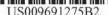
## **EXHIBIT F**



## (12) United States Patent

Dannat et al.

US 9,691,275 B2 (10) Patent No.:

Jun. 27, 2017 (45) Date of Patent:

#### (54) ADJUSTING VEHICLE TIMING IN A TRANSPORTATION NETWORK

(71) Applicant: INTERNATIONAL BUSINESS MACHINES CORPORATION,

Armonk, NY (US)

(72) Inventors: Tobias Ephraim Dannat, Zürich (CH);

Andreas Kuehmichel, Mainz (DE); Tim Scheideler, Helsinki (FI); Matthias Seul, Kassel (DE); Thomas Allen Snellgrove, Littleton, MA (US)

Assignee: International Business Machines

Corporation, Armonk, NY (US)

Subject to any disclaimer, the term of this (\*) Notice:

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/934,684

(22) Filed: Nov. 6, 2015

**Prior Publication Data** (65)

> US 2017/0132914 A1 May 11, 2017

(51) Int. Cl. G08G 1/00 (2006.01)

B60K 35/00 (2006.01)(52) U.S. Cl.

CPC ...... G08G 1/00 (2013.01); B60K 35/00

(58) Field of Classification Search

CPC ....... G08G 1/00; G08G 9/00; G08G 1/0962; G08G 1/0116; G08G 1/096716; G08G 1/04; B61L 27/0016; G06Q 10/06311; G06F 9/5011

See application file for complete search history.

#### (56)References Cited

#### U.S. PATENT DOCUMENTS

8,315,802	B2	11/2012	Brown
8,825,350	B1*	9/2014	Robinson G08G 1/0116
			340/909
2008/0094250	A1*	4/2008	Myr G08G 1/04
			340/909
2009/0077099	A1*	3/2009	Haustein G06F 9/5011
2009/0174573	Al*	7/2009	Smith G08G 1/0962
			340/905
2010/0280748	A1	11/2010	Mundinger et al.
2012/0221230	A1*	8/2012	Reilhac G08G 1/096716
			701/117
2013/0116916	A1*	5/2013	Kickbusch B61L 27/0016
			701/118
2013/0158846	A1	6/2013	Zhang
2014/0025294	A1	1/2014	Boss et al.
(Continued)			

#### FOREIGN PATENT DOCUMENTS

WO WO2007067841 A2 6/2007 WO WO2014026956 A1 2/2014

#### OTHER PUBLICATIONS

Partha Chakroborty; Optimal Routing and Scheduling in Transportation: Using Genetic Algorithm to Solve Difficult Optimization Problems; 2004.

#### (Continued)

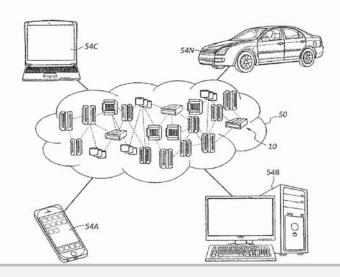
Primary Examiner — Yuri Kan

(74) Attornev, Agent, or Firm - Daniel R. Simek; George S. Blasiak; Heslin, Rothenberg, Farley & Mesiti, PC

#### (57)ABSTRACT

Methods, computer program products, and systems are presented. The methods include, for instance: obtaining passenger information of one or more passenger traveling within a transportation network; and providing one or more output based on a processing of the passenger information.

#### 18 Claims, 22 Drawing Sheets



(2013.01)



#### US 9,691,275 B2

Page 2

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

#### OTHER PUBLICATIONS

Gunjal Sunil N., Joshi Ajinkya V., Gosavi Swapnil C., Kshirsagar Vyanktesh B.; Dynamic Bus Timetable Using GPS; International Journal of Advanced Research in Computer Engineering & Technology (IJARCET); vol. 3 Issue 3, Mar. 2014.

S.R. Subramanya; Adaptive Bus Routing Heuristics for Improving Vehicle Utilization and Reducing Commuter Waiting Times; International Journal of Innovative Research in Computer and Communication Engineering; vol. 2, Issue 5, May 2014.

Mel, Peter; Grance, Timothy; The NIST Definition of Cloud Computing; NIST Special Publication 800-145; Sep. 2011.

T.E. Dannat, et al. "List of IBM Patents and/or Patent Applications Treated as Related," U.S. Appl. No. 15/582,909, filed May 1, 2017, Dated: May 1, 2017.

T.E. Dannat, et al. "Adjusting Vehicle Timing in a Transportation Network," U.S. Appl. No. 15/582,909, filed May 1, 2017.



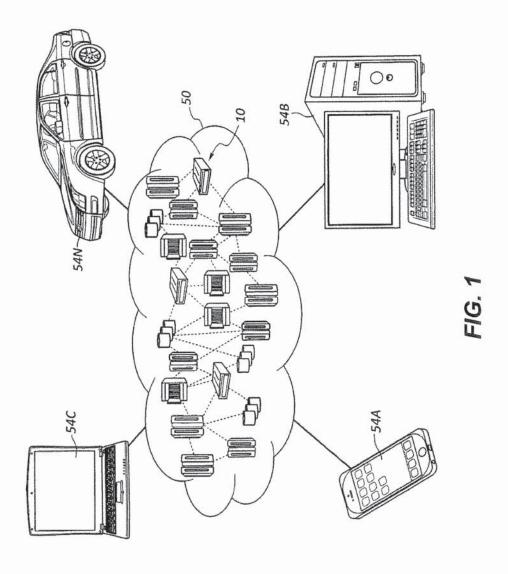
<sup>\*</sup> cited by examiner

U.S. Patent

Jun. 27, 2017

Sheet 1 of 22

US 9,691,275 B2

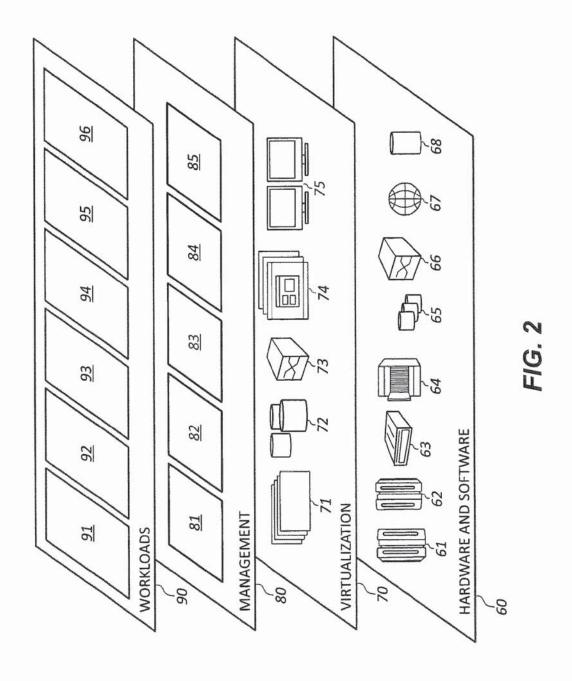


U.S. Patent

Jun. 27, 2017

Sheet 2 of 22

US 9,691,275 B2



# DOCKET

## Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## **Real-Time Litigation Alerts**



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

### **Advanced Docket Research**



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

### **Analytics At Your Fingertips**



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

#### API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

#### **LAW FIRMS**

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

#### **FINANCIAL INSTITUTIONS**

Litigation and bankruptcy checks for companies and debtors.

#### **E-DISCOVERY AND LEGAL VENDORS**

Sync your system to PACER to automate legal marketing.

