

SE 329 – Software Project Management

Intellectual Property Essentials

Lotfi ben Othmane

Prepared by

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What is a Patent?

- A bargain with the federal government – inventors receive a period of exclusivity in exchange for full disclosure
- Covers processes, machines, manufactures, compositions of matter, or any new and useful improvement thereof
- Obtained by filing a patent application and successfully arguing with the patent office that it is patentable and paying fees
- Protection can last for 20 years from the first filing date

Utility Patents

- A “regular” patent – protects structural or functional features of an invention
- Contains a specification that ends with one or more claims that define the scope of what is protected and drawings
- Goes through an examination process
- Protection can last for 20 years from the first filing date
- Software patents and business methods – the USPTO hates them!

Provisional Applications

- A “place holder” application – does not get granted as a U.S. Patent
- Anything you can file as a utility patent can be filed as a provisional application
- Can be filed quickly and inexpensively
 - \$260 for large entity
 - \$130 for small entity
 - \$65 for micro entity
- Good for last minute filing situations
- Must be converted within 1 year from filing to keep it alive

Design Patents

- Protects the ornamental design for an article of manufacture, not structural or functional features
- Protection lasts 14 years from issue

United States Patent Office

Des. 210,767
Patented Apr. 16, 1968

210,767
CUP

Leonard R. Anglada, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill., a corporation of Delaware

Filed Feb. 23, 1967, Ser. No. 5,915

Term of patent 14 years
(Cl. D9-210)

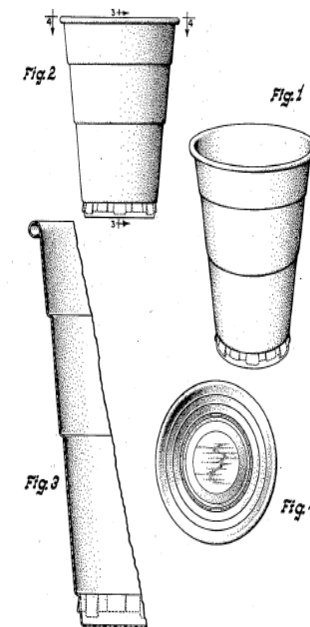


FIG. 1 is a perspective view of a cup showing my new design;

FIG. 2 is a side elevational view thereof;

FIG. 3 is an enlarged fragmentary sectional view of my new cup as viewed along lines 3-3 of FIG. 2; and FIG. 4 is a top plan view of my new cup as viewed along lines 4-4 of FIG. 2.

The essential features of the design are shown in full lines and reside primarily in the proportional relationship of approximately 1:1-1/2:2 between the three frusto-conical areas of differing axial dimensions.

I claim:

The ornamental design for a cup, as shown and described.

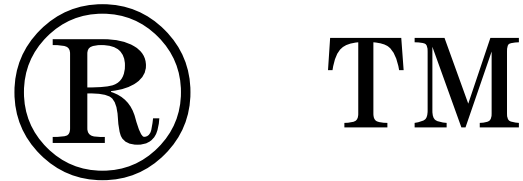
References Cited

UNITED STATES PATENTS

D. 159,599	8/1950	Chaplin	D44-9
D. 204,783	5/1966	Johnson	D44-9
3,091,360	5/1963	Edwards	

JOEL STEARMAN, Primary Examiner.

Trademark

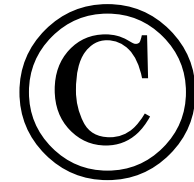


- Identifies the source of goods or services
- Obtained through registration or common law
- The mark must be used to get the protection
- Registration lasts 10 years, can be renewed for 10-year periods (different rule for older marks)

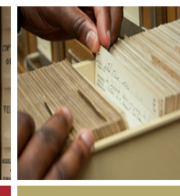
The screenshot shows the USPTO website interface. At the top, there is a navigation bar with the USPTO logo, the text "UNITED STATES PATENT AND TRADEMARK OFFICE", and links for "About Us", "Careers", and "Contact Us". A search bar is located on the right side of the navigation bar. Below the navigation bar, there are four main menu items: "Patents", "Trademarks" (which is highlighted), "IP Policy", and "Learning and Resources". A "Quick Links" dropdown menu is also visible. The main content area is titled "Getting Started with Trademarks" and includes a sub-section "Getting Started" with a description: "Before you apply for a trademark, you should familiarize yourself with the basics. Determine if you need a trademark or another form of Intellectual Property protection." To the right of this section, there are "Helpful Resources" listed as links: "Trademark Basics", "Using Private Legal Services", "Non-USPTO Solicitations", "Trademark FAQs", "Trademark Process", and "Madrid Protocol". Below the main content area, there is a section titled "Trademark Tools & Links" with four columns of links: "Search Trademark Database" (TESS), "Filing Online" (TEAS), "Check Status & View Documents" (TSDR), and "Trademark Trial and Appeal Board (TTAB)" (ESTTA and TTABVue).

Copyright

- Protects original works of authorship
- Obtained through registration or common law
- Protection lasts for life of author + 70 years (or up to 95 years from first publication or 120 years from creation for works made for hire)



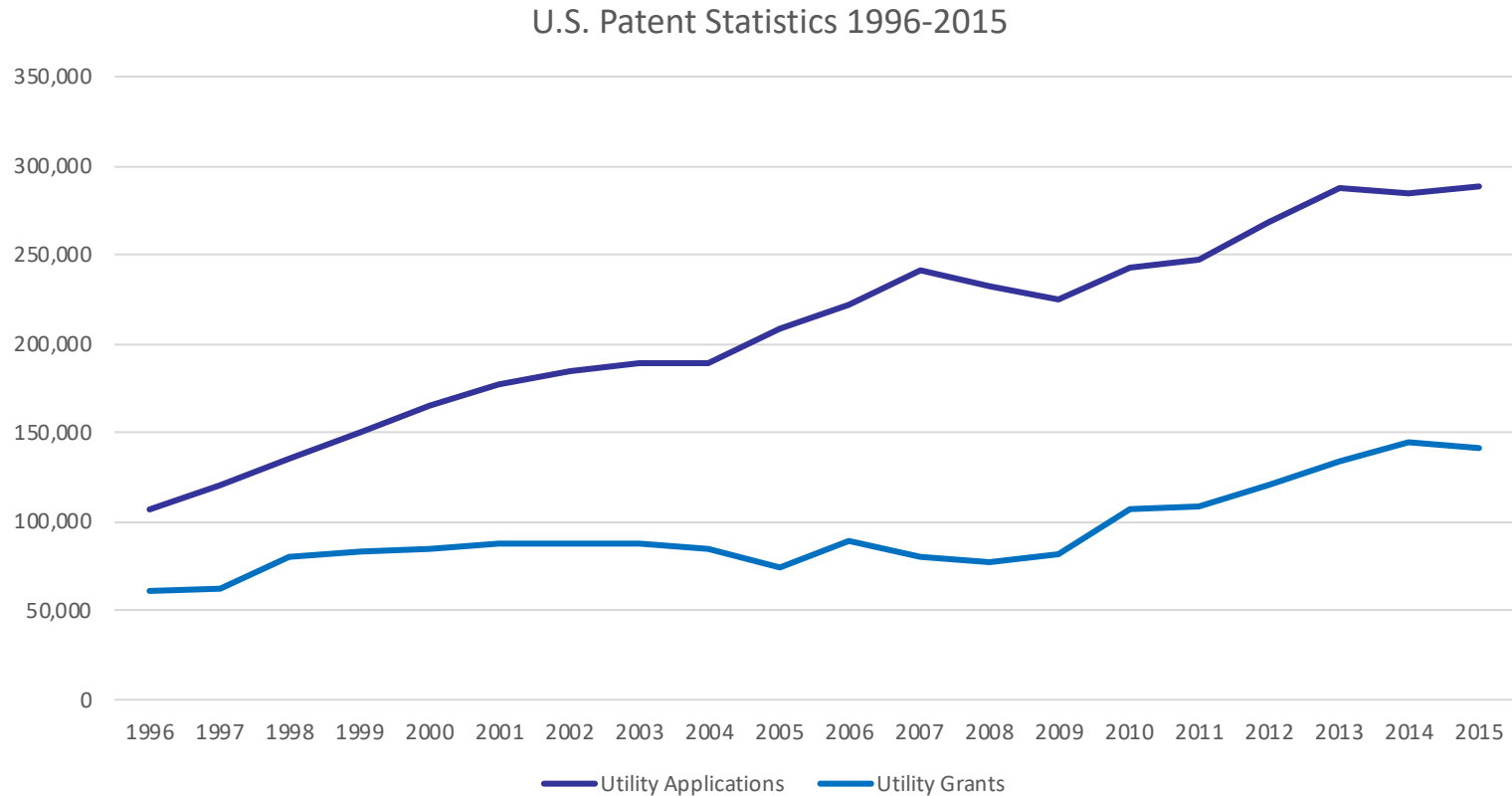
HOW DO I...?



Trade Secret

- Protects anything that derives value from being kept secret
- No registration process
- Protection lasts as long as you keep it a secret

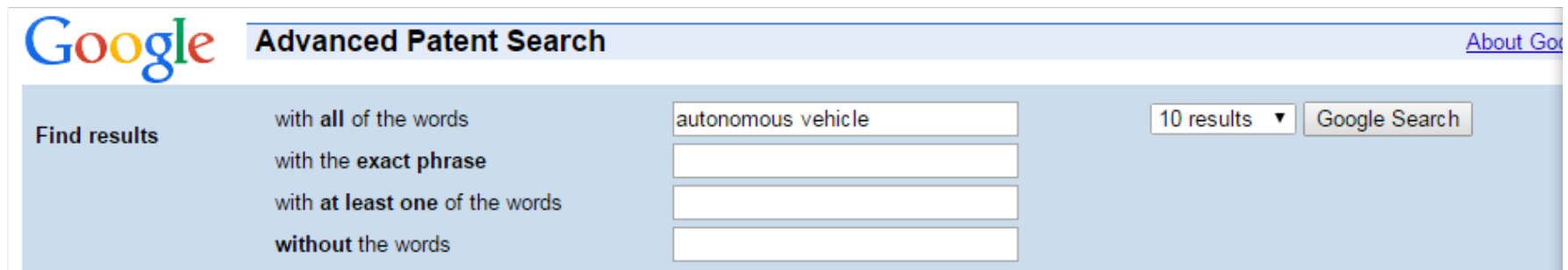
Patent Trends



Source: https://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm

Performing a Patent Search

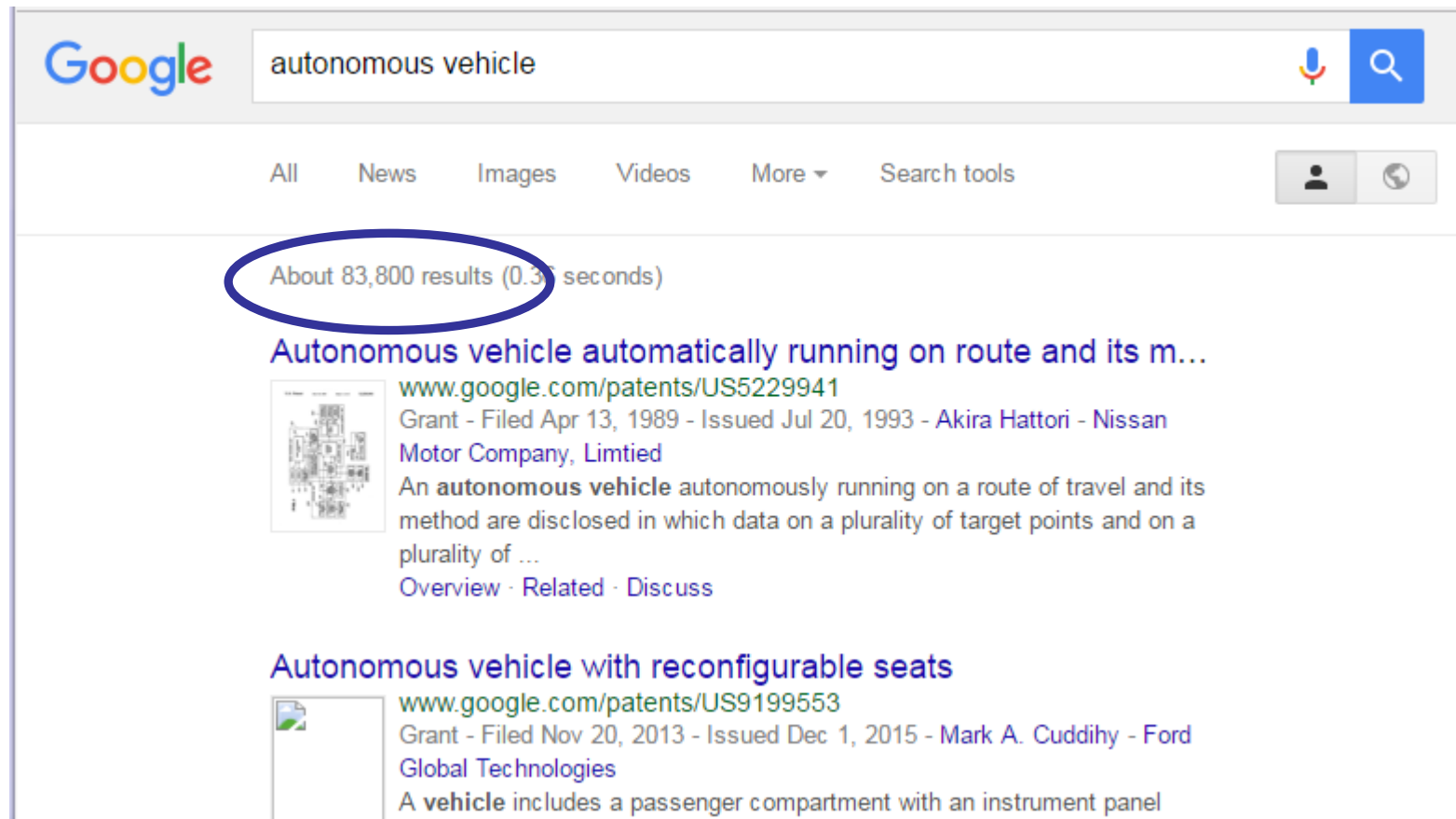
- Start small: try to find a small number (1 or 2, no more than 10) of very relevant patents using a keyword search.
- Example: I want to find patents pertaining to autonomous vehicles, so I do the following search:



The image shows a screenshot of the Google Advanced Patent Search interface. The Google logo is on the left, followed by the text "Advanced Patent Search" and a link to "About Google". Below this, there is a search form with the following elements:

- A "Find results" label on the left.
- Four search options with corresponding input fields:
 - "with **all** of the words" with an input field containing "autonomous vehicle".
 - "with the **exact phrase**" with an empty input field.
 - "with **at least one** of the words" with an empty input field.
 - "**without** the words" with an empty input field.
- A dropdown menu showing "10 results" with a downward arrow.
- A "Google Search" button.

Patent Search, cont.



The image shows a Google search interface. The search bar contains the text "autonomous vehicle". Below the search bar, there are navigation tabs for "All", "News", "Images", "Videos", "More", and "Search tools". The search results are displayed below, with the first result circled in blue. The circled text reads "About 83,800 results (0.37 seconds)". The first search result is titled "Autonomous vehicle automatically running on route and its m..." and includes a thumbnail image of a patent document. The second search result is titled "Autonomous vehicle with reconfigurable seats" and includes a thumbnail image of a patent document.

Google

autonomous vehicle

All News Images Videos More Search tools

About 83,800 results (0.37 seconds)

Autonomous vehicle automatically running on route and its m...

www.google.com/patents/US5229941
Grant - Filed Apr 13, 1989 - Issued Jul 20, 1993 - Akira Hattori - Nissan Motor Company, Lintied
An **autonomous vehicle** autonomously running on a route of travel and its method are disclosed in which data on a plurality of target points and on a plurality of ...
[Overview](#) · [Related](#) · [Discuss](#)

Autonomous vehicle with reconfigurable seats

www.google.com/patents/US9199553
Grant - Filed Nov 20, 2013 - Issued Dec 1, 2015 - Mark A. Cuddihy - Ford Global Technologies
A **vehicle** includes a passenger compartment with an instrument panel

Patent Search, cont.

The screenshot shows a Google search interface. The search bar contains the text "autonomous vehicle collision avoidance". Below the search bar, there are navigation tabs for "All", "News", "Videos", "Images", "More", and "Search tools". The search results are displayed below, with the first result circled in blue. The circled text reads "About 10,600 results (0.4 seconds)". The first search result is titled "Autonomous aerial vehicle collision avoidance system and m..." and includes a link to "www.google.com/patents/WO2015175379A1?cl=en". The second result is titled "Dynamic safety envelope for autonomous-vehicle collision av..." and includes a link to "www.google.com/patents/US6393362".

Google

autonomous vehicle collision avoidance

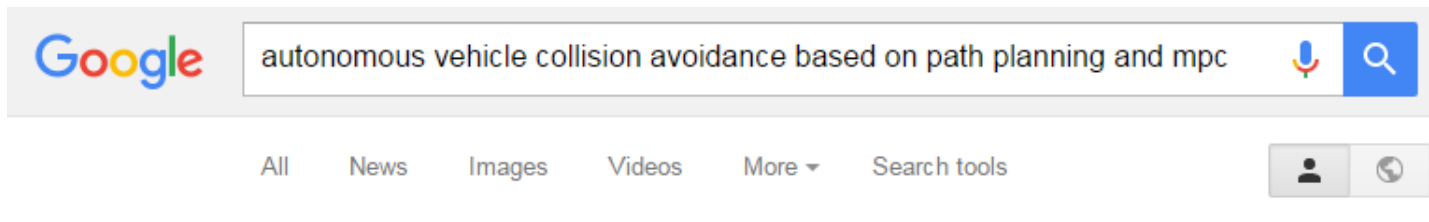
All News Videos Images More Search tools

About 10,600 results (0.4 seconds)

Autonomous aerial vehicle collision avoidance system and m...
www.google.com/patents/WO2015175379A1?cl=en
App. - Filed May 11, 2015 - Published Nov 19, 2015 - Fabrice KUNZI - Aurora Flight Sciences Corporation
An obstacle-avoidance system for a vehicle, the obstacle-avoidance system may comprise: a communication device; a plurality of sensors, the ...
Overview · Related · Discuss

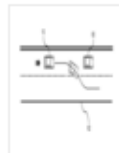
Dynamic safety envelope for autonomous-vehicle collision av...
www.google.com/patents/US6393362
Grant - Filed Mar 7, 2000 - Issued May 21, 2002 - Ray L. Burns - Modular

Patent Search, cont.



About 95 results (0.40 seconds)

Steering assist in driver initiated collision avoidance maneuver



www.google.com/patents/US8849515

Grant - Filed Jul 24, 2012 - Issued Sep 30, 2014 - Nikolai K. Moshchuk - GM Global Technology Operations LLC

recursively generating an optimum **collision avoidance** path to a target lane for ... the host **vehicle** along the optimum **collision avoidance** path is **based** on a and devices to semi-**autonomously** or **autonomously** control a **vehicle** to avoid a Inputs relating to the **path planning** is applied to the **MPC** 92 for ...

[Overview](#) · [Related](#) · [Discuss](#)

Integrated framework for vehicle operator assistance based o...



www.google.com/patents/US8744648

Grant - Filed Apr 9, 2013 - Issued Jun 3, 2014 - Sterling J. Anderson - Massachusetts Institute Of Technology

Time-**based** threat measures project time to **collision** (TTC) **based** on current speeds, stability control, and **autonomous** or semi-**autonomous** based avoidance ... or a specific path proposed by an automatic path

Patent Search, cont.

(12) **United States Patent**
Moshchuk et al.

(54) **STEERING ASSIST IN DRIVER INITIATED COLLISION AVOIDANCE MANEUVER**

(75) Inventors: **Nikolai K. Moshchuk**, Grosse Pointe, MI (US); **Shih-Ken Chen**, Troy, MI (US); **Chad T. Zagorski**, Clarkston, MI (US); **Aamrapali Chatterjee**, Okemos, MI (US)

(73) Assignee: **GM Global Technology Operations LLC**, Detroit, MI (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 77 days.

(21) Appl. No.: **13/556,471**

(22) Filed: **Jul. 24, 2012**

(65) **Prior Publication Data**

US 2014/0032049 A1 Jan. 30, 2014

(51) **Int. Cl.**
B62D 6/00 (2006.01)
B62D 5/00 (2006.01)

(52) **U.S. Cl.**
 USPC **701/42**; 701/41; 701/96; 701/302;
 340/435; 340/436

(58) **Field of Classification Search**
 CPC B62D 15/0265; G08G 1/16
 See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,765,116 A * 6/1998 Wilson-Jones et al. 701/41
 5,870,303 A * 2/1999 Trovato et al. 700/61
 8,437,890 B2 * 5/2013 Anderson et al. 701/3
 8,605,947 B2 * 12/2013 Zhang et al. 382/104
 2004/0090117 A1 * 5/2004 Dudeck et al. 303/191
 2004/0193351 A1 * 9/2004 Takahashi et al. 701/70
 2004/0193374 A1 * 9/2004 Hae et al. 701/301
 2005/0115753 A1 * 6/2005 Pemberton et al. 180/167

(10) **Patent No.:** **US 8,849,515 B2**
 (45) **Date of Patent:** **Sep. 30, 2014**

005/0216182 A1* 9/2005 Hussain et al. 701/200
 007/0080825 A1* 4/2007 Shiller 340/903
 007/0288133 A1* 12/2007 Nishira et al. 701/23
 008/0046145 A1* 2/2008 Weaver et al. 701/41
 008/0172156 A1* 7/2008 Joh et al. 701/45
 008/0208408 A1* 8/2008 Arbitmann et al. 701/41
 008/0319610 A1* 12/2008 Oechsle et al. 701/41
 009/0099728 A1* 4/2009 Ichinose et al. 701/39
 009/0125225 A1* 5/2009 Hussain et al. 701/200
 009/0322500 A1* 12/2009 Chatterjee et al. 340/435
 010/0030426 A1* 2/2010 Okita 701/41
 010/0274435 A1* 10/2010 Kondoh et al. 701/29
 011/0029235 A1* 2/2011 Berry 701/207
 011/0178710 A1* 7/2011 Pilutti et al. 701/301
 012/0083947 A1* 4/2012 Anderson et al. 701/3
 012/0101713 A1* 4/2012 Moshchuk et al. 701/301
 012/0139715 A1* 6/2012 Yamazato 340/436
 012/0239252 A1* 9/2012 Sawada et al. 701/41
 013/0030651 A1* 1/2013 Moshchuk et al. 701/41
 013/0124041 A1* 5/2013 Belser et al. 701/41
 013/0166150 A1* 6/2013 Han et al. 701/42

* cited by examiner

Primary Examiner — Calvin Cheung

Assistant Examiner — Krishnan Ramesh

(57) **ABSTRACT**

A collision avoidance system for assisting a driver in avoiding a collision between a host vehicle and obstacle. A processor recursively calculates a time-to-collision with the obstacle and an optimal collision avoidance path for avoiding the collision. The optimum collision avoidance path is recursively generated based on a position and speed of the host vehicle relative to the obstacle and an updated calculated time-to-collision. A sensing device determines whether the driver of the vehicle has initiated a steering maneuver to avoid the obstacle. A steering assist mechanism maintains the host vehicle along the optimum collision avoidance path. The steering assist mechanism applies a steering assist torque for producing steering adjustments to assist in guiding the host vehicle along the optimum collision avoidance path to the target lane. The steering assist torque generated by the steering assist mechanism is recursively adjusted based on a recent updated optimum collision avoidance path.

18 Claims, 5 Drawing Sheets

Patent Search, cont.

PATENT CITATIONS

Cited Patent	Filing date	Publication date	Applicant	Title
US5765116 *	Sep 19, 1996	Jun 9, 1998	Lucas Industries Public Limited Company	Driver assistance system for a vehicle
US5870303 *	Oct 14, 1994	Feb 9, 1999	Philips Electronics North America Corporation	Method and apparatus for controlling maneuvers of a vehicle
US8437890 *	Jul 15, 2010	May 7, 2013	Massachusetts Institute Of Technology	Integrated framework for vehicle operator assistance based on a trajectory prediction and threat assessment
US8605947 *	Oct 19, 2009	Dec 10, 2013	GM Global Technology Operations LLC	Method for detecting a clear path of travel for a vehicle enhanced by object detection
US20040090117 *	Jul 12, 2001	May 13, 2004	Ingo Dudeck	Automatic brake and steering system and method for a vehicle
US20040193351 *	Feb 23, 2004	Sep 30, 2004	Nissan Motor Co., Ltd.	Automatic brake system for a vehicle
US20040193374 *	Mar 28, 2003	Sep 30, 2004	Hac Aleksander B.	Collision avoidance with active steering and braking
US20050115753 *	Jan 9, 2003	Jun 2, 2005	Safeguard Technology Limited	Automated vehicle steering and braking
US20050216182 *	Jun 24, 2004	Sep 29, 2005	Hussain Talib S	Vehicle routing and path planning
US20070080825 *	Sep 5, 2004	Apr 12, 2007	Zvi Shiller	Method and system for providing warnings concerning an imminent vehicular collision
US20070288133 *	Jun 11, 2007	Dec 13, 2007	Nissan Motor Co., Ltd.	Obstacle avoidance path computing apparatus, obstacle avoidance path computing method, and obstacle avoidance control system equipped with obstacle avoidance path computing system
US20080046145 *	Aug 17, 2006	Feb 21, 2008	Weaver Richard A	Collision prediction and mitigation method for a vehicle
US20080172156 *	Jan 16, 2007	Jul 17, 2008	Ford Global Technologies, Inc.	Method and system for impact time and velocity prediction
US20080208408 *	Mar 13, 2008	Aug 28, 2008	Continental Teves Ag & Co. Ohg	Method and device for performing a collision avoidance maneuver

Patent Search, cont.

REFERENCED BY

Citing Patent	Filing date	Publication date	Applicant	Title
US9182761 *	Aug 23, 2012	Nov 10, 2015	Nissan Motor Co., Ltd.	Autonomous driving control system for vehicle
US9212926 *	Nov 22, 2013	Dec 15, 2015	Ford Global Technologies, Llc	In-vehicle path verification
US9230443 *	Mar 19, 2013	Jan 5, 2016	Ford Global Technologies, Llc	Method and system for predictive vehicle systems performance selection for enhanced maneuverability
US20140222278 *	Aug 23, 2012	Aug 7, 2014	Nissan Motor Co., Ltd.	Autonomous driving control system for vehicle
US20140288775 *	Mar 19, 2013	Sep 25, 2014	Ford Global Technologies, Llc	Method and system for predictive vehicle systems performance selection for enhanced maneuverability
US20150149088 *	Nov 22, 2013	May 28, 2015	Ford Global Technologies, Llc	In-vehicle path verification

* Cited by examiner

Patent Search, cont.

- Go through the forward/backward references for the relevant documents you find.
- Once you are satisfied with your list, take a look at the classifications. Which ones keep showing up?

Where do I find the Patent Class?

CLASSIFICATIONS

U.S. Classification	701/42, 701/41, 340/435, 701/96, 340/436, 701/302
International Classification	B62D6/00, B62D5/00
Cooperative Classification	G08G1/167, G08G1/165, B62D15/0265, G08G1/166

(21) Appl. No.: **13/556,471**

(22) Filed: **Jul. 24, 2012**

(65) **Prior Publication Data**

US 2014/0032040 A1 Jan. 30, 2014

(51) **Int. Cl.**
B62D 6/00 (2006.01)
B62D 5/00 (2006.01)

(52) **U.S. Cl.**
USPC **701/42; 701/41; 701/96; 701/302;**
340/435; 340/436


(58) **Field of Classification Search**
CPC B62D 15/0265; G08G 1/16
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,765,116	A *	6/1998	Wilson-Jones et al.	701/41
5,870,303	A *	2/1999	Trovato et al.	700/61
8,437,890	B2 *	5/2013	Anderson et al.	701/3
8,605,947	B2 *	12/2013	Zhang et al.	382/104
2004/0090117	A1 *	5/2004	Dudeck et al.	303/191
2004/0193351	A1 *	9/2004	Takahashi et al.	701/70
2004/0193374	A1 *	9/2004	Hac et al.	701/301
2005/0115753	A1 *	6/2005	Pemberton et al.	180/167

Patent Searching by Class

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Find results with **all of the words** 10 results

with the **exact phrase**

with **at least one** of the words

without the words

Patent number Return patents with the patent number

Title Return patents with the patent title

Inventor Return patents with the inventor name
First name, last name, or both

Original Assignee Return patents with the original assignee name
First name, last name, or both

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Comma separated list of one or more classification codes.

International Classification Return patents with the international classification
Comma separated list of one or more classification codes.

Cooperative Classification Return patents with the cooperative classification
Comma separated list of one or more classification codes.

Patent type/status Return patents with type/status

Date Return patents anytime
 Return patents between and
e.g. 1999 and 2000, or Jan 1999 and Dec 2000

Restrict date by Restrict by filing date Restrict by issue date

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Class 701 DATA PROCESSING: VEHICLES, NAVIGATION, AND RELATIVE LOCATION

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Turn Outline

Select Largest Indent Level to be Displayed

- [A](#) [P](#) [1](#) **VEHICLE CONTROL, GUIDANCE, OPERATION, OR INDICATION**
- [A](#) [P](#) [2](#) · [Remote control system](#)
- [A](#) [P](#) [3](#) · [Aeronautical vehicle](#)
- [A](#) [P](#) [4](#) .. [Altitude or attitude control or indication](#)
- [A](#) [P](#) [5](#) ... [Rate of change \(e.g., ascent, decent\)](#)
- [A](#) [P](#) [6](#) [Angle of attack](#)
- [A](#) [P](#) [7](#) ... [Air speed or velocity measurement](#)
- [A](#) [P](#) [8](#) ... [Threshold or reference value](#)
- [A](#) [P](#) [9](#) [Warning signal or alarm](#)
- [A](#) [P](#) [10](#) ... [Compensation for environmental conditions](#)
- [A](#) [P](#) [11](#) Auto pilot

42 [Feedback, transfer function or proportional and derivative \(P&D\) control:](#)

This subclass is indented under [subclass 41](#). Steering control wherein the electrical [data processing](#) system or calculating computer utilizes a response signal corresponding to the status of the steering system, to regulate or monitor the steering operation or where the system shifts from proportional control to a combination of proportional and derivative control.

How do I Know When I Am Done Searching?

- If you search the entire relevant class, you can feel pretty good about the thoroughness of your search.
- Circularity is another sign that you are “done.”
- There is no guarantee that you have found everything.
- You are under no obligation to do a search.
 - Doing a search can give you valuable information about how crowded your field is, how likely you are to need a license, or whether your invention is patentable.
 - Doing a search can potentially lead to issues later on.

Reading a Patent – CLAIMS

1. A steering wheel angle detecting system for detecting changes in steering wheel position during times when an ignition switch is powered off, the system comprising:

a steering wheel angle sensor;

an electric generator coupled to and providing power to the steering wheel angle sensor upon occurrence of steering wheel movement during times when the ignition switch is powered off;

a controller; and

memory for storing changes in the steering wheel angle sensor.

2. The system as claimed in claim 1 whereby the electric generator further comprises an electric motor.

3. The system as claimed in claim 2 whereby the electric motor is in a electric power steering system.

What to Take to a Meeting With a Patent Attorney/Agent

- They want to know:
 - What is the problem to be solved?
 - How have others solved the problem?
 - How do you solve the problem, and how is it different from what others have done?
 - Unexpected results?
 - Have you told anyone about your idea, tried to sell it, or otherwise disclosed information about it to others? When did that happen?
- Things that are helpful:
 - Lab notebooks
 - Drawings, videos, models, prototypes, etc.
 - Any write-up you may have that answers the above questions.

Non-disclosure/Confidentiality Agreements

- Defines confidential information, and indicates what can be done with it
- Recommended before talking to third parties about non-public information
- If you plan to disclose something that you may want to patent, consider filing a patent application before talking to the third party (can be a provisional)

Indemnification

- Be wary of indemnification clauses in agreements.
- Be especially wary of indemnification clauses that involve intellectual property infringement.
- Big companies will likely insist on keeping their indemnification language, but you may be able to get them to agree to *knowing* infringement.

Employment Agreements

- Some employers ask new employees to agree to assign everything they invent during employment to the employer.
- Assignment is a transfer of ownership. A document is signed and recorded with the USPTO.
- Be aware of what you are signing. Will it encompass things you invent at home on your own time?
- Don't use employer facilities, equipment, etc. to pursue your independent efforts. This helps your case if the employer tries to claim an obligation to assign your independent IP to them.

Open Source Software

- Read license agreements carefully!
- Copyleft: By combining certain open source software with proprietary software, the proprietary software might have to be made public under an open source license similar to the one used for the open source software. (GPL is an example)

For more information

- USPTO – U.S. Patent and Trademark Office: www.uspto.gov
- U.S. Copyright office: www.copyright.gov
- Google advanced patent search:
https://www.google.com/advanced_patent_search
- USPTO patent class schedule:
<https://www.uspto.gov/web/patents/classification/selectnumwithtitle.htm>

Any Question?