

~~GLOBAL REGISTRY OF FIRE HYDRANTS AND CLOSED SYSTEM FIRE-
HYDRANT WATER FLOW TEST
SYSTEMS AND METHODS FOR A WEB BASED INSPECTION COMPLIANCE
REGISTRY AND COMMUNICATION TOOL~~

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~~FIELD OF THE INVENTION~~

~~The general field of the Global Registry of Fire Hydrants is record keeping.
Specifically, it is the record keeping of hydrant inspection, testing, and maintenance. Other
fields classifiable by this invention are fire safety, water quality, financial asset evaluation,~~

infrastructure evaluation, and land survey equipment. The specific groups impacted by this

tool will primarily be fire departments and hydrant maintenance crews. The registry will also provide essential tools and information (previously unavailable) to insurance companies and rating bureaus, engineers, planning and development agencies, developers, surveyors, hydrant manufacturers, government agency chief financial officers, businesses, private hydrant owners, and the general public. Additionally, a new and unique computer input device advantageously provides efficient data input into the registry. The computer input device incorporates a central processing unit (CPU), a phone with data transferring capabilities, a GPS unit, and a camera. Data is both manually and automatically inserted into the computer. Coordinates from the GPS unit can be manually or automatically downloaded into the computer. Pictures from the camera are automatically downloaded to the computer. The computer utilizes a customized data entry program to organize data collection. The communication connection between the computer, the GPS unit, and the camera may be hardwired or wireless (such as Bluetooth). The data entry program then utilizes the phone to upload (and download) data to the Global Registry of Fire Hydrants. The phone utilizes a data transferable phone network (such as Verizon's CDMA network or Sprint's EVDO network.)

The Global Registry of Fire Hydrants is a new **product** of collected information into a single database specifically for fire hydrants. The database can be bought, sold, and used for other products. For example, an infrastructure testing program could buy/lease the database to test the reliability of a water system.

The Global Registry of Fire Hydrants is also a new **method** for maintaining records and scheduling inspections, tests, maintenance, and audits of fire hydrants. It also provides new **methods** for communication between fire marshals and maintenance crews, communication between fire departments and the general public or non-profit organizations such as "Adopt A Hydrant". It is a tool to evaluate hydrant trends, to grade hydrant

manufacturer's products, to assist the planning of new hydrant locations and community development, to assist in land surveying, and to provide record keeping and reporting of water quality.

The Global Registry of Fire Hydrants is the **composition** of a new standard for collecting fire hydrant information. The registry defines a newer and more complete set of data entries field to help describe all aspects of a fire hydrant. By defining a complete and global standard for fire hydrants more third-party groups will find the database useful and will be able to make 'apple to apple' comparisons. Specific information collected includes, but is not limited to; hydrant ownership, make, model, year, color, condition, rating of needed maintenance (critical, important, light, or none), specific recommended maintenance, pressure, flow, GPS location, address, time of inspection, environment conditions during inspection, landscaping, digital picture of hydrant, nozzle size and orientation, physical description of hydrant, special markings, service record, water quality, and hydrant number. The registry will be used via a website. The website allows users to view specific hydrant information and it provides support for filtering, evaluating, and reporting selected data.

- a. An inspection crew will use the registry to record all findings regarding a fire hydrant test and inspection. The registry will provide a consistent standard and a single database for data collection. Standardized testing and inspections will provide coherence among all public and private hydrant information and allow for better research and decision making. The hydrant inspection crew may be a fire department, a water department, a city maintenance crew, an owner, a hydrant maintenance company, or the general public.
- b. The fire department will use the registry when preparing for a fire by researching the hydrant condition, the GPS location, the GIS map, and the digital picture for a visual confirmation prior to arriving at the site. This preparation will allow fire fighters to attack a fire quicker and safer. A fire truck may be equipped with access to the online database or a copy of the local data so that a personal digital assistant (PDA), a handheld PC, a smartphone, a tablet PC, or any computer device will be able to view the hydrants in the vicinity of the emergency. The registry will also assist the fire department with directions and provide a GIS map for driving directly to the hydrants nearest to the fire. Additional software will use the registry to help the fire fighters determine which hydrants will provide the best rated flow capacity for a given address. Pre-determination of a hydrant's location and condition will greatly improve the time to extinguish a fire and save money and lives.

- e. ~~Fire hydrant maintenance crews will use this registry to schedule and prepare necessary maintenance at specific fire hydrants. The registry will be set up to automatically notify (by email for example) the maintenance crew when a fire hydrant is found to be defective or needing maintenance. In preparing for their work, they will be able to filter the registry's database into a set of hydrants for their area. They can further filter the data to show only hydrants needing critical, important, light, or no maintenance. This final filtered set will show the maintenance crew what hydrants need maintenance, by what priority, what specific maintenance needs to be done, what materials will be needed, GPS coordinates for each hydrant, and a GIS map showing where the hydrant is visually, among other things. They will then be able to update the registry to reflect the repairs. Another use of the registry will use the water flow information of each hydrant in an area to determine where a water main or a water source may be leaking or need improvements.~~
- d. ~~The local fire marshals will use the registry to verify progress of the maintenance crews. The registry can automatically notify the local fire marshal when a fire hydrant is found to be defective or needing maintenance. And again notified when repaired. That information is critical to the local fire marshal when preparing a fire department for an attack on a fire. The registry will help determine which hydrants to avoid and which hydrants should be considered the primary source for fighting the fire. Additionally the local fire marshal will be able to determine which hydrants are publicly or privately owned. For example, he can determine the specific owner of a private fire hydrant and the hydrant's service record. If there is a comment or concern with a private hydrant then the fire marshal can automatically email his concerns to the private hydrant owner.~~
- e. ~~Private hydrant owners will register their hydrants in the global registry which will notify the owner when inspection and testing is required. They will also be notified when repairs or maintenance is needed. Additionally, the owner can use the registry to find registered service and repair companies. The registry will also assist the owner in preparing bid requests from the registered service and repair companies. The owner will use the registry to show NFPA compliance as well as the service record to the fire marshal.~~
- f. ~~State fire marshals will use the registry to review the status of fire hydrants in a specified area (statewide, citywide, or other). The registry will create a report for the state fire marshal to determine, for example, which areas are most and least compliant with NFPA and which areas have the highest and lowest percentage of required repairs. It will also assist him in creating policies and estimating budgets. For example, the state fire marshal may want a new policy requiring Stortz (quick) connections at every hydrant. Reviewing the database reveals exactly how many and where Stortz connections already exist. He can quickly and accurately predict the cost of his new policy. He can then implement his new policy by listing all the hydrants in his jurisdiction as needing 'critical' maintenance for adding a quick connection. The registry will also assist him in emailing all registered users of the new policy. If he chooses, the registry will notify him of any changes in specified areas. This will initiate communication between the state and local fire marshals regarding hydrant maintenance. Additionally the fire marshal will be able to determine areas statewide that have little or no hydrants.~~
- g. ~~Insurance companies and rating bureaus will use the registry to assist them in accurately grading a state, city, district, business, neighborhood, or house based on the conditions and location of hydrants. This allows the insurance companies to give a less~~

broad and therefore less expensive policy. Currently areas receive an ISO rating based on their fire protection 'readiness' and 'capabilities'. Some of the requirements of the ISO rating 'test' are the number of hydrants, the number of hydrants with quick connections, a test of hydrants to verify the condition, and quality of record keeping for hydrant maintenance. All of these things can now be accessed through the registry which will save the ISO representative time and money as well as improve the ISO score and rating. This will save the home and business owners millions of dollars from reduced fire insurance premiums.

- h. City engineers and planning and development agencies will have multiple uses for the registry. They will use it to update true hydrant location on city water maps (GIS, paper, and other), to decide best places to add new hydrants, to register new hydrants, to review water flow availability at a specific site, to predict problems in a water main or source, to determine ownership of private hydrants, and to plan the development of buildings, parks, neighborhoods, and city main improvements.
- i. Budgeting committees will use the registry to more accurately predict annual maintenance and repair costs. The registry will be able to report the number of hydrants and what type of maintenance is required for each one. Additionally, the registry can graph the history of an area's hydrants.
- j. The Environmental Protection Agency (EPA) and the general public will use the registry to verify a state's or city's compliance with the Safe Water Drinking Act and general information about the water quality. They will use the registry to view charts of the history of water quality improvement or degradation in a selected area over a selected time. By noting the quality of water in a GIS map, you could determine where contamination is occurring. For example, the map may show that the hydrants along 23rd Street and 2 hydrants along 24th Street are contaminated. The level of contamination is higher on 24th Street and progressively less on 23rd Street. With further investigation one could determine that the water main on 24th Street (between the 2 hydrants) may be broken and allowing contaminants into the water stream.
- k. Hydrant manufacturers would use the registry to determine the performance of their products and at the same time, relate it to competitor's products. They would also use the registry to view trends in hydrants. (For example, where wet type hydrants are more common, or if 4" quick connections (like Stortz) are becoming popular.) By using the registry as a guide they can be held accountable for their products. If a common problem exists with a specific make and model then the manufacturer could issue a recall and predict exactly where and how many units would need to be replaced. Manufacturers who use the registry to evaluate trends in hydrants could plan their manufacturing and sales better.
- l. Consumers will use the registry to determine more reliable products based on a specific make and models past performance. The registry will create reports for consumers indicating which make and models require the least amount of maintenance. They will also show which hydrants are most common in a specified area. The registry will also have links to manufacturers and lists of registered suppliers, installers, and maintenance companies.
- m. Installation, testing, inspection, service, repair, and material supply companies will register with the global registry which will allow them to receive orders or bid requests for their service or material. The registry will provide data for the website to handle the correspondence between the parties and preparation of a service or installation contract

and/or material order.

- n. Civil Engineers and Surveyors would use the fire hydrant GIS maps and GPS locations in the registry as survey points during planning and development. The fire hydrants are a fixed survey marker. The GPS location at the top of the hydrant will provide an accurate latitude, longitude, and elevation for land development or boundary determinations.
- o. Financial officers will use the registry to determine current infrastructure assets for accrual accounting practices in accordance with GASB-34. The registry will provide a total number of hydrants in a given area and an 'estimated life' left for each specific hydrant. This information will allow the financial officer to accurately report the true current value of infrastructure assets which will allow them to use more common accounting practices and improve their bond rating.
- p. The general public will use the registry to verify the quality of public fire hydrants. They can confirm that their tax dollars are being spent on fixing hydrants. They can also confirm that the specific hydrants near their homes and businesses are working in case of a fire. If they are not, they can make specific requests through the registry to have them fixed. Additionally, they will be able to determine water quality and precise GPS locations. In cities that promote fire hydrant adoption or volunteer painting, the registry will show NFPA suggested colors for painting (based on available water flow) and suggestions for upkeep of the fire hydrant (such as cutting back bushes, surface cleaning, or general landscaping. This will be an easy way to increase public awareness of fire hydrant health and reduce the city's burden of fire hydrant maintenance.
- q. In general, the model of the registry is applicable to any field. The principles of this invention involve defining a standard for data entry, recording the data in an online database, allowing data to be entered and viewed by any user, allowing a user to filter specific information in the database, allowing a user to set preferences regarding communication, and creating a program that can automatically communicate specific changes to the database. This model has many applications in fields of inventory, inspection and testing, and record keeping.

The basic purpose of the registry is to create a standard for inputting from many sources and output the information many ways to serve each different user. The registry accepts input from any source but typically data will come from an inspection or maintenance crew from a fire department, water department, or a private contractor. Ultimately, the registry will define the standard so that all the various sources will be able to communicate and share their data. Viewing the data globally will allow for more intelligent planning in various fields.

The global registry is intended to assist the government, private owners, insurance

bureaus, businesses, and the general public in providing information regarding hydrant condition, location, and water quality. The most important purpose is to prepare the fire department for the hydrant and water conditions prior to arriving at a fire incident. This preparation will improve the attack on a fire by showing the best hydrant for the fire department to connect to and also give visual reference of that hydrant prior to arriving at the site. This improvement will allow a fire department to put more water on a fire quicker and save lives and property. Non-working or low performing hydrants will be identified prior to arriving at the site and avoided.

Another major purpose of the registry is to assist maintenance crews in locating and preparing work on hydrants in need of service. Equally important, these needed and/or finished repairs are communicated back to the fire marshal and fire department. This vital communication will inform the fire fighters of hydrant conditions.

The state fire marshals are now able to review the performance of local fire marshals and maintenance crews. They can also make educated statewide decisions regarding fire hydrants. If a specific make and model of fire hydrant is problematic, the state fire marshal can recommend a recall to the manufacturer. Likewise the manufacturer can do a review of the performance of their hydrants and determine the need for a recall. This awareness of fire hydrant quality will encourage manufacturers to build better hydrants.

The improved method of record keeping hydrant information will improve a city's ISO (insurance) rating which will save money in fire insurance premiums for local businesses and homes. Insurance companies will be able to more accurately rate specific homes, neighborhoods, and cities based on their individual proximity to working hydrants.

A government agency can show their compliance with the Safe Water Drinking Act with the water quality data in the registry. The registry will help define an area that is not

~~compliant and assist in pinpointing the contamination.~~

~~All of these benefits will save lives and billions of dollars over time.~~

~~Other~~**PRIORITY
CLAIM**

This application claims priority to and incorporates all of the following by reference in their entirety U.S. Patent Provisional Application Nos. 60/886269 filed on January 23, 2007, 60/977870 filed on October 5, 2007, 60/981091 filed October 18, 2007, and 60/981784 filed on October 22, 2007.

This application incorporates all of the following by reference in their entirety U.S. Patent Provisional Application Nos. 60/969905 filed on September 4, 2007, and 60/981782 filed on October 22, 2007.

BACKGROUND OF THE INVENTION

[0001] There are many assets that are owned around the world that require compliance with a code, local rule, state law, or federal law. Compliance in most of these cases requires a periodic inspection of the owned asset. An example of owned assets requiring annual or regular inspection are fire sprinkler systems, fire alarm systems, kitchenhood systems, fire extinguishers, emergency lighting systems, backflow preventers, bridges, fire hydrants, catch basins, retention ponds, electrical systems, heating/venting/air conditioning systems, plumbing systems, aircraft, vehicles, school transportation vehicles, cranes, powerplants, dams, stormwater runoff, animals, industrial sites, environmental interests, housing, real estate, boilers, farm equipment, viaducts, tunnels, businesses, financials, pharmaceutical caches, weapon caches, amusement parks/rides, elevators, escalators, pilings, piers, safety equipment, kitchens, and others. For purposes of a non limiting example a fire hydrant will be used as an owned asset throughout the specification, however it should be readily appreciated that any owned asset may be substituted for the fire hydrant.

[0002] In order to ensure that a fire hydrant is working and is capable to dispense water the hydrant is preferably inspected annually. The hydrant is usually inspected by a range

of individuals including but not limited to a citizen, an owner, a water purveyor, a firefighter, and/or a fire marshal. An inspector will record information about the hydrants location and operability. The completed inspection may be recorded in local neighborhood records (privately owned hydrant), a firehouse or in a computer system stored locally in an inspectors office. Most of these inspections are not available globally and generally are not available at the time of a fire. If a hydrant is not inspected a fire crew could waste valuable time trying to find water for their hoses from a malfunctioning hydrant. A hydrant also could be leaking water or be otherwise unsafe, which may not be discovered without an inspection. In most areas very few hydrants are inspected because of the large number of hydrants, the lack of a working inspection enforcement and tracking system and because there is not currently a way to use the inspection information at the time of a fire near the hydrant.

[0003] Computer software has been used in the past as a way for inspecting authorities to track fire hydrant usage. These previous software approaches focus on collecting limited data of the on each fire hydrant and keepkeeping the information local to the fire department or owner only. OneA typical fire hydrant management software-program is FIREHOUSE. This program allows the user to input hydrant information, schedule maintenance, and create reminders for service. The local fire department can evaluate their-inputted data to determine water flow information and general location. The program (and all others)-doesThese programs do not record data such as water quality, GPS location, or condition. Also they do not record suggestionsrequests for maintenance or improvements. There are many software programs and None of themprevious approaches communicate with each other- or communicate with a global registry. In fact, none of them communicate with other users who use the same program. The registry offers them a common standard and therefore there is not a system that currently combines all of the gathered data for the collected information and a place to share them. With some software changes to these programs they could work well with the global registryuse by sharing this local information for the benefits of all interested parties.

fire departments. Commonly, because of high software costs and the lack of organization, departments do not use a formal hydrant management software program and instead rely on pencil,

paper, calendars, and file cabinets.

~~calendars, and file cabinets. One of the most common deductions in an ISO score is hydrant record keeping.~~

~~No~~[0004] A global registry currently ~~exists and therefore no~~ does not exist for many owned asset areas and more specifically in the fire hydrant space resulting in a lack of global knowledge ~~is~~ available when making widespread decisions regarding fire hydrants or a water system. The disadvantage of using current fire hydrant management software is the limitation of communication within the department and interdepartmentally. Commonly the person who inputs the data is not the one who uses the data, the software is limited to a specific computer, and the system of inputting and using data relies on the location and type of the specific computer. For example, the fire department personnel may inspect the fire hydrant and document required maintenance, but the hydrant maintenance crew (commonly water department personnel) does not have easy access to the software and cannot review or update required maintenance. Also, the maintenance crew does not have an easy way to communicate the status of a damaged hydrant to the fire marshal. ~~No~~There is not a software program that gives none department the ability to share their information with other departments either using the same software or using other software. ~~In the same sense,~~

[0005] Currently there is ~~no~~not a standard format for collecting fire hydrant information. If there were a way to share a local database globally, the information would not likely integrate well. ~~Even if there~~ using current software and inspection methods. Even if there were a way to integrate the different data types, third party groups like state fire marshals, insurance groups, and the general public would not have access to the data without the correct software. Therefore, the state fire marshal continues to be ~~ignorant~~uninformed of the state's fire hydrant conditions, insurance groups have to give higher premiums because of their uncertainties, and the general public has less ~~care for~~awareness of the water system and the crews that ~~maintains~~maintain it. The general public also has no communication with the fire department when trying to assess how they can volunteer their services in programs such as 'Adopt a hydrant' or 'Paint a hydrant'.

~~The~~^[0006] Further, current software ~~programs also fail~~^{fails} to record all the available data upon an inspection. For instance, no currently available software allows input of results from a water quality test, a digital picture, GPS location, suggested maintenance, owner, or owner's address (as examples).

~~All~~ Other approaches fail to generate reports ~~summanzngs~~^{summarizing} an area's data such as manufacturer's reliability, flow availability, or departmental maintenance performance. Additionally, software programs are generally expensive and require their own maintenance. Adding licenses of the software to other computers can also be expensive. Many of the prior approaches fail to keep good fundamental records which affect the departments I.S.O. score and affects the local businesses and residence's fire insurance ~~premmms~~^{premiums}.

^[0007] Additionally, all previous approaches are tailored for input by a government agency such as a fire department or maintenance crew. This generally discourages the department from seeking independent (and unbiased) private companies to inspect and maintain fire hydrants. Allowing an accessible format to independent contractors would allow cheaper maintenance costs and saves the department and taxpayer's money.

~~Create a complete list of data entry fields that can be collected at a fire hydrant. Research the typical and non-typical groups that are impacted by fire hydrants and city infrastructure. For example, including things such as GPS location will be beneficial to non-typical parties such as land surveying, also collecting information on water quality will be beneficial to the Environmental Protection Agency, and hydrant number and quality will be beneficial to a departments financial officer.~~

~~After creating an all-inclusive standard for hydrant (and related) data, create an online database to store and share all collected information. Having an online database on the World Wide Web offers a common standard that everyone with Internet can access.~~

~~Create a filtering process for the database so that users of the registry can view data sets based on specified criteria. Also allow them to organize the results in any order and by any specific data field. For example, allow a user to search all the hydrants in the city of Gig~~

Harbor, Washington that have a flow greater than 1500 gpm and require maintenance.

The results will be shown in a table form. The user can then manage this data set or again filter the results into a more specific data set. The table form will have an option to see a thumbnail view of the digital picture of the hydrant. Any specific hydrant can be selected in table form to open the entire data on that hydrant. Also in table form, the user can 'Select All' (or 'Unselect All') or specifically select (or unselect) hydrants from the data set. Selected hydrants can be printed or emailed. This filtering/search tool will be useful in managing the data to meet users needs.

Create a program to serve the registry that can summarize specific fields of a subset of the database. For example, a search for all the hydrants in Gig Harbor, Washington that require critical and important maintenance reveals 32 hydrants. A summary list of the total material needed and labor required can be reviewed and printed. Through the use of a bidding program that also serves the registry, bids can be requested, received, and organized from private registered companies to supply and repair work. The hydrant owner can then contact the winning bidder.

Create an online hydrant information form as well as a physical paper document form to distribute to fire departments, the state fire marshals, city permit desks, and other government agencies with a letter encouraging them to use this new standard format for collecting information on fire hydrants and the benefits of using this new format. All newly permitted fire hydrants will record as much data as possible and most importantly, the owner, the owner's contact information, the location of the hydrant, and any required service agreement.

Contact hydrant inspection and maintenance companies to register with the global registry and to start using the standard form. Create a list of registered hydrant maintenance companies online for hydrant owners to call if needed.

Also, encourage government agencies to participate in using the global registry as their standard. Additionally, contact hydrant management software companies to program

compatibility with the global registry.

~~Protect the database by securing accessibility through registered users with username and password. Registered users will have access and will set accessibility based on a rank they are given by the managers of the registry. Higher level access will be Global, Federal, State, and Local. Lower level access will be Third Party, Registered General Public, and non-registered general public. Private hydrant owners will be given a Private rank and have access and set accessibility of their hydrants. Higher level rank users will have access to all information regardless of settings and will be able to set accessibility for lower rank users. For example, a state fire marshal will always have access to every hydrant in the registry but may choose to limit accessibility to specified hydrants or even specific information of the hydrant. A local fire marshal would be registered with a 'Local' rank. He could choose to specifically limit access of the hydrant's maintenance records in his district. A state fire marshal (ranked 'State') would not be limited by the local fire marshal and, in fact, could choose to override the local fire marshals settings and allow full access to the general public or whoever. This hierarchy of accessibility management allows authorities to protect important information regarding their water system infrastructure. Private owners of fire hydrants will always have full access to their hydrants in the database but is still subject to Local, State, and Federal settings. For example, a Private fire hydrant owner may limit accessibility to his fire hydrant information entirely, but is overridden by the Local Fire Marshal's setting that requires all hydrants report the size and number of outlets and flow. The 'Global' ranking is generally reserved for the managers of the global registry who has access to all information. They use the information to create overall reports such as the number of hydrants in a state, the quality of manufacturers, etc. The reports do not offer specific information about the hydrants and are available to all users (registered and non-registered). They also monitor activity and settings by registered users and determine if it's in the registry's best interest to keep those settings or override them.~~

~~Create a program to search the database for incorrect and erroneous data. This will~~

improve the quality of the data that will give users more accurate reports for their varying needs.

Create a program that allows different registered parties (such as a State FM or a Local FM) to communicate concerns regarding hydrant data. The program will allow a registered party to choose to be automatically updated on specific changes for a specific area. Encourage use to third parties such as the I.S.O., the E.P.A., planning and development agencies, land surveying agencies, city financial officers, private hydrant owners, and the general public.

This invention also covers the model of collecting data with a computer (laptop, tablet, p.d.a. or other) using a customized software program for inputting specific data (GPS, picture, typed, selected, scanned, or received wirelessly). Employee information is also inputted (name, work hours, etc.). The data is transmitted and received via wired or wireless network to a database. Information regarding worker's name, hours worked, etc is sent to accounting software for automatic billing and payroll. Information regarding the specific data collected in the field is sent to a 'global' database. Using custom software the 'global' database is viewable, searchable, and manageable directly from a computer or on a website. This 'turnkey' model can be used by anyone who needs to collect and manage data.

Examples include telephone poles, street lights, traffic lights, streets, trees, bridges, mailboxes, animal tracking, automobiles, warehouse inventory, fire department connections, post indicator valves, signs, fire sprinkler systems, and other utilities.

One specific feature of the global registry that is new and non-obvious is the standard for hydrant information collection. No other standard considers the use of GPS in locating hydrants, a digital picture for visual reference, water quality results, hydrant conditions, hydrant environment conditions, suggested maintenance, ownership and contact information, hydrant make, or hydrant model.

Another specific feature of the global registry is its online accessibility. The registry is accessible on the World Wide Web at www.hydrantregistry.org and also www.nrfu.org. Other

accessible domain names are ~~VVvw.hydrantregistry.com, vwww.grf11.org, and???~~.

~~The general field of the~~ **SUMMARY OF THE INVENTION**

[0008] A method for using a web registry to track the inspection compliance of an owned asset including notifying an owner of an asset that an inspection is needed to comply with a code. Electronically transmitting a list of at least one qualified inspector to a user. Receiving a completed inspection uploaded from an inspector. Transmitting the completed inspection to an approving authority. Completing a monetary transaction between the asset owner and the inspector when the inspection is approved by the approving authority.

[0009] A system for a web based compliance registry including a database configured to store owned asset information. A user interface in data communication with the database configured to show owned asset information on a display. A handheld device configured to wirelessly connect to the user interface and with the database in order to input and view owned asset data wirelessly and specific information based on its global position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The preferred and alternative embodiments of the present invention are described in detail below with reference to the following drawings.

[0011] FIGURE 1 illustrates an example of a computing system environment on which an embodiment of the invention may be implemented;

[0012] FIGURE 2 illustrates an exemplary computer network system on which an embodiment of the present invention may be implemented;

[0013] FIGURE 3 shows an example system showing a web based compliance registry in one embodiment;

[0014] FIGURE 4 shows a database relationship table in one embodiment for a web based registry for inspection compliance;

[0015] FIGURE 5 shows a method for using a web enabled inspection registry;

[0016] FIGURE 6 shows a method of using the registry in one embodiment;

[0017] FIGURES 7-17 show example screenshots of one embodiment of the web registry for inspection compliance used for fire hydrants; and

[0018] FIGURES 18-23 shows screenshots of one embodiment of the web registry for

inspection compliance used for fire hydrants and accessed from a mobile device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] When trying to manage a registry of owned assets and more specifically fire hydrant inspections, there generally are multiple parties who are inputting data and using the data stored in the registry. There are a vast number of hydrants in a typical sized city and each preferably receives an annual inspection and some periodic maintenance. Without the inspections the fire hydrant may not be able to be properly used in case of an emergency. Further the hydrant may be leaking water or be otherwise unsafe. There are a number of groups that typically inspect hydrants and most do not communicate with each other. For example a private neighborhood association and the fire marshals do not communicate inspection results with each other. Once the inspection has been completed the information should be used by a firefighter when sent to a fire. In order to be a useful system, the firefighters should be able to see which, if any, of the hydrants in the area of the fire are available for use and properly functioning. Efficiently finding and activating a working hydrant in the area may be the difference in the survival of personnel and total destruction of the burning building.

[0020] Systems and methods for a web based registry compliance tool are described in further detail below. One embodiment of the invention comprises a series of steps to ensure that the inspection takes place and the inspection results are placed online in the web based registry. The series of steps advantageously take an owner of an asset from a notification that an inspection is needed, through bidding for an inspector, inspection, approval and payment and finally posting of the inspection in the registry. The registry further stores location information in order to allow a user with a global positioning system and access to the web based registry to review the status of all of the hydrants in the general area.

[0021] By way of an example in the fire sprinkler industry, national code requires annual inspections of fire sprinkler systems and related components (such as standpipes, fire department connections, fire pumps). In one embodiment, the fire marshal/building official will input information via the online registry regarding properties with fire sprinkler systems after

initial inspection. A year later, the property owner will receive notice (via email, physical mail, or other) that the fire sprinkler system is due for annual inspection. The fire marshal will receive weekly or monthly updates of all due and overdue inspections. He/she will then use the registry to communicate to the owner his intention to enforce the inspection and the requirement for using the registry. The owner will use the registry to find qualified inspection companies and/or request bids from participating inspection companies. The registry will manage the bidding process and return the results to the owner for selection. The inspection company will use the registry to advertise their service and receive requests for bids and/or work. They will also use the registry (via the web or mobile device) to input their inspections with or without deficiency information which the registry sends to the fire marshal for review per the fire marshal's declared preferences. Depending on his preferences, he/she can review the inspection, verify city business license status of the inspection company, verify inspector qualifications, and approve, disapprove, or just confirm the inspection. He/she can also separately detail a course of action to an owner regarding any found deficiencies. The registry communicates the approval process between all parties until approval or confirmation is received. At that time the owner is notified the inspection is complete and approved and awaiting payment. The registry prepares an invoice for the inspection company to send to the fire sprinkler system owner. The owner receives the invoice and is able to pay online through the registry. Money is transferred to the inspection company, to the city (for any declared city/FM charges), and to any other necessary parties.

The registry sends a message to the inspection company to confirm payment has been received. The inspection company verifies payment. The registry confirms that all transaction fees and fire marshal review fees are paid. If fees are not paid then the final submission will not be complete. The inspection is sent to the registry for final submission when payment is confirmed and the registry transaction fees and fire marshal review fees are paid. Until then the registry continues to notify the fire marshal that the inspection is due/incomplete.

[0022] FIGURE 1 illustrates an example of a computing system environment 100 on which an embodiment of the invention may be implemented. The computing system

environment 100, as illustrated, is an example of a suitable computing environment; however it is appreciated that other environments, systems, and devices may be used to implement various embodiments of the invention as described in more detail below.

[0023] Embodiments of the invention are operational with numerous other general-purpose or special purpose computing system environments or configurations. Examples of well-known computing systems, environments, and/or configurations that may be suitable for use with embodiments of the invention include, but are not limited to, personal computers, server computers, hand-held or laptop devices, multiprocessor systems, microprocessor- based systems, set-top boxes, programmable consumer electronics, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

[0024] Embodiments of the invention may be described in the general context of computer-executable instructions, such as program modules, being executed by a computer. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Embodiments of the invention may also be practiced in distributed-computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote computer storage media including memory storage devices.

[0025] With reference to FIGURE 1, an exemplary system for implementing an embodiment of the invention includes a computing device, such as computing device 100. The computing device 100 typically includes at least one processing unit 102 and memory 104.

[0026] Depending on the exact configuration and type of computing device, memory 104 may be volatile (such as random-access memory (RAM)), nonvolatile (such as read-only memory (ROM), flash memory, etc.) or some combination of the two. This most basic configuration is illustrated in FIGURE 1 by dashed line 106.

[0027] Additionally, the device 100 may have additional features, aspects, and functionality. For example, the device 100 may include additional storage (removable and/or non-removable) which may take the form of, but is not limited to, magnetic or optical disks or

tapes. Such additional storage is illustrated in FIGURE 1 by removable storage 108 and non-removable storage 110. Computer storage media includes volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. Memory 104, removable storage 108 and non-removable storage 110 are all examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by device 100. Any such computer storage media may be part of device 100.

[0028] The device 100 may also contain a communications connection 112 that allows the device to communicate with other devices. The Communications connection 112 is an example of communication media. Communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, the communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio-frequency (RF), infrared and other wireless media. The term computer-readable media as used herein includes both storage media and communication media.

[0029] The device 100 may also have an input device 114 such as keyboard, mouse, pen, voice-input device, touch-input device, *etc.* Further, an output device 116 such as a display, speakers, printer, *etc.* may also be included. Additional input devices 114 and output devices 116 may be included depending on a desired functionality of the device 100.

[0030] Referring now to FIGURE 2, an embodiment of the present invention takes the form of an exemplary computer network system 200. The system 200 includes an electronic client device 210, such as a personal computer or workstation, that is linked via a communication medium, such as a network 220 (*e.g.*, the Internet), to an electronic device or

system, such as a server 230. The server 230 may further be coupled, or otherwise have access, to a database 240 and a computer system 260. Although the embodiment illustrated in FIGURE 2 includes one server 230 coupled to one client device 210 via the network 220, it should be recognized that embodiments of the invention may be implemented using one or more such client devices coupled to one or more such servers.

[0031] The client device 210 and the server 230 may include all or fewer than all of the features associated with the device 100 illustrated in and discussed with reference to FIGURE 1. The client device 210 includes or is otherwise coupled to a computer screen or display 250. The client device 210 may be used for various purposes such as network- and local-computing processes.

[0032] The client device 210 is linked via the network 220 to server 230 so that computer programs, such as, for example, a browser, running on the client device 210 can cooperate in two-way communication with server 230. The server 230 may be coupled to database 240 to retrieve information there from and to store information thereto. Database 240 may include a plurality of different tables (not shown) that can be used by the server 230 to enable performance of various aspects of embodiments of the invention. Additionally, the server 230 may be coupled to the computer system 260 in a manner allowing the server to delegate certain processing functions to the computer system.

[0033] Still referring to FIGURE 2, and in operation according to an embodiment of the invention, a user (not shown) of the client device 210 desiring to use a web based compliance registry on a browser application running on the client device to access web content served by the server 230.

[0034] Still referring to FIGURE 2, and in operation according to an alternate embodiment of the invention, a user (not shown) of the client device 210 desiring to use a inspection web registry on a browser application running on the client device to access web content, which may, but need not, be served by the server 230. Specifically, by employing an appropriate uniform resource locator (URL) in a known manner, the user may run or download from the server 230 and install on the client device 210 a user interface module 280 comprising computer-executable instructions as described more fully hereinafter.

Alternatively, the user may receive the module 280 on a tangible computer-readable medium (not shown), such as, for example, a CD-ROM, and subsequently install the module on the client device 210 from the medium.

[0035] FIGURE 3 shows an example system showing a web based compliance registry in one embodiment. The system includes a client device 370 connected to the internet 320 through a network or other internet connection. Once connected to the internet 320, the client device 370 accesses a web based compliance registry configured to show information on inspection compliance for an owned asset. In one embodiment, the owned asset is a fire hydrant inspection database. The web based compliance registry is shown to the user using a web interface. The web interface is linked to at least one database 380 containing web based compliance registry information. In one embodiment, the web enabled interface is connected to both a proprietary mobility server 310 and a global registry of hydrants database 380 in order to exchange information related to fire hydrants 360. Hydrant information is stored in the database 380 and using a search program allows users to manipulate or view hydrant data.

[0036] In one embodiment a handheld device 340 referred to as a scout device is included. The handheld device 340 is a handheld computing device, or system of a type known in the art, such as a handheld computer, wireless mobile telephone, personal digital assistant device, and the like. Handheld device 340 may comprise one of many well known handheld devices including, but not limited to a Palm Treo, a Blackberry or other handheld devices. Handheld device 340 comprises such software, hardware, and componentry as would occur to one of skill in the art, such as, for example, one or more microprocessors, memory systems, input/output devices, device controllers, wireless connectivity and the like. Handheld device 340 also comprises one or more data entry systems operable by a user of handheld device, such as, for example, a pointing device, keyboard, touch screen, microphone, voice recognition, and/or other data entry systems known in the art. Handheld device 340 further comprises a display system which may comprise many of the well known display devices such as liquid crystal diode displays, light emitting diode displays, etc., upon which information may be displayed in a manner perceptible to the user. Handheld device 340 may also comprise a data receiving system including, but not limited to a bar code reader, digital camera, GPS

coordinates, Bluetooth, wireless connectivity, cellular connectivity, radio frequency identification software or an iris or fingerprint recognition system. The handheld device 340 having software to communicate with the web enabled interface wirelessly in order to update the hydrant registry. The handheld device 340 configured to update information about assets (including, but not limited to, a current location). The handheld device 340 further includes the following list of non exhaustive list of features: data is both manually and automatically inserted into the computer; coordinates from the GPS unit can be manually or automatically downloaded into the computer; pictures from the camera are automatically downloaded to the computer; the communication connection between the computer, the GPS unit, and the camera may be hardwired or wireless (such as Bluetooth) and/or a data entry program then utilizes the phone to upload (and download) data to the web based compliance registry.

[0037] In an alternate embodiment the system further includes the use of RFID chips to update information about assets (including, but not limited to, a current location). For example a hydrant would have an RFID chip and would transmit inspection data to a handheld device when the handheld device was within range.

[0038] FIGURE 4 shows a database relationship table in one embodiment for a web based registry for inspection compliance. Shown is a database configured to store information including but not limited to; hydrant ownership, make, model, year, color, condition, rating of needed maintenance (critical, important, light, or none), specific recommended maintenance, pressure, flow, GPS location, address, time of inspection, environment conditions during inspection, landscaping, digital picture of hydrant, nozzle size and orientation, physical description of hydrant, special markings, service record, water quality, and hydrant number.

[0039] FIGURE 5 shows a method for using a web enabled inspection registry. At block 510 an owner/inspecting authority is notified that an inspection is needed on an owned asset. The notification is preferably generated based on an annual inspection. However in the case of an initial setup of the registry it also may be the initial request for information from an inspecting authority or it may include a request for further information from a concerned citizen. By way of example, the registry transmits notification to initially register with the registry and to perform an inspection and in the future notifies an owner when a subsequent inspection is necessary. Preferably the

owner is sent recommendations on how the property is to be inspected, for example recommendations include names of inspectors, types of inspection needed and general costs associated with the inspection. The notification step is also used to alert the inspecting authority that an inspection is due. The inspecting authority is generally the organization in charge of ensuring compliance of the owned asset. For example a fire marshal is the inspecting authority for fire sprinkler systems. Generally, the inspecting authority receives information relating to all of the owned assets in their area of responsibility that are in need of an inspection.

[0040] At block 520 inspection preparation is done by both an owner of an asset and by an inspector. Once an owner receives notification he/she begins the inspection process by reviewing a list of inspectors and requesting bids for the job. The owner may select their own inspector or may use the web based compliance registry to find a qualified inspector or inspectors. In the registry a list of inspectors is available that includes licensed and bonded inspectors. Once a user has selected inspectors a bidding process is initiated in order to provide users with a list of prices for an inspection. The selection and bidding process is enabled using the web based registry interface. Through the user interface to the web based compliance registry a user is able to review the inspector and his/her credentials, review a bid for the inspection and finally select and schedule an inspection with one of the listed inspectors.

[0041] At block 530 an inspection takes place. The chosen inspector inspects the owned asset based on standard industry inspection rules and regulations. In order to perform the inspection, the inspector either carries with him/her an inspection sheet that includes an area to enter in all information required by an embodiment of the web based inspection registry or uses a handheld device to perform the inspection. Generally, if an inspector uses the pen and paper means for an inspection the inspector or the asset owner will update the registry manually using the data recorded on site. In another embodiment the inspector uses a web enabled handheld device configured to interface wirelessly with the internet or directly with the registry database. The inspector uses the device to enter in the inspection information and advantageously can print or transmit the inspection to a reviewing authority from the web based compliance registry.

[0042] At block 540, the inspection, after being loaded into the registry, goes

through a review period. The review is conducted by the approving authority and is done to ensure the inspection is completed in compliance within the rules and regulations of the inspection. This allows the approving authority the ability to quickly review each inspection and provide feedback to the inspector at the earliest convenience. Once the reviewing authority has approved the inspection. The registry sends an invoice to the asset owner in order to arrange for payment. The registry allows for the owner to pay online and then sends payment to the inspector therefore completing the transaction. By way of an example once an inspection is complete previously submitted credit card information is billed for the inspection which preferably includes the inspector's fee, the fees for filing an inspection with the approving authority and registry fees. Deficiencies noted then the authority is able to cvontact owner and provides coa's

[0043] At block 550, the inspection is complete and the information is updated on the system to reflect a completed and valid inspection. Once updated the information is advantageously viewable by all interested parties.

[0044] FIGURE 6 shows a method of using the registry in one embodiment. A user may carry a wireless handheld device to input data as discussed above, but also the handheld device may be used to display inspection status and details of the assets in the user's

proximity. At block 610, the unit receives a global positioning system location and with that information at block 620 displays the assets in proximity to the user. The user may use this display to inspect the assets or send reminders to the owners that there asset still needs to be inspected and view asset details. In one embodiment the handheld device may be used by firefighters as they are responding to jobs to see the most recently inspected and approved hydrants and hydrant details in there vicinity.

[0045) FIGURES 7-17 show example screenshots of one embodiment of the web registry for inspection compliance used for fire hydrants. FIGURE 7 shows a login screen in one embodiment. The user will have preferences and permissions based on whether they are an owner, inspector or an authority. FIGURE 8 shows a create hydrant screen which allows a user to add information about a hydrant. FIGURE 9 shows a hydrant search screen which allows a user to see the results of a typical hydrant search along with identification information about the hydrants. Included in the results screen are pictures of the hydrants if available as well as other identification information such as address and type. FIGURE 10 shows a hydrant search using a map. On this screen a user uses an interactive map to find a location. Once the location is selected a graphical representation of the hydrants in the area is shown to the user. FIGURE 1-1 shows a view of the hydrant details accessible from the hydrant search page shown in FIGURES 9 and 10. FIGURE 12 shows a graphical representation of hydrants in an area on a map as selected by a user. FIGURE 13 shows a screen that allows a user to customize the screen views of the program described in one embodiment. FIGURE 14 shows a user management screen in which an administrator can set users and change permissions of those users. FIGURES 15-17 show time card entry screens in which a user or an inspector records time spent on inspecting a hydrant for a future payment in one embodiment.

[0046) FIGURES 18-23 shows screenshots of one embodiment of the web registry for inspection compliance used for fire hydrants and accessed from a mobile device. FIGURE 18 shows a login screen used on a mobile device. FIGURE 19 shows the home screen for the handheld device, allowing a user to create a hydrant, search for hydrants in proximity to the handheld device, login/logout and start a time card. FIGURE 20 shows a create hydrant screen which allows a user to add information about a hydrant. FIGURE 21 shows a proximity

search screen displaying information about hydrants in proximity to the device. FIGURE 22 shows the home screen with the time for the time card started. FIGURE 23 shows a screen allowing a user to enter notes about their time entrees on the handheld device.

[0047] The global registry is intended to assist the government, private owners, insurance bureaus, businesses, and the general public in providing information regarding hydrant condition, location, and water quality. The most important purpose is to prepare the fire department for the hydrant and water conditions prior to arriving at a fire incident. This preparation will improve the approach of extinguishing a fire by showing the best hydrant for the fire department to connect to and also give visual reference of that hydrant prior to arriving at the site. This improvement will allow a fire department to put more water on a fire quicker and save lives and property. Non-working or low performing hydrants will be identified prior to arriving at the site and avoided. Another major purpose of the registry is to assist maintenance crews in locating and preparing work on hydrants in need of service. Equally important, these needed and/or finished repairs are communicated back to the fire marshal and fire department. This vital communication will inform the fire fighters of hydrant conditions. The state fire marshals are able to review the performance of local fire marshals and maintenance crews. The improved method of record keeping hydrant information will improve a city's ISO (insurance) rating which will save money in fire insurance premiums for local businesses and homes. The web based compliance registry is optionally advantageous to improve the process of inspections and in many cases introduce a new ability to enforce inspections. The authorities will be able to easily monitor, require, enforce, review, approve, and summarize all the inspections under their control. This new method will provide an easier way for them to charge for their review time and a way to confirm inspection companies are licensed to work in their city. This will help the cities recuperate lost expenses previously overlooked or ignored.

[0048] Multiple embodiments may be advantageously used by the following non exhaustive list of users. Budgeting committees will use the registry to more accurately predict annual maintenance and repair costs. Private hydrant owners will register their hydrants in the global registry which will notify the owner when inspection and testing is required. Fire hydrant maintenance crews will use this registry to schedule and prepare necessary maintenance

at specific fire hydrants. An inspection crew will use the registry to record all findings regarding a fire hydrant test and inspection. The fire department will use the registry when preparing for a fire by researching the hydrant condition, the GPS location, the GIS map, and the digital picture for a visual confirmation prior to arriving at the site. The local fire marshals will use the registry to verify progress of the maintenance crews. State fire marshals will use the registry to review the status of fire hydrants in a specified area (statewide, citywide, or other). Insurance companies and rating bureaus will use the registry to assist them in accurately grading a state, city, district, business, neighborhood, or house based on the conditions and location of hydrants. The Environmental Protection Agency (EPA) and the general public will use the registry to verify a state's or city's compliance with the Safe Water Drinking Act and general information about the water quality. City engineers and planning and development agencies will have multiple uses for the registry. Hydrant manufacturers would use the registry to determine the performance of their products and at the same time, relate it to competitor's products. Consumers will use the registry to determine more reliable products based on a specific make and models past performance. Installation, testing, inspection, service, repair, and material supply companies will register with the global registry which will allow them to receive orders or bid requests for their service or material. The general public will use the registry to verify the quality of public fire hydrants. Civil Engineers and Surveyors would use the fire hydrant GIS maps and GPS locations in the registry as survey points during planning and development. Financial officers will use the registry to determine current infrastructure assets for accrual accounting practices in accordance with GASB-34.

[0049] In alternate, yet related embodiment a Closed System Fire Hydrant Water Flow Test ~~4~~is disclosed as a means for inspecting fire hydrants while maximizing environmental protection. Specifically, it is the protection of the environment from water damage caused by flowing fire hydrants. The system further controls drainage during and after a fire hydrant flow test or flushing. Other fields ~~classifiable~~affected by this inventionthe system include, but are not limited to, water conservation, landscape protection, water main flushing, water quality testing, and hydrant maintenance and testing. The specificGenerally the following groups thatwill advantageously benefit from this invention are private hydrant owners, general public, fire

departments, water departments, water companies, hydrant testing and maintenance companies, and the Environmental Protection Agency (EPA). ~~Another unique invention that is being created for use in this~~The close system ~~is~~fire hydrant water flow test system, in one embodiment, further includes a fire hydrant in-line electromagnetic flow meter. ~~This in-line flow meter is one of the devices in the closed system.~~

~~The 'Closed System' is a new method of testing and maintaining fire hydrants that protects the environment from water damage. It is also a method of controlling drainage during and after a fire hydrant flow test or flushing.~~

~~The 'Closed System' is also a device consisting of a water passage device such as hose or pipe connected to a water control valve and an in-line flow meter connected to a tank for collecting the water. The tank is further connected to a water control drain valve which may be connected to hose or pipe. It is a 'closed system' because it does not allow the water to flow uncontrolled into the 'open environment'.~~

~~The 'Closed System' is the product of these devices connected together for the purpose of controlling water flow from fire hydrants.~~

[0050] Hydrant inspection and testing companies advantageously can improve the quality of their testing and obtain more consistent results. Companies and jurisdictions responsible for testing hydrants will be able to provide a safer test for the environment and immediate landscaping. This product will decrease the amount of flow time on a hydrant allowing the testing party to test more hydrants per day. ~~(This also conserves water).~~ A closed system test will allow testing parties to safely and quickly test hydrants located in high traffic areas such as downtown or on highways. ~~(This, which~~ was previously unpractical to do because the danger of expelling thousands of gallons of water over roads with high traffic~~).~~ Some hydrants are located in areas with protected landscaping or environmentally protected areas. Testing parties will now be able to test these hydrants ~~with new~~without impact to the environment. ~~They~~Testers will also be able to control drainage of water collected by these tests into areas that are capable of supporting the necessary water flow. Other applications include

testing fire pumps, water pumps, water tanks, or any other water source. In addition, the product could be used to test other liquids. Other applications for the Closed System Fire Hydrant Water Flow Test ~~is advantageously~~advantageously applied when water reservoirs are low, such as during drought seasons; and the system may be further adapted for performing water quality testing, obtaining GPSOPS surveying information, and conveying the GPSOPS surveying information to data storage mediums, for example a personal computer database or PDA device, in the form of text, pictures, and GPSOPS data. Application of testing and flushing fire hydrants to a tank will allow testing/flushing companies to preserve water, landscaping, and environment while servicing. Additional commercial applications include the rental or sale of such systems that would allow owners, private contractors, government agencies, etc to test fire hydrants. The system would preferably include a pipe or hose connected to a flow meter device connected by pipe or hose to a control valve connected by pipe or hose to a tank (such as a water tank truck, or tank trailer). ~~The tank~~The tank would be connected by pipe or hose to a drain valve in order to discharge the water into a safe area.

~~would be connected by pipe or hose to a drain valve, and to discharge to a safe area.~~[0051]

~~The method of testing a hydrant to a closed system would be protected by such a system.~~

~~The purpose of the invention is to assist parties in testing hydrants quicker and safer, to protect the areas around the hydrant, and to provide a method for a consistent test. The NFPA requires that hydrants be tested annually. By our current methods, few to no cities are able to meet this requirement. The more hydrants that are tested annually will lead to more hydrants working when they are needed in an emergency. Example: the city of Seattle has 18,000+ hydrants. 25% of these hydrants are tested annually. That means 75% of the hydrants are not tested per code and may not work when needed costing the fire department seconds or minutes, risking lives, property, and money. Speeding up testing will reduce the cost and allow departments to adhere to testing code. This method of testing will also conserve the amount of water needed for an accurate and consistent test by cutting water consumption approximately 90%. In addition, testing every hydrant annually will improve water quality.~~

~~Fire departments, water departments, maintenance crews currently test straight to the environment and landscaping. Some products ("Hydrant Monster") use hoses to direct flow through hoses to an immediate area. Flushing is done over an extended amount of time. Closed System preferably includes all, at certain selected hydrants (not each hydrant). Water quality testing is done sparsely or as needed. Tests are done with a pitot gauge held in the stream of high flow water and documented for calculations at a later time. Testing in most cities is not done at all hydrants on an annual basis. Major Washington State cities are tested every 2, 4, or even 10 years (Everett) according to local TV news reports. No care is taken in drainage of water. Thousands of gallons of water simply travel to the lowest point from the hydrant whether the area or drain is capable of handling the capacity or not. Damage frequently occurs at these locations as well.~~

~~The disadvantages of the prior approaches are the damages they cause to the environment, the waste of water, the poor water quality, inconsistent testing producing inconsistent results, and damage to the hydrant itself. Hydrants are placed per code which does not take into account the areas ability to withstand high velocity water flows or ability to drain thousands of gallons of water. Current methods take little to no consideration of the damage to the environment. Hydrants in areas with high traffic (downtown metropolis or highways) are often not tested because of the danger of introducing huge volumes of water to traffic. The "Hydrant Monster" directs water using a hose with a two-way outlet but only as far as the hose can reach. In the middle of a downtown metropolis this will not help. Current methods require over 2000 gallons of water per hydrant. The 18,000 hydrants in Seattle require over 36,000,000 gallons to test (compared to approximately 3,600,000 gallons with our method). That translates to over 32 million gallons of water wasted. Hydrants often are damaged by the testing due to improper shut down after a flow test. This is called 'water hammer' and is caused by the high velocity water hitting the shut-off valve. (Our test utilizes a separate shut-off valve within the closed system, therefore no hydrant is in danger of 'water hammer'.) The current method of testing with a pitot tube is very~~

~~inconsistent. Holding a gauge in a water stream flowing 2000 gallons per minute will produce inconsistent results. The tester is responsible for holding and reading a gauge that is normally 'bouncing' between two numbers and while thousands of gallons are spilling and collecting all around him (extreme conditions).~~

~~Assemble a closed system consisting of a hose, least one or a plurality of the following non exclusive list of features: a water passage device such as hose or pipe connected to a water control valve and an in-line flow meter connected to a tank for collecting the water. The tank is further connected to a water control drain valve which may be connected to hose or pipe. The closed system further includes: a shut-off valve, a 'through' flow meter (such as an electromagnetic flow meter), and a tank (such as a water truck). Allow The tank to gauge gauges and manage manages the amount of water so as to assure proper flow test results (such as a tank level alarm, and/or an overflow outlet, and a drain valve. Connect the~~

[0052] In one embodiment a method for using a closed system include: connecting to a water source such as fire hydrant. Close, closing the shut-off valve within the closed system. Open, opening the fire hydrant gate valve allowing water to enter the closed system up to the closed shut-off valve. Quickly open, quickly opening the shut-off valve in the closed system. Take, recording a reading from the electromagnetic flow meter. Close, closing the shut-off valve in the closed system. Then close, closing the fire hydrant shut-off valve. Remove and removing the connection to the closed system.

~~We claim:~~

~~1.—~~[0053] While the preferred embodiment of the invention has been illustrated and described, as noted above, many changes can be made without departing from the spirit and scope of the invention. Accordingly, the scope of the invention is not limited by the disclosure of the preferred embodiment. Instead, the invention should be determined entirely by reference to the claims that follow.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A ~~fire hydrant~~ method for using a web registry system to track the inspection compliance of an owned asset and asset details comprising:

~~A computer having a central processing unit configured to receive microprocessor readable instructions;~~

~~And a plurality of microprocessor readable instructions configures to provide historical and active surveillance information of fire hydrants notifying an owner of an asset that an inspection is needed to comply with a code; electronically transmitting a list of at least one qualified inspector to a user; receiving a completed inspection uploaded from an inspector; transmitting the completed inspection to an approving authority; and completing a monetary transaction between the asset owner and the inspector when the inspection is approved by the approving authority.~~

2. The method of Claim 1 further comprising:

entering initial information about an asset that requires periodic inspection to comply with a code.

3. The method of Claim 2 further comprising:

accepting bids for an inspection job, the owner of an asset receiving bids from qualified inspectors based on the needs of the asset; and selecting a qualified inspector.

4. The method of Claim 3 further comprising:

transmitting a detailed course of action to an owner regarding any found deficiencies from an approving authority to an asset owner.

5. A method for using a web registry to track an asset owner's inspection compliance:

receiving a notification that an owned asset requires an inspection in order to be in compliance with a code;
receiving a list of qualified inspectors;

selecting an inspector from a list of qualified inspectors based on a bidding process;

receiving a notification that an inspection was completed and approved by an approving authority; and

completing a payment form in order to pay the elected qualified inspector.

6. The method of Claim 5 further comprising:

entering initial information about an asset that requires periodic inspection to comply with a code.

7. The method of Claim 6 further comprising:

accepting bids for an inspection job, the owner of an asset receiving bids from qualified inspectors based on the needs of the asset.

8. The method of Claim 7 further comprising:

inspecting the owned asset when selected by the asset owner in the bidding process using a handheld device wirelessly connected to the web based compliance registry.

9. A method for using a web based registry containing fire hydrant information comprising:

activating a handheld device configured to receive global positioning system location signals and wirelessly connected to the web registry containing fire hydrant information;

determining fire hydrants in proximity to the handheld device using the global positioning system location and the web registry containing fire hydrant information; and

displaying on a handheld device display a status of a plurality of fire hydrants within a predefined radius of the handheld device.

10. The method of Claim 9 further comprising:

displaying on a handheld device display detailed information about each fire hydrant within a predefined radius of the handheld device.

11. The method of Claim 9 further comprising:

displaying a route to the closest working fire hydrant to the handheld device.

12. The method of Claim 9 further comprising:

displaying a route to the closest non-working fire hydrant to the handheld device.

13. The method of Claim 10 further comprising:

entering a location of interest into the handheld device;

determining fire hydrants in proximity to the location of interest and the web registry containing fire hydrant information; and

displaying on the handheld device display a status of a plurality of fire hydrants in proximity to the location of interest.

14. The method of Claim 9 further comprising:

receiving radio frequency identification signals from a fire hydrant with an installed radio frequency identification chip.

15. The method of Claim 9 further comprising:

receiving information using the handheld device have a bar code reader from a fire hydrant with an installed barcode.

16. A system for a web based compliance registry comprising:

a processor;

a display;

a database in data communication with the processor and the display configured to store owned asset information;

a user interface in data communication with the database configured to show owned asset information on the display; and

a handheld device configured to wirelessly connect to the user interface and with

the database in order to input and view owned asset data wirelessly and to store specific information based on its global position.

17. The system of Claim 16 wherein the database is stored locally on a computer.

18. The system of Claim 16 wherein the database is accessible by a computer over a network connection.

19. The system of Claim 16 wherein the owned asset is a fire hydrant.

20. The system of Claim 19 wherein the database is configured to store fire hydrant information related to at least one of hydrant ownership, make, model, year, color, condition, rating of needed maintenance, specific recommended maintenance, pressure, flow, location, address, time of inspection, environment conditions during inspection, landscaping, digital picture of hydrant, nozzle size and orientation, physical description of hydrant, special markings, service record, water quality, and hydrant number.

SYSTEMS AND METHODS FOR A WEB BASED INSPECTION

COMPLIANCE REGISTRY AND COMMUNICATION TOOL

ABSTRACT OF THE DISCLOSURE

A method for using a web registry to track the inspection compliance of an owned asset including notifying an owner of an asset that an inspection is needed to comply with a code. Electronically transmitting a list of at least one qualified inspector to a user. Receiving a completed inspection uploaded from an inspector. Transmitting the completed inspection to an approving authority. Completing a monetary transaction between the asset owner and the inspector when the inspection is approved by the approving authority. A system for a web based compliance registry including a database configured to store owned asset information. A user interface in data communication with the database configured to show owned asset information on the display. A handheld device configured to wirelessly connect to the user interface and with the database in order to input and view owned asset data wirelessly and specific

[information based on its global position.](#)