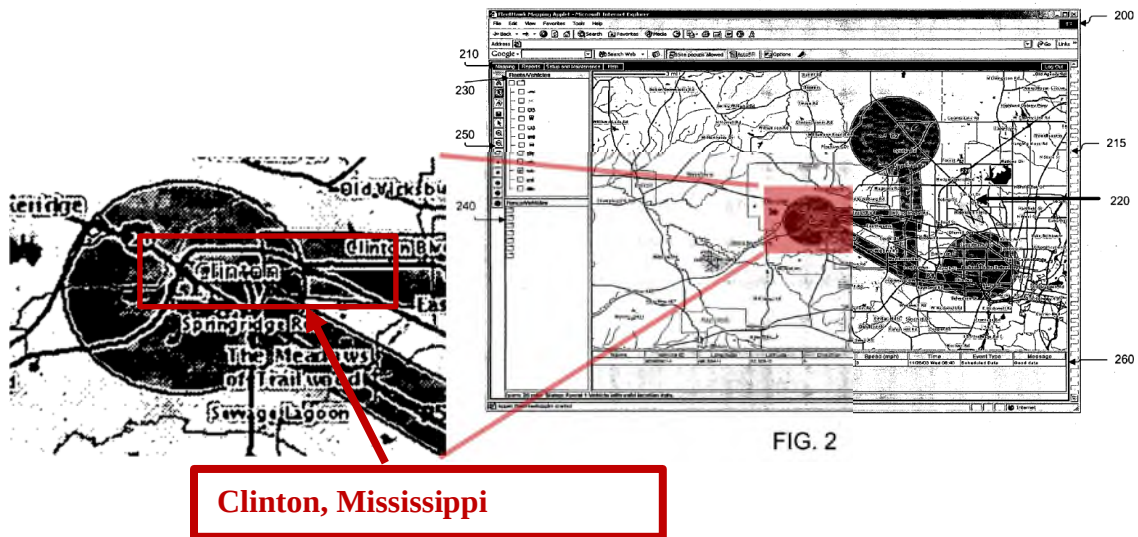


FIG. 7B

EX1004, Fig. 7B (annotated); EX1003, ¶98.

Further, the one or more parameters of the designated restriction region in Humphries include at least a location associated with a private property. EX1003, ¶99. The '121 patent does not define “private property,” although the specification uses “a residential or commercial building” as an example of private property whereas “parks” are given as an example of public property. EX1001, 15:17-19. Thus, Humphries discloses this claim element at least as illustrated in Figure 2, where the geofence objects represent a region on the map that encompasses residential and commercial areas that include at least a location associated with a residential or commercial building—such as those that a POSITA would have understood to exist, for example, within the city of Clinton, Mississippi, illustrated in the figure below. EX1004, Figure 2 (annotated); EX1003, ¶99.



To the extent that Patent Owner contends Humphries does not expressly disclose one or more parameters of the designated restriction region include at least a location associated with a private property, it would have been obvious to a POSITA that Humphries's geofences could be drawn around that kind of property. EX1003, ¶100. The '121 Patent indicates that a property is either a private property or a public property. EX1001, 15:17-19. The geofence objects disclosed by Humphries encompass large urban areas as depicted in Fig. 2 above, and it would have been obvious that these urban areas would include residential homes and commercial business locations, both of which are private according to the '121 Patent. EX1003, ¶100.

Accordingly, Humphries discloses, or at the very least renders obvious, claim element [1b]. EX1003, ¶101.

4. [1c]

Humphries discloses a system authenticating an identify of the user. EX1003, ¶¶102-104. Humphries discloses that the mapping application 150 “can be employed by a user, at client 160, once logged into the data center via the web server 142.” EX1004, 5:18-21. Humphries discloses that “various securities for authentication and authorization can be employed to ensure that only authorized users are accessing the system.” EX1004, 6:35-38. For example, for the user to be authorized to access the mapping application 150, a login screen can be used “where the user enters a username and a password to gain access” and the username and password “are used to authenticate [the identity of] the user.” EX1004, 6:38-42. A POSITA would have understood that the user will not be able to use the mapping application 150 to designate the restriction region without being authorized (“logged into the data center”) to do so, and the user’s identity is authenticated during this process to determine whether the user is authorized to designate the restriction region. EX1003, ¶102.

Humphries further discloses that the one or more processors are configured to perform this step. EX1004, 12:14-51 (disclosing details of computing system 1000 that implements the data center 140 and the client 160, including “processor 1003” for “processing the information” and executing “instructions”). It would have been understood by a POSITA that the “information” may correspond to the user’s

username and password, and the “instructions” may correspond to the authentication function described above. EX1003, ¶103.

Accordingly, Humphries teaches this claim element [1c]. EX1003, ¶104.

5. [1d]

Humphries discloses a system storing the one or more parameters to a database in response to determining the user is authorized. ¶¶105-107. As noted in the above, Humphries teaches that “authentication and authorization can be employed to ensure that only authorized users are accessing” the mapping application 150 to designate the restriction region. §VIII.A.4. A POSITA would have understood that the one or more parameters would and could be stored only if it is determined that the user is authorized to designate the restriction region. EX1003, ¶105. Humphries also teaches that the one or more processors are configured to store the one or more parameters of the designated restriction region, *e.g.*, the boundaries of the geofence objects, to a database. EX1004, 7:9-12 (“once the geofence objects are created, they can be . . . saved to a database in the data center 140.”). As discussed above, it would have been understood by a POSITA that the “instruction” processed by “processor 1003” may correspond to saving the boundaries of the geofence objects to a database in the data center 140. EX1003, ¶105.

Additionally, Humphries also teaches that “[o]nce the geofence objects are

created” after determining the user is authorized to designate them, “the mapping application 150 resolves the boundaries into a set of coordinates” and the set of coordinates can be transmitted and forwarded “to the associated tracked device 120 for storage and use.” EX1004, 5:30-38. A POSITA would have understood that the “processor 903” is configured to store the one or more parameters of the designated restriction region, *i.e.*, the boundaries of the geofence objects represented by the set of coordinates, to a database within the tracked device 120 where the coordinates are stored. EX1003, ¶106.

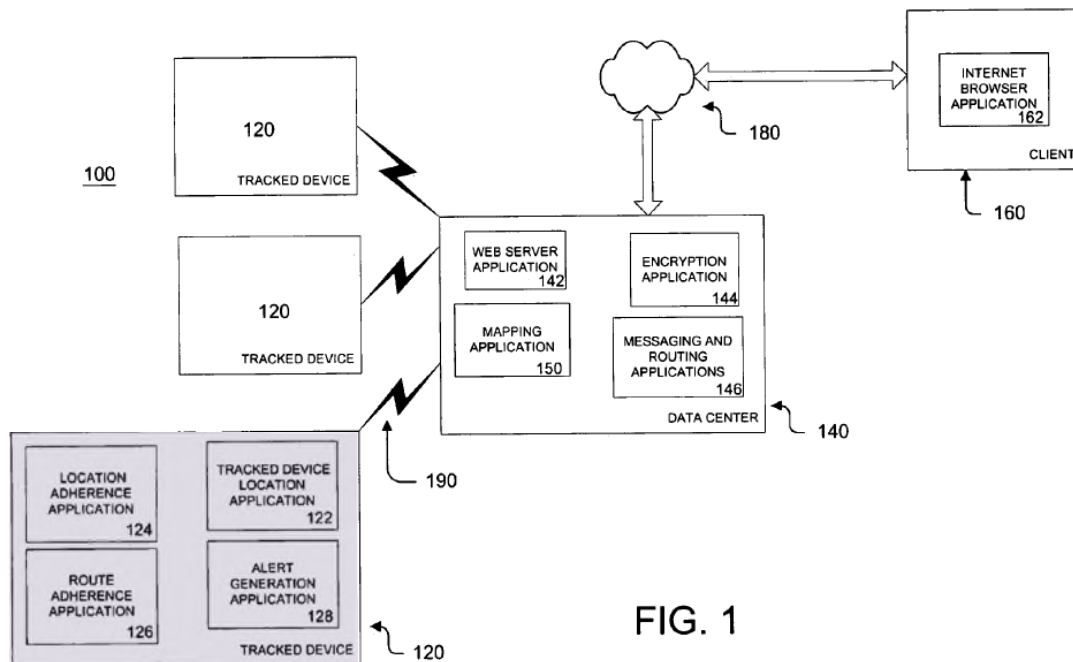
Accordingly, Humphries discloses the limitations of [1d]. EX1003, ¶107.

6. [1e]

Humphries discloses a system associating one or more response measures with the restricted region based on the parameters. ¶¶108-112. Humphries discloses that the tracked device 120 is configured to send an alert if it is determined that the device’s status has changed with respect to being inside or outside the boundary of the geofence object (designated restriction region). EX1004, at 3:33-39; 5:39-44; 6:2-5; 6:12-15; 6:18-32; 11:13-17. Providing an alert is one of the claimed response measures. EX1001, Claim 1 (claiming that the one or more response types are implemented by at least “providing an alert”).

As disclosed in Figure 1 (annotated below), tracked device 120 includes various applications, including location adherence application 124, route adherence

application 126, and alert generation application 128:



Humphries discloses that after receiving the coordinates of a geofenced object, “a determination is made as to whether the tracked device is located inside the boundary area or outside the boundary area. An alert signal is then generated and transmitted if the result of the determining is different from an immediately previously obtained result.” EX1004, 3:33-39. Humphries thus discloses associating the generation of an alert with the geofence object based on the boundaries of the designated restriction region. EX1003, ¶110.

For example, “if the object has moved into or out of a geofence object, the alert generation application is able to send an alert message to the data center 140.” EX1004, 6:3-6. As another example, “if the object is determined to not be moving

in accordance with the predetermined route of geofence objects, the alert generation application is able to send an alert message to the data center 140.” EX1004, 6:12-15. More specifically, the **alert generation application 128** (shown above to be part of tracked device 120), “acts in concert with transmission hardware . . . to generate and transmit an alert to datacenter 140 when either the location adherence application 124 or the route adherence application 126 determines that an alert should be sent.”

Additionally, Humphries discloses details of computing system 700 employed within the tracked device 120, including “processor 903” for “processing the information” and executing “instructions.” EX1004, 12:14-25. It would have been understood to the POSITA that the “instructions” correspond to the functions performed by the location or route adherence applications and the alert generation application described above, such as generating an alert after determining whether the tracked device is located inside or outside the boundary of the geofence object. EX1003, ¶112. Therefore, Humphries discloses claim element 1[e] by teaching that the one or more processors are configured to associate the alert message with the geofence object based on its boundaries. EX1003, ¶¶108-112.

7. [1f]

Humphries teaches a system implementing at least one of the response measures in the claimed Markush group, “providing an alert.” *See Fresenius USA*,

v. Baxter Int'l, 582 F.3d 1288, 1297-98 (Fed. Cir. 2009) (“the entire element is disclosed by the prior art if one alternative in the Markush group is in the prior art.”); *Cisco Systems, Inc. v. WSOU Investments Inc.*, IPR2021-01117, Paper No. 28, at 26 (PTAB Jan. 5, 2023) (finding a prior art disclosure of element “[A]” disclosed entire Markush group recited as “at least one of [A], [B], and [C]”); EX1003, ¶¶113-117.

As discussed above, Humphries discloses that the one or more processors are configured to implement the one or more response measures, *e.g.*, “providing an alert,” if it is determined that the device’s status has changed with respect to being inside or outside the boundary of the geofence object (designated restriction region). §VIII.A.6. To the extent that Patent Owner argues the claim requires the alert be actually used to affect operation of the vehicle (*e.g.*, by the vehicle operator receiving the alert), such an interpretation would be requiring an intended result or purpose of the alert and thus should not be required by this limitation. Regardless, a POSITA would have understood, or at least found obvious, that when a user of a vehicle is provided with an alert regarding the operation of the vehicle within a restriction region, such an alert would cause the vehicle operator to change the operation of the ground vehicle to comply with the alert. §VIII.A.3; EX1003, ¶114.

Humphries further discloses that an alert is provided when the ground vehicle moves into a geofence object. EX1003, ¶115. For example, Humphries discloses that if the tracked device is determined to be inside the geofence object(s), and the

previous location is outside the geofence object(s), then the location adherence application 124 “concludes that the tracked device has changed status by moving inside a geofence group,” and the alert generation mechanism 128 will generate and transmit an alert message to the data center 140. EX1004, 8:30-42; 8:60-9:5.

Alternatively, Humphries discloses that an alert is provided when the ground vehicle leaves a geofence object. EX1003, ¶116. For example, the route adherence application can monitor the tracked device as it travels a specific route of geofence objects, and an alert is generated when it is determined that the traced device has left the geofence object. EX1004, 11:18-12:3. Thus, Humphries discloses that an alert is provided when the tracked device, which is associated with a ground vehicle, diverts from the specific route, leaves the geofence objects, and becomes near the designated restriction region. EX1003, ¶116.

Accordingly, Humphries discloses claim element [1f]. EX1003, ¶117.

B. Claim 2

Humphries discloses a system displaying the designated restriction region at the user interface. EX1003, ¶¶118-19. As discussed in §VIII.A.3, the user can view or interact with the mapping application 150 via a “user interface display,” where the designated restriction region (the **geofence objects**) is displayed as shown in Figure 2 (annotated):

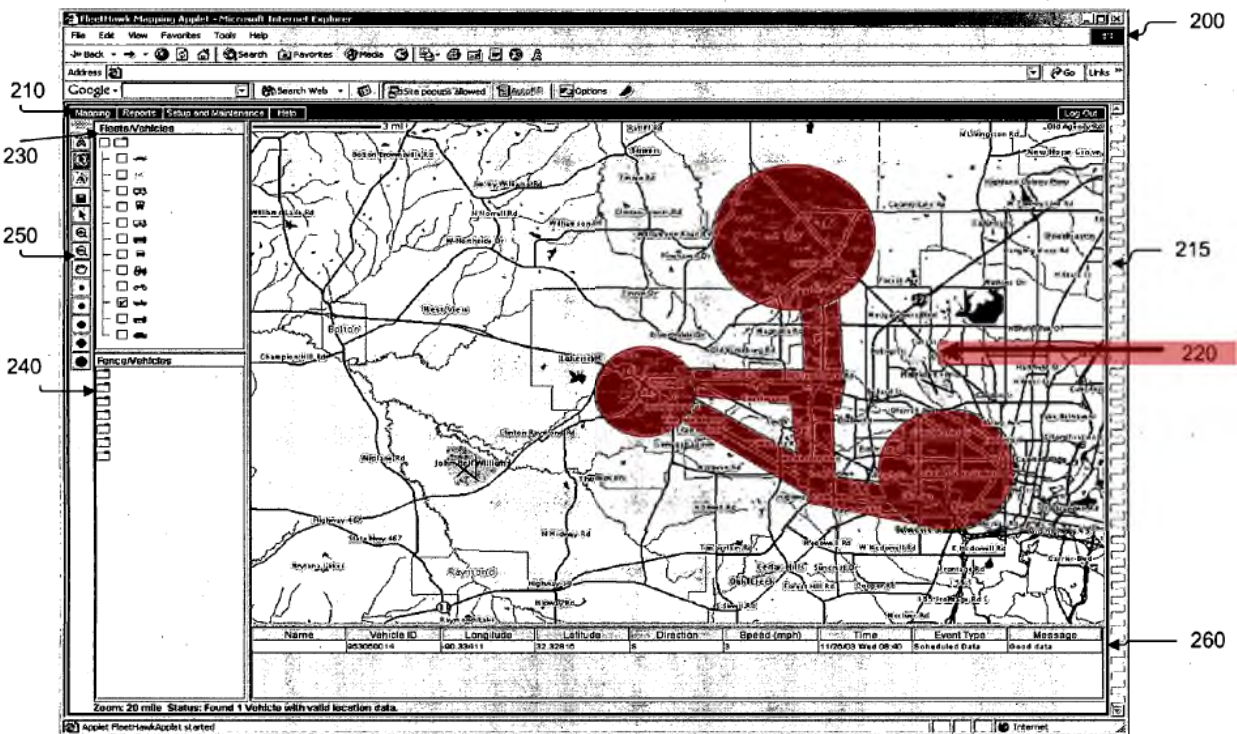


FIG. 2

A POSITA would have understood that the processor 1003 of Humphries is configured to execute the instructions correspond to the functions performed by the mapping application 150 to display the designated restriction region. EX1003, ¶119. Therefore, Humphries discloses Claim 2. *Id.*

C. Claim 3

1. [3a]

Humphries discloses implementing a response measure when it is determined that the ground vehicle is unauthorized. See §VIII.A.7. For example, an alert message was sent to the data center 140 when it is determined that the ground vehicle has left the geofence object. EX1004, 11:18-12:3. A POSITA would have

understood that when the tracked device 120 is tracked in accordance with the route adherence application 126, the ground vehicle is only authorized to traverse a specific route of geofence objects. EX1003, ¶120. When the ground vehicle leaves the geofence objects, it becomes an unauthorized ground vehicle and an alert will be generated when the ground vehicle is determined to be unauthorized. *Id.*

2. [3b]

Humphries discloses that the ground vehicle is allowed to operate when it is determined that the vehicle is within the geofence objects (designated restriction region). *See, e.g.*, EX1004, 11:54-56 (“once inside the first geofence object, the tracked device is merely being monitored to determine if it has exited the geofence object”); EX1003, ¶121. A POSITA would have understood that a vehicle is an authorized ground vehicle when it is allowed to operate within the designated restriction region. *Id.* Accordingly, Humphries discloses Claim 3. *Id.*

D. Claim 8

See claim element [1c] above. Humphries discloses that “various securities for authentication and authorization can be employed to ensure that only authorized users are accessing the system,” and one of the authentication methods is “where the user enters a username and a password to gain access,” with user entry of a password being one of the claimed Markush group alternatives. EX1004, 6:35-42. Therefore, Humphries discloses Claim 8. EX1003, ¶122.

E. Claim 10

The '121 Patent does not provide a definition of “a temporary database.” To the extent that this term is not indefinite and has met the written description and enablement requirements, a POSITA would have understood that “a temporary database” can be a database that stores data temporarily or whose data can otherwise be updated (*e.g.*, constantly). EX1003, ¶123. This is supported by the '121 Patent. See EX1001, 13:54-57 (“The platform may comprise one or more databases that can be constantly updated by various users that input and update flight restricted regions and/or parameters associated with the flight restriction regions.”); 16:7-9 (“The database may constantly be updated with user inputs or information regarding flight restriction regions acquired via other means.”); 29:20-21 (“The database may be constantly updated through the user of such software.”); 34:48-49 (“The database may be constantly updated.”).

Humphries discloses such a database. EX1003, ¶124. As discussed in §VIII.A.5, Humphries teaches that the boundaries of the geofence objects can be saved to a database in the data center 140, and a set of coordinates of the boundaries may be stored in a database within the tracked device 120. EX1004, 5:30-38; 7:9-12. Humphries also discloses that the user can “create and *edit* the specific geofence in accordance with the user’s desires.” EX1004, 5:27-29. A POSITA would thus have understood that the databases disclosed in Humphries are temporary because

they will be constantly updated whenever a user edits the geofence objects. EX1003, ¶124. Further, Humphries discloses that the main memories 905 or 1005 “can be used for storing temporary variables or other intermediate information during the execution of instructions by the processor.” EX1004, 12:26-29; 12:66-13:2. A POSITA would have understood that these temporary variables or other intermediate information taught by Humphries can also be stored within temporary databases. EX1003, ¶124. Therefore, Humphries discloses Claim 10. *Id.*

F. Claim 11

The '121 Patent does not define the terms “private database” and “public database.” Humphries discloses that a user can only privately access the “system,” including the database, after the user is authenticated and granted access when the user inputs the username and password. *See* EX1004, 6:35-42; §VIII.D. Therefore, a POSITA would have understood that Humphries discloses Claim 11 by teaching that the database is a private database that is privately accessible with granted access. EX1003, ¶125.

G. Claim 16

1. [16a]

See Elements [1a] and [1b] above. Humphries discloses the one or more processors, a first user, and the one or more first parameters. EX1003, ¶126.

2. [16b]

Humphries teaches a second user because “the client 160 can include multiple

individual users located on individual workstations.” EX1004, 4:31-33. Humphries also teaches that the second user can be “set up to access the applications provided by the data center 140.” EX1004, 4:33-36. A POSITA would have understood that one or more second parameters of the designated restriction region can be input by the second user via applications such as the mapping application 150. EX1003, ¶127. For example, a POSITA would have understood, and at the very least found it obvious, that the second user would input different parameters than the first user—*e.g.*, parameters for a new geofence or parameters modifying an existing geofence. *Id.* A POSITA would also have understood that the one or more processors are further configured to receive the one or more second parameters. §VIII.A.3; EX1003, ¶127. Accordingly, Humphries discloses this claim element. *Id.*

3. [16c]

As discussed in §VIII.A.4, Humphries discloses the authentication of users using a username and password. As with the user of Claim 1 (the “first user”), the one or more processors of Humphries are configured to authenticate the identity of the second user as well to determine whether the second user is authorized to designate the restriction region. EX1003, ¶128. Accordingly, Humphries discloses this claim element and Claim 16. *Id.*

H. Claim 17

1. [17a]

Humphries discloses a system determining the degree or type of the first and

second users' authentication based on their identities. EX1003, ¶129. Humphries discloses that "one would understand that additional authorization schemes could be set up, for example, so that a specific process or person may only access or modify data that he/she has been authorized to process." EX1004, 6:42-45. A POSITA would thus have understood that the first user and the second user may access or modify data based on their identities under the "additional authorized schemes" disclosed by Humphries. EX1003, ¶129. A POSITA would have further understood that Humphries discloses this element because the one or more processors are configured to determine the degree or type of authentication. *Id.*; §VIII.A.4.

2. [17b]

Humphries discloses or renders obvious the system aggregating the parameters based on the users' degree or type of authentication. ¶¶130-132. Humphries discloses the first user and the second user may only access or modify data based on the degree or type of their authentication, *e.g.*, "data that he/she has been authorized to process." §VIII.H.1. A POSITA would have understood that the data that the users are authorized to process can be, for example, the geofence objects drawn on different areas of a map accessible to the users determined by the degree or type of their authentication. EX 1003, ¶130.

Further, Humphries discloses that the geofence objects "can be created in a separate, stand-alone, manner or can be grouped together in various combinations of

objects.” EX1004, 7:30-35; *see also* 7:6-9 (“the geofence objects can . . . be grouped in accordance with the user's wishes”); 7:55-68 (“the user can decide to group two or more geofence objects together in any manner deemed appropriate by the user”). A POSITA would thus have understood that the first user and the second user may create separate geofence objects in the area that they are authorized to do so, and these separate geofence objects can be grouped—in other words, the boundaries of the geofence objects can be aggregated—to form one or more geofence groups “in any manner deemed appropriate by the user.” EX1003, ¶131. A POSITA would have understood, or at least found it obvious, that two users that are authorized to access the same database of geofences because they have the same degree or type of authentication would have their created geofences aggregated together in that same database. *Id.*

A POSITA would have further understood that the one or more processors are configured to perform this aggregation function to generate the boundaries of the geofence groups, *i.e.*, the one or more aggregated parameters. EX1003, ¶132. Accordingly, Humphries discloses or renders obvious this claim element. *Id.*

3. [17c]

See §VIII.A.5. A POSITA would have understood that because the one or more processors are configured to store the one or more parameters of the designated restriction region to the database, Humphries also discloses that the one or more

processors are configured to store the one or more aggregated parameters discussed in §VIII.H.2. EX1003, ¶133. Humphries thus discloses this element and Claim 17. *Id.*

I. Claim 18

Claim 18 is almost identical to Claim 1 except for the differences discussed below. EX1003, ¶134.

1. [18pre]-[18a]

Humphries discloses a system for managing a restriction region comprising a non-transitory computer readable medium. ¶¶135-137. Humphries discloses a system for managing a restriction region. See §VIII.A.1. Humphries also discloses that the computer system 900 includes a data memory 905 and the computer system 1000 includes a main memory 1005, examples of both include “a random access memory (RAM), other dynamic storage devices (*e.g.*, dynamic RAM (DRAM), static RAM (SRAM), synchronous DRAM (SDRAM)), flash memory, etc.,” coupled to the bus “for storing information and instructions to be executed by the processor.” EX1004, 12:19-25; 60-65. A POSITA would thus have understood that the data memory 905 and the main memory 1005 are the claimed non-transitory computer readable medium having instructions that when executed perform the recited functions. EX1003, ¶135.

Further, Humphries teaches that “computer readable medium” can refer to

“any medium that participates in providing instructions to the processor 1003 for execution.” 14:18-20. Such a medium “can take many forms” that may include non-volatile media, volatile media, and transmission media, and the various forms of computer-readable media that “can be involved in providing instructions to a processor for execution.” 14:20-29. Therefore, a POSITA would have understood that Humphries discloses the claimed non-transitory computer readable medium having instructions to be executed. EX1003, ¶136.

Accordingly, Humphries discloses claim elements [18pre]-[18a]. EX1003, ¶137.

2. [18b]

Humphries discloses that the non-transitory computer readable medium has instructions that, when executed, receives one or more parameters of a designated restriction region for a ground vehicle, the one or more parameters being input by a user via a user interface. *See* §VIII.A.3. Because Humphries discloses that the designated restriction region includes at least a location associated with a private property, a POSITA would have understood that the received parameters for the designated restriction region would have been parameters of a private property on which a ground vehicle operates. *Id.*; EX1003, ¶138.

To the extent it is argued that Humphries does not expressly disclose this claim element, it would have been obvious for a POSITA that a restriction region

can be designated for a ground vehicle operating on private property. EX1003, ¶139. The '121 Patent indicates that a property is either a private property or a public property. EX1001, 15:17-19. Therefore, a POSITA would have understood that the geofence objects disclosed in Humphries can encompass a restriction region that include either public properties, private properties, or both. EX1003, ¶139. A POSITA would thus have found it obvious that a restriction region can be designated for a ground vehicle operating on private property. *Id.*

Accordingly, Humphries discloses or renders obvious this claim limitation. EX1003, ¶140.

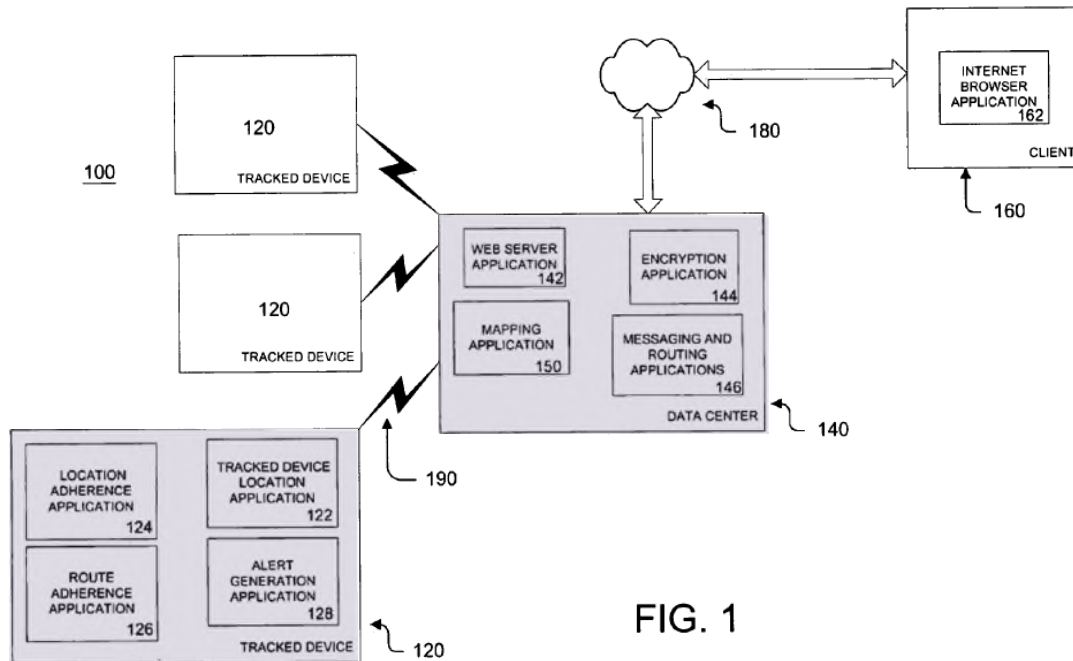
3. [18c]-[18f]

These claim limitations are substantively identical to those of claim 1, and are disclosed for the same reasons. *See* §§VIII.A.4-7; EX1003, ¶141. Further, as discussed above, a POSITA would have understood that a non-transitory computer readable medium having instructions that, when executed, would perform these claimed functions. *See* §VIII.I.1; EX1003, ¶141. Therefore, Humphries discloses claim elements [18c]-[18f] and Claim 18. *Id.*

J. Claim 22

The '121 Patent does not explain how a computer readable medium “directs an application hosted on a platform.” As discussed in §VIII.I.1, Humphries discloses memories 905 and 1005 for storing information and instructions to be executed by

the processor. To the extent that this claim is not indefinite and has met the written description and enablement requirements, a POSITA would have understood that the instructions to be executed by the processor include directing the functional applications such as the mapping application 150 and the route adherence application 126. EX1003, ¶142. Humphries also discloses that these applications are hosted on a platform, which is either the data center 140 or the tracked device module 120. *See* EX1004, Fig. 1 (annotated below); *see also* EX1004, 4:37-40 (“The data center 140 can include various functional applications including, for example, a web server application 142, a data encryption application 144, messaging and routing applications 146 and a mapping application 150.”); 5:39-42 (“The tracked device module 120 includes a tracked device location application 122, a location adherence application 124, a route adherence application 126, and an alert generation application 128.”).



Accordingly, Humphries discloses Claim 22. EX1003, ¶¶142-43.

K. Claim 23

Humphries teaches that the instructions, when executed, receive the one or more parameters being input by the user on the user interface. *See* §VIII.I.1; *see also* EX, 1004, Fig. 2.

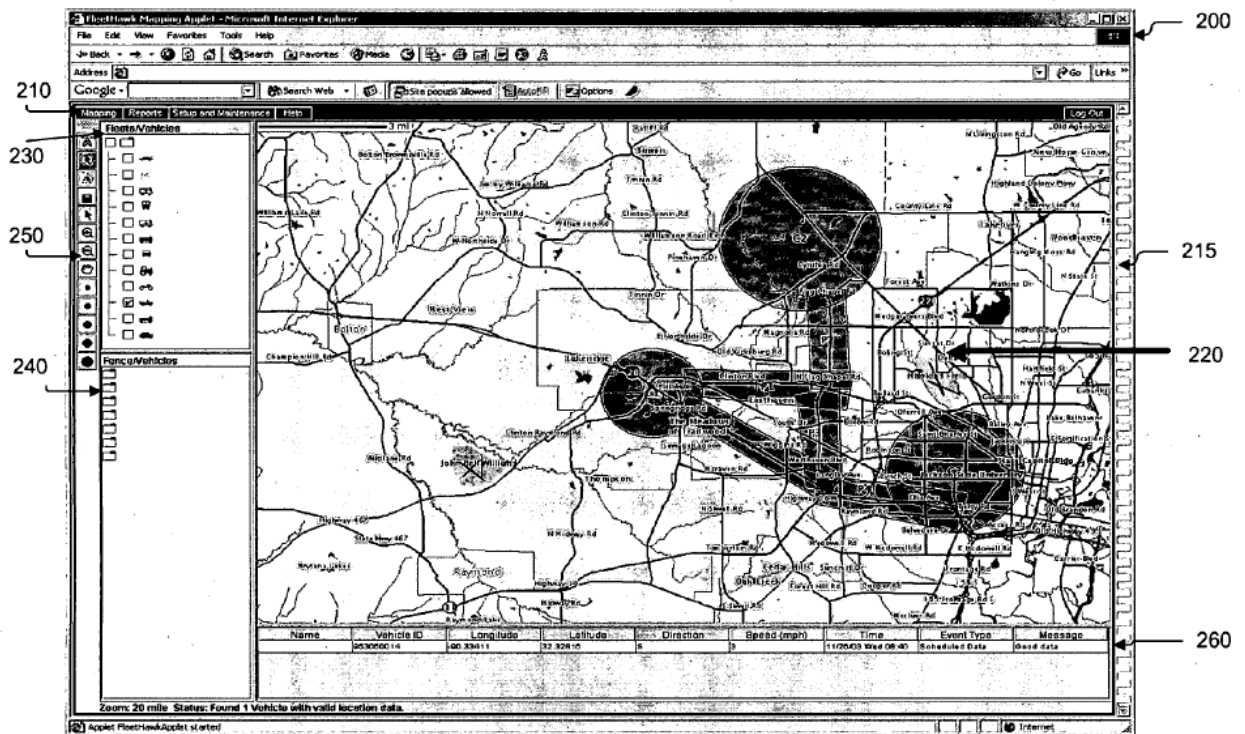


FIG. 2

Humphries teaches that the user can create and edit the specific geofence by using the mapping application 150, which “provides geographical maps of locations.” EX1004, 5:25-29. The geofence objects can either be circular or polygons or “other shapes such as ellipses” that can be employed to define a geofence object. EX1004, 7:6-16. The geofence map is superimposed on a geographical map in the geographical map window 215. EX1004, 6:49-52. Therefore, a POSITA would have understood that a user can create the geofence by tracing the boundaries of the desired area on the geographical map, as shown in Figure 2 where the geofences are created via the user tracing the boundaries of the cities and roads. EX1003, ¶145. A POSITA would have also understood, or at least

found it obvious, that the user can trace on the geographical map window 215 to obtain the boundaries of the geofence objects “in accordance with the user’s wishes.”

Id.

Accordingly, Humphries teaches or renders obvious Claim 23. EX1003, ¶146.

IX. ASSERTED GROUND 2 OF INVALIDITY: CLAIMS 1-3, 8-11, AND 16-23 ARE UNPATENTABLE AS OBVIOUS OVER HUMPHRIES IN LIGHT OF MARCUS.

Ground 1, demonstrating that Humphries discloses or renders obvious the elements of Claims 1-3, 8, 10, 11, 16-18, 22, and 23, is incorporated herein by reference. *See* §VIII, above.

A. Rationale and Motivation to Combine

Humphries discloses systems receiving one or more parameters input by a user designating a restriction region for a vehicle and determining whether a tracked device is located within or near the boundary of the restriction region. EX1004, 2:4-12; 5:18-29. Humphries also explains that “the present invention” can be employed with “airborne vehicles.” EX1004, at 7:21-23. Similarly, Marcus discloses systems receiving location information from a user associated with a property such as a private property, creating a restriction region around the private property based on the received location information, and determining whether and/or when a drone is allowed in the restriction region based on further information specified by the user (*e.g.*, allowed types of drones or allowed times of access). EX1005, abstract; [0022];

EX1011, abstract; [0010]. A POSITA would have found it obvious to modify Humphries's one or more parameters of the designated restriction region to include location information and additional restriction information relating to a private property, enabling more functionality with respect to controlling the boundary of the restricted region. EX1003, ¶148.

A POSITA would have been motivated to combine Humphries and Marcus because such a combination would apply a known technique to a known device ready for improvement to yield predictable results. EX1003, ¶149; *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007). For example, the known technique taught by Marcus "aggregate[s] the privacy preferences and/or access rights published and/or requested by many individuals and/or entities, and disburse[s] those preferences and/or rights to many nodes, for example drones." EX1005, [0020]; EX1011, [0008]. Humphries teaches that its system can transmit the boundary information of the restriction region to the "associated tracked device 120 for storage and use." EX1004, 5:30-38. Therefore, a POSITA would have been motivated to apply Marcus's known technique of disbursing privacy preferences of private property owners, such as designating a private property as the restriction region, to Humphries's known device. EX1003, ¶149. Because Humphries already teaches that its system can transmit the information of the restricted region, they are ready for the improvement to include the user's privacy preferences to yield predictable

results. *Id.* As another example, Marcus teaches to verify ownership or control of the property. EX1005, [0017]; EX1011, [0005]. Humphries teaches to authenticate the user's identity. EX1004, 6:35-38. A POSITA would thus have been motivated to apply Marcus's known technique of private property ownership or control verification to Humphries's known authentication step when being used to create a geofence encompassing private property, which is ready for improvement to include the additional verification step to yield predictable results. EX1003, ¶149.

Further, a POSITA would have recognized Marcus's location and further restriction information, such as information identifying the property as a private property, would have provided the same benefit to Humphries as is taught by Marcus—preventing an airborne vehicle (a drone) from trespassing, violating property rights, or otherwise accessing prohibited areas. EX1005, [0017]; EX1003, ¶150. The POSITA would have recognized the benefit of providing such information regarding private property, which would have helped to efficiently depict areas in which tracked objects are to be confined. EX1004, 1:45-46; EX1003, ¶150. This would have had the predictable result of the one or more processors in Humphries receiving one or more parameters of the designated restriction region including at least a location associated with a private property and would have been well-within the skill of a POSITA to do so. *Id.*; *KSR*, 127 S.Ct. at 1739 (“The combination of familiar elements according to known methods is likely to be obvious when it does

no more than yield predictable results.”).

B. Reasonable Expectation of Success

The POSITA would have had a reasonable expectation of success, as the combination of references discussed above would have merely involved the addition of the user’s privacy preferences related to the user’s private property and/or the step of verifying the user’s ownership or control of the private property. EX1003, ¶151. Doing so would have involved, for example, merely modifying the mapping application 150 to have the user further verify her identity and designate a restriction region that includes the user’s private property. *Id.*

C. Claim 1

1. [1pre]-[1a]

Humphries discloses claim limitations [1pre]-[1a] for the same reasons above regarding Ground 1, [1pre]-[1a].

2. [1b]

Humphries anticipates or renders obvious limitation [1b] for the same reasons above. §VIII.A.3.

Alternatively, Marcus discloses the one or more parameters of the designated restriction region include at least a location associated with a private property. EX1003, ¶154. For example, Marcus discloses a database that allows a user to specify a restricted location that can include “land that any particular person or entity controls, for example a city, park authority, or a private property.” EX1005, [0014];

EX1011, Appendix. Marcus also discloses that users “may prevent, control, calibrate, or monitor [the drone’s] access to a private area and/or a controlled area.” EX1005, [0017]; EX1011, [0005].

To the extent it is argued that this claim element requires an association of the location with private property be included in the one or more parameters, a POSITA would have understood, or at least found it obvious, that Marcus teaches this claim element. EX1003, ¶155. When a restricted location that includes a private property is input by the user and received by the processor, that location information, including the information that the location is associated with private property, is included in the one or more parameters. *Id.*

It would have been obvious to a POSITA to include the location associated with a private property in the one or more parameters configured to receive by the one or more processors of Humphries. §§IX.A-B; EX1003, ¶156. For example, it would have been apparent to the POSITA that to the extent that a user desires a geofence object encompassing a location that is a private property as taught by Marcus, that information can be input by the user and received by the one or more processors of Humphries. *Id.* It would also have been obvious to a POSITA that the one or more processors would receive not only the location information, but also the information that the location is associated with a private property. *Id.* Humphries in view of Marcus thus renders obvious limitation [1b]. *Id.*

3. [1c]-[1f]

Humphries discloses claim limitations [1c]-[1f] for the same reasons above regarding Ground 1, [1c]-[1f]. Therefore, Humphries in light of Marcus renders obvious Claim 1. EX1003, ¶157.

D. Claims 2, 3, and 8

Humphries discloses Claims 2, 3, and 8 for the same reasons above regarding Ground 1, Claim 2, 3, and 8. *See* §§VIII.B-D. Therefore, Humphries in view of Marcus renders obvious Claims 2, 3, and 8. EX1003, ¶158.

E. Claim 9

Humphries in view of Marcus discloses at least one of the options set forth by Claim 9, rendering the entire Markush group invalid. *Fresenius*, 582 F.3d at 1297-98; *Cisco Systems*, IPR2021-01117, Paper No. 28, 26; EX1003, ¶¶159-60. Humphries discloses that the one or more processors are configured to authenticate an identity of the user to determine whether the user is authorized to designate the restriction region. §VIII.A.4. Marcus discloses that users “may prevent, control, calibrate, or monitor [the drone’s] access to a private area and/or a controlled area.” EX1005, [0017]; EX1011, [0005]. And users “may be required to verify ownership or control of the property” to input address or location information of the private property into a database. *Id.* Therefore, Marcus discloses that the user is authorized to designate the restriction region when the identity of the user is at least authenticated as an owner. EX1003, ¶159.

It would have been obvious to a POSITA to further configure the processor in Humphries to identify whether the user is authenticated as an owner as taught by Marcus. §VIII.A.4; §§IX.A-B; EX1003, ¶160. Humphries in view of Marcus renders obvious Claim 9. *Id.*

F. Claim 10

Humphries discloses Claim 10. *See* §VIII.E. As discussed above, the '121 Patent does not define the term “temporary database.” *Id.* The '121 Patent merely states that “[a] flight-restricted region may be a permanent no-fly zone or may be a temporary area where flights is prohibited” and “[t]he flight restriction region may exist[] for a period of time.” EX1001, 2:45-46; 15:30-32. Marcus discloses the same temporary flight restriction region. EX1005, [0062] (“the drone can receive parameters for any given area for exclusion on TFR (temporary flight restrictions) transmitted to database. Thus, the database can include both permanent entries and temporary entries (transient restrictions).”); EX1011, Appendix A.

It would have been obvious to a POSITA to further configure the database in Humphries to store temporary data as taught by Marcus. EX1003, ¶162; §§IX.A-B. Therefore, Humphries in view of Marcus renders obvious Claim 10. EX1003, ¶¶161-62.

G. Claims 11, 16, and 17

Humphries discloses Claims 11, 16, and 17 for the same reasons above

regarding Ground 1, Claim 2, 3, and 8. *See* §§VIII.F-H. Therefore, Humphries in view of Marcus renders obvious Claims Claims 11, 16, and 17. EX1003, ¶163.

H. Claim 18

1. [18pre]-[18b]

Humphries anticipates or renders obvious limitations [18pre]-[18b] for the same reasons above. §VIII.I.1.

Alternatively, Marcus discloses the one or more parameters of a designated restriction region for an airborne vehicle operating on private property. EX1003, ¶165. For example, Marcus discloses that “certain types of passage by a drone over private property may be permitted by a user designating the area a configurable flight zone area.” EX1005, [0022]; EX1011, [0010]. Marcus teaches that as an example, “a user may allow drones delivering packages to land and take off from the property when delivering packages there.” *Id.* As another example, Marcus teaches that the drone can be allowed to “fly over the location,” which could include “a private property,” at a specific time interval. EX1005, [0014], [0042]; EX1011, Appendix A. A POSITA would have understood that the user’s command allowing drones operating on private property, *e.g.*, delivering packages and taking off from the private property, is among the one or more parameters input by the user via a user interface and received by the system when executing instructions saved on the non-transitory computer readable medium. EX1003, ¶165.

It would have been obvious to a POSITA to modify the disclosed one or more parameters of the designated restriction region for a ground vehicle in Humphries so that the vehicle operates on private property as disclosed in Marcus. §§IX.A-B; EX1003, ¶166. Humphries in view of Marcus thus renders obvious these claim limitations. *Id.*

2. [18c]-[18f]

Humphries discloses claim limitations [18c]-[18f] for the same reasons above regarding Ground 1, [18c]-[18f]. Therefore, Humphries in view of Marcus renders obvious Claim 18. EX1003, ¶167.

I. Claim 19

See above §§IX.E, H. Marcus discloses that users “may be required to verify ownership or control of the property.” EX1005, [0017].

Therefore, Humphries in view of Marcus renders obvious Claim 19. EX1003, ¶¶168-69.

J. Claim 20

Humphries in view of Marcus renders obvious the identity of the user is a renter of the private property. EX1003, ¶170. Marcus discloses that “property owners or other responsible parties” may control the airborne vehicle’s access to a private area. EX1005, [0017]; EX1011, [0005]. And users “may be required to verify ownership or control of the property” to input address or location information of the private property into a database. *Id.* Therefore, a POSITA would have found obvious

that the identity of the user taught by Marcus can be an identity of a renter of the private property. EX1003, ¶170. It would be apparent to a POSITA that “other responsible parties” to the private property can be a renter of the property, and a renter also has “control of the property.” *Id.* Given the finite number of types of persons that are “responsible parties” and have “control of” a property, it would have been obvious for a POSITA to try with a reasonable expectation of success to limit the identity of the user to be a renter of the private property, amongst other types of persons associated with a property that can designate a restriction region for that property. *Id.* It would also have been obvious to combine Humphries and Marcus as discussed in §§IX.A-B, H. *Id.* Therefore, Humphries in view of Marcus renders obvious Claim 20. *Id.*

K. Claim 21

Humphries in view of Marcus renders obvious authenticating the user identity by receiving an electronic transmission from a third party. EX1003, ¶171. Marcus discloses that users “may be required to verify ownership or control of the property.” EX1005, [0017]. A POSITA would have found it obvious that to conduct this verification, the system can either compare the user identification with information saved within the system, *e.g.*, a set of username and password, or receive electronic transmission from a “third party” (the scope of which is unclear) that indicates that the user is authorized. EX1003, ¶171. For example, Marcus teaches that the system

“may access a property database to determine property lines.” EX1005, [0038]; EX1011, [0011]. A POSITA would have understood that the system may use a property records database, such as those maintained by local authorities (*e.g.*, county governments), to determine the property lines. EX1003, ¶171. Similarly, it would have been obvious to a POSITA that the same property record databases would also include the identity of the owner of the property, which would indicate that the owner is authorized to designate a restriction region/exclusion zone for the property. *Id.* It would also have been obvious to combine Humphries and Marcus as discussed in §§IX.A-B, H. Therefore, Humphries in view of Marcus renders obvious Claim 21. EX1003, ¶171.

L. Claim 22

Humphries discloses Claim 22 for the same reasons above regarding Ground 1, Claim 22. *See* §VIII.J; §IX.H. Therefore, Humphries in view of Marcus renders obvious Claim 22. EX1003, ¶172.

M. Claim 23

Humphries discloses Claim 23. *See* §VIII.K. Additionally, Marcus discloses that the user input devices can include a touchscreen. EX1005, [0073]; EX1011, [0016]. A POSITA would have understood, or at least found it obvious, that the location of the restriction region can be input by the user via the user tracing on the touchscreen (*e.g.*, by the user creating boundary points, lines or other shapes of the

region by touching a screen showing a map of the area in which the region to be created). EX1003, ¶173.

It would have been obvious to a POSITA to further modify the user input method in Humphries to include such user touch input as taught by Marcus. EX1003, ¶173; §§IX.A-B, H. Therefore, Humphries in view of Marcus also renders obvious Claim 23. EX1003, ¶¶173-74.

X. ASSERTED GROUNDS 3(A) AND 3(B) OF INVALIDITY: CLAIMS 4-7 ARE UNPATENTABLE AS 3(A) OBVIOUS OVER HUMPHRIES IN LIGHT OF MORGAN OR 3(B) OBVIOUS OVER HUMPHRIES AND MARCUS IN LIGHT OF MORGAN.

Grounds 1 and 2, demonstrating that Humphries and Marcus disclose or render obvious the elements of Claim 1, are incorporated herein by reference. *See* §§VIII-IX, above.

A. Rationale and Motivation to Combine

As discussed in Ground 1, Humphries teaches the use of geofenced objects to ensure route adherence and tracking a fleet of vehicles. EX1004, 3:29-45. Humphries also teaches that a tracked device may be configured to transmit an alert to a datacenter if the vehicle crosses a geofenced boundary. EX1004, 6:2-5. Similarly, Morgan teaches establishing geofences, receiving signals indicative of a location of the tracked vehicle, and sending an alert if it is determined that the vehicle has crossed the geofence. EX1006, abstract, [0025], [0069]. Morgan teaches that the geofence can be established at repeating intervals lasting for a preset duration, and

each instance of the repeating intervals can start at a predetermined time. *See e.g.*, EX1006, abstract, [0035], [0040], [0044], [0051], [0069].

Morgan's time-specific geofences would have been immediately recognized as an improvement to Humphries's similar geofence system for tracking vehicles and ensuring route adherence. *KSR*, 127 S.Ct. at 1731; EX1003, ¶177. A POSITA would have been motivated by Morgan to improve Humphries's similar system in the same way as is taught by Morgan—by adding the ability to establish the geofence at repeating intervals lasting for a preset duration and starting at a predetermined time. *Id.* This would have had the predictable result of establishing a geofence at a predetermined time for a preset duration, and it would have been well-within the skill of a POSITA to do so. *Id.*; *KSR*, 127 S.Ct. at 1739. For example, it would have been well within the skill of a POSITA to add to Humphries's mapping application 150 a requirement for the user to input a preset duration and a predetermined start time for the designated restriction region. EX1003, ¶177. Humphries's base system would have been predictably improved by ensuring that the fleet being monitored adheres to the intended routes (taught by Humphries) within the intended duration (taught by Morgan). *Id.*

Further, as discussed in §§IX.A-B, it would have been obvious to a POSITA to combine Humphries with Marcus. Just like Morgan, Marcus also teaches that an entity can restrict the operating time of the geofences. EX1005, [0014], [0042] (“the

drone can fly over the location at night but not during the day”); EX1011, Appendix A (“if an individual property owner wishes to allow flights at his property on a Saturday, that is possible”). A POSITA would thus have been also motivated to combine Morgan with the Humphries-Marcus combination to further the goal of privacy protection. EX1003, ¶178. Therefore, a POSITA would have been motivated to combine Morgan with Humphries or Humphries-Marcus. *Id.*

B. Reasonable Expectation of Success

A POSITA would have had a reasonable expectation of success, as the combination of references discussed above would have involved the mere addition of an instruction to establish the geofence at a predetermined time with a preset duration as taught by Morgan to the system of Humphries or Humphries-Marcus. EX1003, ¶179. The POSITA would have had a reasonable expectation of successfully adding the programming to tracked devices 120 to account for the user’s additional input of the time-related information as taught by Morgan. *Id.* It would have taken no more than ordinary skill to successfully incorporate the additional time-related information taught by Morgan into the geofence information of Humphries. *Id.*

C. Claim 4

Morgan discloses the one or more parameters include time-related information. EX1003, ¶¶180-82. For example, Claim 1 of Morgan recites a method

comprising receiving a set of variables related to a geofence to be established at repeating intervals lasting for a preset duration, each instance of the repeating intervals occurring at a predetermined time. EX1006, Claim 1. This is supported by Fig. 7 that shows “[t]he method of establishing a geo-fence at a predetermined time and for the duration of a preset duration.” EX1006, Fig. 7 (annotated); [0069]. A POSITA would have understood that the “repeating intervals lasting for a preset duration, each instance of the repeating intervals at a predetermined time” teaches the time-related information as recited in Claim 4. EX1003, ¶180.

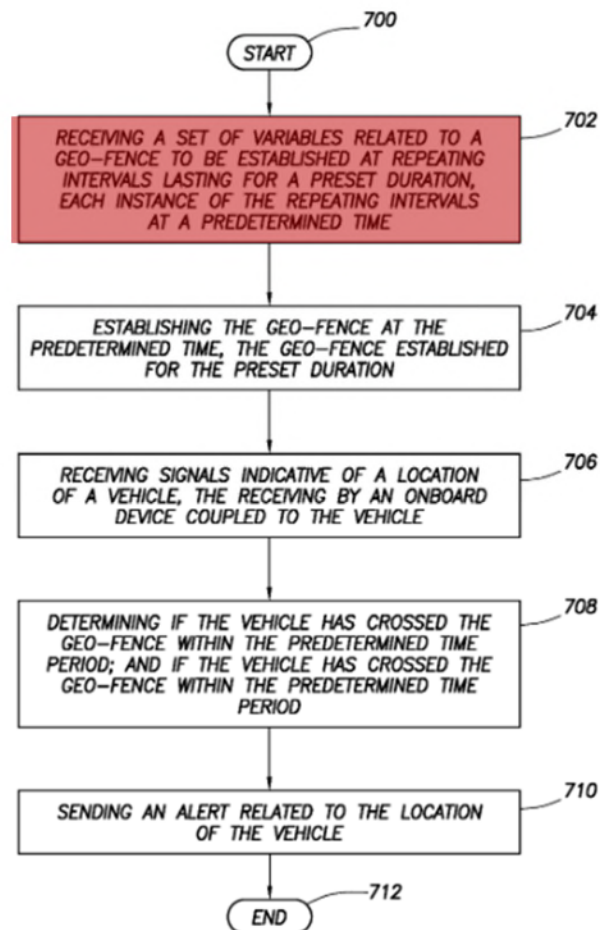


FIG.7

Morgan further discloses that a user can define a geofence around a “restricted area” with a preset duration and a specific predetermined time. EX1006, [0040] (“the parent has previously defined a geo-fence around a ‘restricted area’ of neighborhood 200 which geo-fence will automatically establish from the hours of 11:00 p.m. until 6:00 a.m. on a nightly basis”). Therefore, a POSITA would have understood that the one or more parameters input by the user include, for example, the boundaries of the geofence and the time-related information—“11:00 p.m. until 6:00 a.m. on a nightly basis”; *see also* [0044], [0051], [0069]; EX1003, ¶181.

It would have been obvious to the POSITA to modify the system of Humphries or Humphries-Marcus to include the time-related information taught by Morgan in the one or more parameters as discussed above. *See* Ground 3, §§X.A-B; EX1003, ¶182.

D. Claim 5

Humphries or Humphries-Marcus in view of Morgan discloses at least one of the alternatives in the Markush group: the time-related information is associated with a recurring or regular event having a corresponding predetermined length. *Fresenius*, 582 F.3d at 1297-98; *Cisco Systems*, IPR2021-01117, Paper No. 28, 26; EX1003, ¶¶183-84. Morgan discloses the time-related information is associated with a recurring or regular event having a corresponding predetermined length. EX1006, [0035], [0040]. For example, Morgan discloses that the geofence may establish

“every day; every week day; every weekend day; every third day, or every work day.” EX1006, [0035]. A POSITA would have understood that a geofence that is established, *e.g.*, “every work day,” is a recurring event having a corresponding predetermined length, such as from 9 am to 6 pm. EX1003, ¶183. Morgan also discloses that a parent can define a geofence that establishes “from the hours of 11:00 p.m. until 6:00 a.m. *on a nightly basis.*” EX1006, [0040]. A POSITA would thus have understood that this geofence with a predetermined length recurs every night. EX1003, ¶183.

It would have been obvious to a POSITA to modify the system of Humphries or Humphries-Marcus to associate the geofence’s time-related information with a recurring or regular event having a corresponding predetermined length taught by Morgan as discussed above. *See* Ground 3, §§X.A-B; EX1003, ¶184.

E. Claim 6

Humphries or Humphries-Marcus in view of Morgan renders obvious the time-related information indicates a duration associated with the designated restriction region. EX1003, ¶185. A POSITA would have understood that Morgan discloses time-related information indicates a duration or time period (“*e.g.*, 11:00 pm to 6:00 am”) associated with the designated restriction region (“*e.g.*, the geofences”). *See* §§X.C-D; EX1003, ¶185. It would have been obvious to a POSITA to modify the system of Humphries or Humphries-Marcus to associate the geofence

with a duration as taught by Morgan. *See* Ground 3, §§X.A-B; EX1003, ¶185.

F. Claim 7

Humphries teaches the one or more parameters include boundary information of the designated restriction region. *See* Ground 1, §VIII.A.3.

Morgan teaches that the boundaries of the designated restriction region are removed outside the duration or time period. EX1003, ¶187. For example, Morgan teaches that “a geofence is established at a specific predetermined time and *remains established for a predetermined duration.*” EX1006, [0025]. A POSITA would have understood that because Morgan teaches the geofence only remains established for a predetermined duration, it will be removed outside the duration. EX1003, ¶187. This is further supported by the various scenarios described in Morgan, where in each scenario Morgan explains that outside of the “allowed hours,” the designated restriction region will no longer be a “restricted area.” *See, e.g.*, EX1006, [0043] (geofence is not established outside of the duration); [0047] (geofence is established until the end of the curfew time period); [0060], (“After the predetermined time period has expired, the geofence is no longer established.”).

Morgan also discloses the one or more processors are further configured to associate the time-related information with the boundary information. EX1003, ¶188. Morgan’s computer system comprises a processor that couples to a main memory. EX1006, [0068]. The memory stores a program that, when executed by the

processor, causes the processor to “receive a set of variables related to a geo-fence to be established at repeating intervals lasting for a preset duration, each instance of the repeating intervals at a predetermined time; establish the geo-fence at the predetermined time, the geo-fence established for the preset duration.” EX1006, Claim 19. A POSITA would have understood that these steps disclosed by Morgan associate the time-related information with the boundary information of the geofence. EX1003, ¶188.

It would have been obvious to a POSITA to modify the system of Humphries or Humphries-Marcus to further configure the one or more processors to associate the time-related information with the boundary information such that boundaries of the designated restriction region are removed outside the duration or time period taught by Morgan as discussed above. *See* Ground 3, §§X.A-B; EX1003, ¶189.

XI. ASSERTED GROUNDS 4(A) AND 4(B) OF INVALIDITY: CLAIMS 12-15 ARE UNPATENTABLE AS 4(A) OBVIOUS OVER HUMPHRIES IN LIGHT OF CRONIN OR 4(B) OBVIOUS OVER HUMPHRIES AND MARCUS IN LIGHT OF CRONIN.

Grounds 1 and 2, demonstrating that Humphries or Humphries-Marcus disclose or render obvious the elements of Claim 1, are incorporated herein by reference. *See* §§VIII-IX, above.

A. Rationale and Motivation to Combine

Humphries’s route adherence and vehicle tracking system teaches responding to the crossing of a geofenced boundary by sending an alert to a datacenter.

§VIII.A.7. Marcus teaches that its system may download information from a “property database” to determine property lines. EX1005, [0038]; EX1011, [0011]. Cronin teaches a similar geofence system where a geo-function setting sets boundaries relating to when alerts may be presented to a user, and the system may download information from a third-party database regarding one or more geographic locations that are associated with one or more fences. EX1007, Abstract; 1:14-19; 3:20-23; 6:18-33.

A POSITA would have been motivated to modify Humphries or Humphries-Marcus to include the known technology of obtaining information of the geofence from a third-party database provided by Cronin to Humphries’s vehicle tracking system, which would have provided the same improvements to Humphries in the same way as is taught by Cronin. EX1003, ¶192; *KSR*, 127 S.Ct. at 1731. For example, a POSITA would have been motivated to access a third-party database to obtain more information associated with the designated restriction information, such as whether the user is the owner of the restriction region and thus has authority to designate the restriction region. EX1003, ¶192. This would have had the predictable result of added capabilities in Humphries or Humphries-Marcus for providing the system with additional information associated with the designated restriction region, and it would have been well-within the skill of a POSITA to do so. *Id.*; *KSR*, 127 S.Ct. at 1739.

B. Reasonable Expectation of Success

A POSITA would have had a reasonable expectation of success, as the combination of references discussed above would have involved the mere addition of the step of inquiring information from a third party taught by Cronin to the tracked devices 120 or the data center 140 of Humphries. EX1003, ¶193. A POSITA would have had a reasonable expectation of successfully adding the inquiry step. *Id.* It would have taken no more than ordinary skill to successfully incorporate the inquiring step taught by Cronin to the system of Humphries or Humphries-Marcus. *Id.*

C. Claim 12

Cronin teaches accessing information associated with the designated restriction region from one or more third-party data sources based on the location. EX1003, ¶¶194-96. For example, Cronin teaches that the smartphone, which is the system implanting the geofencing functions, “will download information from a third-party database regarding one or more geographic locations that are or will be associated with one or more fences.” EX1007, 3:20-23. A POSITA would have understood that the one or more fences in Cronin refers to the designated restriction region. EX1003, ¶194. Cronin also teaches that a variety of third parties can be the sources of the information, such as “safety.org” and “Offenderregistry.org.” EX1007, 6:18-21.

Cronin further teaches that “the present invention is implemented in a smartphone that includes . . . a processor that executes instructions from a memory. Communications received by the smartphone through the antenna will cause the processor to execute instructions when implementing functions consistent with the invention.” EX1007, 3:14-20. A POSITA would have understood that “consistent with the invention,” the processor is configured to access information associated with the designated restriction region from one or more third-party data sources based on the location, which is a function of the invention. EX1003, ¶195.

It would have been obvious to the POSITA to modify the system of Humphries or Humphries-Marcus to include the function of accessing information from one or more data sources taught by Cronin. See Ground 4, §§XI.A-B; EX1003, ¶196.

D. Claim 13

A POSITA would have understood that data sources can be either publicly or privately accessible, and this claim is thus non-limiting. EX1003, ¶197. To the extent that Patent Owner argues otherwise, Humphries or Humphries and Marcus in view of Cronin renders this claim obvious. *Id.* Cronin teaches that the third-party data source can be a public data source that is publicly accessible over the internet. *Id.* For example, Cronin teaches that when safety.org, a database “may typically allow the user to view safe places or safety hazards,” is selected by a user, “a plurality of

geo-routes and geofences relating to safety may be downloaded onto the user's mobile electronic device." EX1007, 6:22-27. A POSITA would have understood that a source with a ".org" domain is a public data source, and it is publicly accessible over the internet because information can be downloaded onto the user's mobile phones. EX1003, ¶197.

It would have been obvious to the POSITA to modify the system of Humphries or Humphries-Marcus to include the third-party data sources taught by Cronin. See Ground 4, §§XI.A-B; EX1003, ¶198.

E. Claim 14

Humphries or Humphries-Marcus in view of Cronin renders this claim obvious. EX1003, ¶¶199-200. Cronin teaches that the third-party data sources can include government data sources, public records, or sources that list public sensitive areas. *Id.* For example, Cronin teaches third-party data sources such as "safety.org" and "Offenderregistry.org." EX1007, 6:18-21. A POSITA would have understood that a source with a ".org" domain can be a government data source or a source of public records. EX1003, ¶199. Further, Cronin teaches that "Offenderregistry.org" can enable the user to download information "identifying locations where individuals with a criminal history are known to currently reside." EX1007, 6:28-31. A POSITA would have understood that information such as the residence of individuals with a criminal history comes from a government data source or a source

of public records. EX1003, ¶199. A POSITA would have also understood that the public is sensitive about their safety, and areas with safe hazards or areas where certain individuals with criminal history live can be public sensitive areas. *Id.*

It would have been obvious to the POSITA to modify the system of Humphries or Humphries-Marcus to include the third-party data sources taught by Cronin. *See* Ground 4, §§XI.A-B; EX1003, ¶200.

F. Claim 15

Humphries or Humphries-Marcus in view of Cronin renders obvious the system wherein the information includes a response measure extracted from one or more third-party data sources. EX1003, ¶¶201-03. As discussed in Ground 1, §VIII.A.7, “an alert” is one of the response measures recited by the ’121 Patent.

Cronin teaches that geofences can be defined by a user, a third party, or a remote user, etc. EX1007, 3:32-36. Cronin then teaches that geo-locations, such as “historical monuments identified by a historical society,” and associated geofences may be downloaded from third party location sources. EX1007, 4:56-5:4. And “an alert may be issued when the user’s cell phone is 1 mile” of a historical monument. EX1007, 5:4-5. A POSITA would have understood, or at least found it obvious, that the information downloaded from the third party includes the type of response measure (*i.e.*, an alert) when the user’s cell phone is close to the historical monument. EX1003, ¶202. Similarly, a POSITA would have understood, or at least

found it obvious, that the information obtained from third parties such as “safety.org” and “Offenderregistry.org” includes the type of response measure (*e.g.*, an alert) when the user is near a safety hazard. §§XI.C-E; EX1003, ¶202. A POSITA would have further understood that such a response measure is associated with the designated restriction region (the historical monument or the area with safety hazards) that is extracted from the third-party data sources. *Id.*

It would have been obvious to the POSITA to modify the system of Humphries or Humphries-Marcus to include receiving the one or more response measures associated with the designated restriction region from a third-party data source as taught by Cronin. *See* Ground 4, §§XI.A-B; EX1003, ¶203.

XII. ASSERTED GROUND 5 OF INVALIDITY: CLAIMS 24-26 AND 28-30 ARE UNPATENTABLE AS OBVIOUS OVER HUMPHRIES IN LIGHT OF BORUGIAN.

A. Rationale and Motivation to Combine

Humphries’s route adherence and vehicle tracking system is a known device ready for improvement. EX1003, ¶204. For example, Humphries discloses responding to the crossing of a geofenced boundary by sending an alert to a datacenter. *See* §VIII.A.7. Borugian teaches the known technique of taking further responsive measures in response to crossing (or potential crossing) of a geofence, which could include providing a warning to the driver and/or shutting down the vehicle. EX1008, 12:30-31; 12:61-66; 13:1-3.

A POSITA would have been motivated to modify Humphries to include known features and techniques provided by Borugian’s vehicle tracking system to Humphries’s base vehicle tracking system. EX1003, ¶205; KSR, 127 S.Ct. at 1731. For example, a POSITA would have been motivated to extend the capabilities of Humphries’s tracked devices to, in addition to transmitting an alert, provide “a response to the detected conditions that *assures* that the usage is not unauthorized or *shuts down the vehicle*.” EX1008, 1:56-60; EX1003, ¶205.

The POSITA would have immediately recognized the benefit of Borugian’s vehicle controls, including enforcing adherence of fleet vehicles to authorized routes and zones. EX1003, ¶206. The POSITA would have been motivated to include such controls as an optional capability in the system of Humphries, which is directed to the same problem as Borugian—enforcing adherence to routes. *Id.* This would have had the predictable result of providing the base system taught by Humphries with the added capability to shut down a vehicle that has crossed or is about to cross a geofence boundary, and it would have been well-within the skill of a POSITA to do so. *Id.*; KSR, 127 S.Ct. at 1739.

B. Reasonable Expectation of Success

The POSITA would have had a reasonable expectation of success, as the combination of references discussed above would have involved the mere addition of the vehicle controls taught by Borugian to the tracked devices 120 of Humphries.

EX1003, ¶207. The POSITA would have had a reasonable expectation of successfully adding the programming to tracked devices 120 to account for the driver warnings and vehicle shutdown commands taught by Borugian. *Id.* It would have taken no more than ordinary skill to successfully incorporate the additional vehicle controls and warnings taught by Borugian into the base system of Humphries. *Id.*

C. Claim 24

1. [24pre]-[24a]

Humphries discloses these claim limitations, which are identical to claim limitations [1pre]-[1a]. *See* above Ground 1, §§VIII.A.1-2; EX1003, ¶208.

2. [24b]

Humphries discloses this claim limitation, which is identical to part of claim limitation [1b] without reciting the limitation “wherein the one or more parameters of the designated restriction region include at least a location associated with a private property.” *See* above Ground 1, §VIII.A.3; EX1003, ¶209.

3. [24c]-[24d]

Humphries discloses these claim limitations, which are identical to claim limitations [1c]-[1d]. *See* above Ground 1, §§VIII.A.4-5; EX1003, ¶210.

4. [24e]-[24f]

The ’121 Patent considers “forcing the ground vehicle to stop movement” as one of the recited response measures to affect operations of the ground vehicle along a travel path. *See* EX1001, Claim 1.

Borugian discloses that the driver is alerted, and the ground vehicle can be shut down if it is determined that the vehicle is within or near the designated restriction region or deviated from the authorized route. EX1008, 4:1-3 (“When it is determined that a location of the vehicle is inside the perimeter around the restricted area, the vehicle is shut down); 12:1-29 (explaining that the driver is notified that the vehicle may shut down within five minutes when the vehicle “has entered a restricted perimeter or is approaching a restricted perimeter”). A POSITA would have understood that the response measures in Borugian are associated with the designated restriction region based on the one or more parameters such as the boundaries of the restriction region. EX1003, ¶212. A POSITA would also have understood that the ground vehicle is forced to stop movement when it is shut down. *Id.*

Borugian discloses that if the onboard computer 18 determines that the vehicle has not returned to a planned route (*i.e.*, left the restricted area) or entered a deviation code, “the system 10 begins vehicle shutdown 128.” EX1008, 12:49-65. And, in “one embodiment, vehicle shutdown begins immediately.” *Id.*, 12:65-66. A POSITA would have understood that one or more processors within the onboard computer 18 or the system 10 need to be configured to implement the response measure of shutting down the vehicle in this situation. EX1003, ¶213.

As explained with respect to Ground 1, Humphries discloses that an alert may

be sent whenever a geofence boundary is crossed. EX1004, 6:2-6. It would have been obvious to a POSITA to modify Humphries’s base vehicle tracking and route adherence system to add the capability of shutting down the vehicle as taught by Borugian to enforce adherence to the designated routes and further increase safety in any hazardous situations. EX1003, ¶214; *see* §§IX.A-B, *supra*. The combined system would have predictably resulted in a system that comprises one or more processors configured to force the ground vehicle to stop movement when the ground vehicle is within or near the designated restriction region. EX1003, ¶214.

D. Claim 25

Humphries discloses Claim 25 for the same reasons above regarding Ground 1, Claim 2. *See* §VIII.B; §XII.C. Therefore, Humphries in view of Marcus renders obvious Claim 25. EX1003, ¶215.

E. Claim 26

Humphries discloses Claim 26 for the same reasons above regarding Ground 1, Claim 3. *See* §VIII.C; §XII.C. Therefore, Humphries in view of Marcus renders obvious Claim 26. EX1003, ¶216.

F. Claim 28

1. [28pre]-[28b]

Humphries discloses these claim limitations, which are identical to the claim limitations of [18pre]-[18b] except that the latter do not recite the limitation “operating on private property.” *See* above Ground 1, §VIII.I.1; EX1003, ¶217.

2. [28c]-[28d]

Humphries discloses these claim limitations, which are identical to claim limitations [18c]-[18d]. *See* above Ground 1, §VIII.I.2; EX1003, ¶218.

3. [28e]-[28f]

Humphries in view of Borugian renders obvious these claim limitations. *See* claim limitations [18e]-[18f], [24e]-[24f]. §VIII.I.3; §XII.C.4; EX1003, ¶219.

G. Claim 29

Humphries discloses Claim 29 for the same reasons above regarding Ground 1, Claim 2. *See* §VIII.B; §XII.F. Therefore, Humphries in view of Marcus renders obvious Claim 29. EX1003, ¶220.

H. Claim 30

Humphries discloses Claim 30 for the same reasons above regarding Ground 1, Claim 3. *See* §VIII.C; §XII.F. Therefore, Humphries in view of Marcus renders obvious Claim 30. EX1003, ¶221.

XIII. ASSERTED GROUND 6 OF INVALIDITY: CLAIM 27 IS UNPATENTABLE AS OBVIOUS OVER HUMPHRIES IN LIGHT OF BORUGIAN AND MORGAN.

Ground 5, demonstrating that Humphries in light of Borugian discloses the elements of Claims 24-26, is incorporated herein by reference. *See* §XII, above.

A. Rationale and Motivation to Combine

As discussed above in Ground 5, it would have been obvious for a POSITA to modify Humphries's base system to include the additional known feature taught

by Borugian to provide an alert or shut down the vehicle when it crosses or is about to cross a geofence boundary. §XII.A; EX1003, ¶223. Morgan also teaches establishing geofences and sending an alert if it is determined that the vehicle has crossed the geofence. EX1006, abstract, [0025], [0069]. Therefore, a POSITA would have been motivated by Morgan to improve the Humphries-Borugian's similar system in the same way as is taught by Morgan—by adding to the ability to establish the geofence at repeating intervals lasting for a preset duration and starting at a predetermined time. §X.A; EX1003, ¶223. It would have also been obvious to a POSITA to combine Humphries, Borugian, and Morgan to further enhance safety and provide additional functionality with respect to the geofence control and management. *Id.*

B. Reasonable Expectation of Success

A POSITA would have also had reasonable expectation of success of such a combination because it would have involved the mere addition of an instruction to establish the geofence at a predetermined time with a preset duration as taught by Morgan to the system of Humphries-Borugian. *See* Grounds 3&5. §X.B; §XII.B; EX1003, ¶224.

C. Claim 27

As discussed above with respect to Claim 4, Humphries in view of Borugian and Morgan renders obvious Claim 27. *See* Grounds 3&5 §X.C; §XII.C; EX1003,

¶225.

XIV. CONCLUSION

Petitioner respectfully requests institution of IPR and cancelation of Claims 1-30 of the '121 Patent as unpatentable.

August 7, 2023

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

I hereby certify that this petition complies with the type-volume limitations of 37 C.F.R. § 42.24 because it contains 13,990 words (as determined by the Microsoft Word word-processing system used to prepare the petition), excluding the parts of the petition exempted by 37 C.F.R. § 42.24.

Respectfully submitted,

Date: August 7, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies on this August 7, 2023, a true and correct copy of the foregoing **Petition for *Inter Partes* Review of U.S. Patent No. 11,482,121**, Exhibits 1001-1011, and Power of Attorney were served to the following parties via electronic mail and Federal Express:

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