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# **Comparison of Google Advanced Patent Database and Espacenet for Prior Art Search Enhancement**

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Abstract: Before filing or after filing a patent application, patent prior art search/state of the art search is done to check for novelty, nonobiviousness, industrial utility of the inventions/patent application which decides the patentability.in this manuscript, comparison of open source patent search databases is done to check which database picks up the keywords, reduces the iterations and gives accurate result.

Keywords: IPR, TRIPS, Google Advanced Patent, Espacenet.

## I. INTRODUCTION

IPR(Intellectual Property Rights) are the rights awarded by the society to individuals or organization over the creations of innovative work. They generally specify a time period during which others do not copy the innovations, Idea allowing him or her to commericalize it and recover any investment on research and development. Pior to TRIPS(Trade Related Intellectual property rights)Agreement, there are number of international treaties and conventions covering Intellectual Property Rights. the conventions covering geographical indications are Paris convention and Madrid Agreement(1891) and Lisbon agreement(1958) these treaties however failed to exert much influence and could not become competent. Berne convention for protection of literary and artistic works as one of oldest international treaties in copyright i.e rights of authors in literary and artistic works. Hague agreement covers the protection of industrial designs. Rome conventions defined as the standards of protection of related rights enacted to protect artistic and broadcasting organization. Patent co-operation treaty is to bring about the effectiveness and economy by simplying patent process .. International convention for protection of new varieties of plants was covered in 1991. New varieties require time money and effort. Trademark law treaty(1994)simplifies and harmonises administrative procedures with respect to national application and protection has endowed with intellectual created by beneficial faculty and same has been effectively utilized thereby improving the standard of living right from the stone age. It is a property which has been created by exercise of intellectual faculty. India has a long credible protection of IPR to a system of well developed substantiated laws and establishment of legal ,administrative infrastructure for IPR enforcement. The importance of patent system for innovative research and development which inturn causes the industrial development of a country. The progress and prosperity of a nation depend on level of scientific, industry and technological development. The inventors, research workers, entrepreneurs have to be encouraged, inspired, accelerate the research work, Research and Developmental activities by providing incentives and the rewards for their valuable work for the progress of the country. In the absence of any other bulletin system granting patterns for new inventors have to be accepted all over the world. Industrial property forms part of the broader concept of "intellectual property." The objects of intellectual property are the creations of the human mind, the human intellect\_hence the expression "intellectual" property. In a somewhat simplified way, one can state that intellectual property relates to pieces of information which can be incorporated in tangible objects at the same time in an unlimited number of copies at different locations anywhere in the world. The property is not in those copies but in the information reflected in those copies. Similar to property in movable things and immovable property, intellectual property, too, is characterized by certain limitations, for example, limited duration in the case of copyright and patents.

### A. The Two Branches Of Intellectual Property

1) Copyright: Copyright relates to artistic creations, such as poems, novels, music, paintings, cinematographic works, etc. In most European languages other than English, copyright is called author's rights. The expression "copyright" refers to the main act which, in respect of literary and artistic creations, may be made only by the author or with his authorization. That act is the making of <u>copies</u> of the literary or artistic work, such as a book, a painting, a sculpture, a photograph, a motion picture. The second expression, "author's rights" refers to the person who is the creator of the artistic work, its author, thus underlining the fact, recognized in most laws, that the author has certain specific rights in his creation, for example, the right to prevent a



distorted reproduction, which can be exercised only by himself, whereas other rights, such as the right to make copies, can be exercised by other persons, for example, a publisher who has obtained a license to this effect from the author

- 2) Industrial Property: Industrial property, is sometimes misunderstood as relating to movable or immovable property used for industrial production, such as factories, equipment for production. Typically, the creations to which industrial property relates are inventions and industrial designs. (Simply stated, inventions are solutions to technical problems, and industrial designs are aesthetic creations determining the appearance of industrial products.) In addition, industrial property includes trademarks, service marks, commercial names and designations, geographical indications (indications of source and appellations of origin) and the protection against unfair competition. Here, the aspect of intellectual creations—although existent—is less prominent, but what counts here is that the object of industrial property typically consists of signs transmitting information to consumers, in particular, as regards products and services offered on the market, and that the protection is directed against unauthorized use of such signs which is likely to mislead consumers, and against misleading practices in general.
- 3) The expression "industrial" property may appear not to be entirely logical because it is only as far as inventions are concerned that the main segment of economy that is interested in them is industry. Indeed, in the typical situation, inventions are exploited in industrial plants. But trademarks, service marks, commercial names and commercial designations are of interest not only to industry but also and mainly to commerce. Notwithstanding this lack of logic, the expression "industrial property" has acquired a meaning which clearly covers not only inventions but also the other objects just mentioned.
- 4) In the hall of the WIPO headquarters building, there is an inscription in the cupola whose text tries, in a few words, implicitly to define intellectual works. It also tries to convey the reasons for which intellectual works should be "property," that is, why their creators should enjoy advantages secured by law. Finally, the inscription invokes the duty of the State in this field. Naturally, the inscription makes no claim to legal exactitude. Its intent is to stress the cultural, social and economic importance of protecting intellectual property.

#### B. Inventions

As has already been said, inventions are new solutions to technical problems. This is not an official definition. Most laws dealing with the protection of inventions do not define the notion of inventions. However, the WIPO Model Law for Developing Countries on Inventions (1979) contained a definition which read as follows: "Invention' means an idea of an inventor which permits in practice the solution to a specific problem in the field of technology."

#### C. Patents

Inventions are characteristically protected by patents, also called "patents for invention." Every country which gives legal protection to inventions—and there are more than 140 such countries—gives such protection through patents although there are a few countries in which protection may also be given by means other than patents, as will be seen below.

- 1) The word "patent" is often used in two senses. One of them is the document that is called "patent" or "letters patent.
- 2) The other is the content of the protection that a patent confers
- 3) First of all, let us deal with the first sense of the word "patent," that is, when it means a document.
- 4) If a person makes what he believes is an invention, he, or if he works for an entity, that entity, asks the Government—by filing an application with the Patent Office—to give him a document in which it is stated what the invention is and that he is the owner of the patent. This document, issued by a Government authority, is called a patent or a patent for invention.
- 5) Not all inventions are patentable. Generally, patent laws require that, in order to be patentable, the invention must be new, it must involve an inventive step (or it must be non-obvious), and it must be industrially applicable. These three requirements, sometimes called the requirements or conditions of patentability, have been incorporated in Article 27.1 of the Agreement on Trade-Related Aspects of Intellectual Property Rights ("the TRIPS Agreement").

### D. Utility Models

Utility models are found in the laws of a limited number (about 20) of countries in the world, and in the OAPI regional agreement. In addition, some other countries (for example, Australia and Malaysia) provide for titles of protection which may be considered similar to utility models. They are called "petty patents" or "utility innovations." The expression "utility model" is merely a name given to certain inventions, namely—according to the laws of most countries which contain provisions on utility models—inventions in the mechanical field. Utility models usually differ from inventions for which ordinary patents for invention are available mainly in three respects: *first*, in the case of an invention called "utility model," either only novelty but no inventive step



is required or the inventive step required is smaller than in the case of an invention for which a patent for invention is available; second, the maximum term of protection provided in the law for a utility model is generally shorter than the maximum term of protection provided for a patent for invention; and <u>third</u>, the fees required for obtaining and maintaining the right are generally lower than those applicable to patents. Moreover, in certain countries there is also a substantial difference in the procedure for obtaining protection for a utility model: this procedure is generally shorter and simpler than the procedure for obtaining a patent for invention.

#### E. Industrial Designs

- Generally speaking, an industrial design is the ornamental or aesthetic aspect of a useful article. Such particular aspect may depend on the shape, pattern or color of the article. The design must appeal to the sense of sight. Moreover, it must be reproducible by industrial means; this is the essential purpose of the design, and is why the design is called "industrial."
- 2) In order to be protectable, an industrial design must, according to some laws, be new and, according to other laws, original. The requirements of novelty or originality has been incorporated in Article 25.1 of the TRIPS Agreement
- 3) Industrial designs are usually protected against unauthorized copying or imitation. Under Article 26.3 of the TRIPS Agreement, the duration of protection available shall amount to at least 10 years. Members of the said Agreement are also obliged to ensure that requirements for securing protection of textile designs, in particular in regard of any cost, examination or publication, do not unreasonably impair the opportunity to seek and obtain such protection
- 4) The document which certifies the protection may be called a registration certificate or a patent. If it is called a patent, one must, in order to distinguish it from patents for invention, always specify that it is a patent for industrial design.

#### F. Intellectual Property In Respect Of Integrated Circuits

- 1) The question of the type of protection to be given to the layout-design, or topography, of integrated circuits is relatively new. Although prefabricated components of electrical circuitry have been used for a long time in the manufacture of electrical equipment (for example, radios), large-scale integration of a multitude of electrical functions in a very small component became possible only a few years ago as result of advances in semiconductor technology. Integrated circuits aremanufactured in accordance with very detailed plans or "layout-designs.
- 2) The layout-designs of integrated circuits are creations of the human mind. They are usually the result of an enormous investment, both in the terms of highly qualified experts, and financially. There is a continuing need for the creation of new layout-designs which reduce the dimensions of existing integrated circuits and simultaneously increase their functions. The smaller an integrated circuit, the less the material needed for its manufacture, and the smaller the space needed to accommodate it. Integrated circuits are utilized in a large range of products, including articles of everyday use, such as atches, television sets, washing machines, automobiles, etc., as well as sophisticated data processing equipment.
- 3) Whereas the creation of a new layout-design for an integrated circuit involves an important investment, the copying of such a layout-design may cost only a fraction of that investment. Copying may be done by photographing each layer of an integrated circuit and preparing masks for the production of the integrated circuit on the basis of the photographs obtained. The high cost of the creation of such layout-designs, and the relative ease of copying, are the main reasons for the pretection of layout-designs.

#### G. Trade Names

- 1) Another category of objects of industrial property is "commercial names and designations."
- 2) A commercial name or trade name—the two expressions mean the same thing—is the name or designation which identifies the enterprise. In most countries, trade names may be registered with a government authority. However, under Article 8 of the Paris Convention for the Protection of Industrial Property, a trade name must be protected without the obligation of filing or registration, whether or not it forms part of a trademark. Protection generally means that the trade name of one enterprise may not be used by another enterprise either as a trade name or as a trademark or service mark and that a name or designation similar to the trade name, if likely to mislead the public, may not be used by another enterprise.

#### H. Geographical Indications

- 1) Finally, among commercial designations there are also geographical indications.
- 2) The TRIPS Agreement (Articles 22 to 24) establishes certain obligations as regards the protection of geographical indications, which are defined therein, for the purposes thereof, as "indications which identify a good as originating in the territory of a



Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin." The notions of "indications of source" and of "appellations of origin," which are used in the Paris Convention, encompass geographical indications as defined by the TRIPS Agreement.

- 3) An indication of source is constituted by any denomination, expression or sign indicating that a product or service originates in a country, a region or a specific place (for instance, "made in ..."). As a general rule, the use of false or deceptive indications of source is unlawful.
- 4) An appellation of origin is constituted by the denomination of a country, a region or a specific place which serves to designate a product originating there, the characteristic qualities of which are due exclusively or essentially to the geographical environment, in other words to natural and/or human factors. The use of an appellation of origin is lawful only for a certain circle of persons or enterprises located in the geographical area concerned and only in connection with the specific products originating there (for instance, "Bordeaux").

### I. Protection Against Unfair Competition

- 1) The last object of the protection of industrial property is the protection against unfair competition. Such protection, required under Article 10<u>bis</u> of the Paris Convention, is directed against acts of competition that are contrary to honest practices in industry or commerce. The following in particular constitute acts of unfair competition in relation to industrial property: all acts of such a nature as to create confusion with the establishment, the goods or the industrial or commercial activities of a competitor; false allegations in the course of trade of such a nature as to discredit the establishment, the goods or the industrial or commercial activities of a competitor; and indications or allegations the use of which in the course of trade is liable to mislead the public as to the characteristics of goods.
- 2) The protection against unfair competition supplements the protection of inventions, industrial designs, trademarks and geographical indications. It is particularly important for the protection of know-how, that is: technology or information which is not protected by a patent but which may be required in order to make the best use of a patented invention.
- 3) The TRIPS Agreement contains, in its Article 39, provisions on the protection of undisclosed information (trade secrets). In the course of ensuring effective protection against unfair competition as provided in Article 10<u>bis</u> of the Paris Convention, Members of the TRIPS Agreement are required to provide natural and legal persons the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices so long as such information:
- 4) is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;
- 5) has commercial value because it is secret; and
- 6) has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret.

#### II. DSCRIPTION

#### A. Patent Search

Searching and search reports are generated for different reasons. As a consequence, search reports, even those relating to identical subject matter, will look different depending on the type of search requested. In general, there are six different types of patent searches, these being:

#### B. Due diligence Search

A due diligence search is designed to capture all relevant documentation available to a diligent searcher at a defined date. The search seeks to answer the following question – faced with a problem and without hindsight what solutions were available at the priority date to help solve the problem? Or put another way: given a problem and surrounded by all relevant information what avenues would be worthwhile exploring in an attempt to solve that problem or, at the very least, be worth investigating further? Adue diligence search is designed to capture all relevant documentation available to a diligent searcher at a defined date. The purpose of such a search is therefore to uncover all of the related subject matter available to a skilled addressee and will not be restricted by particular solutions. The number of documents recovered is considerable as the searcher attempts to survey the whole of a technical field. A due diligence search attempts to provide a comprehensive inventory of the state of a particular art.Due diligence searches are often conducted in



relation to patent litigation matters, although such a search can also provide an important source of a company's market intelligence. A due diligence search will reveal data on existing competitors and any newentrants to a market. It will also find out what competitors are doing and where, and can be used as a tool for analyzing future trends and as a basis for making strategic commercial, build and buy decisions.

#### C. Patentability Search

A patentability search is designed to uncover any barriers that will prevent an invention being granted exclusive patent rights. The searcher will seek answers to the following questions: is the invention new and novel? Does the invention disclose an inventive step? Is the invention capable of industrial application? To be patentable an invention must be novel, it must be inventive and it must be useful. A patentability search is often seen as a first step in obtaining a patent. Apatent attorney will form an opinion of an invention based on the patentability search. A patentability search is also an extremely important early step in deciding whether to proceed with an idea. A patentability search will allow you to make considered decisions as to whether you should continue to explore your idea through the patent process. It may prevent you from spending a lot of money on further research, development, manufacture, protection, and marketing of an idea that has already been thought of and may already be being exploited by others without your knowledge and in markets that you are unaware of. As the old adage says "an ounce of prevention is worth a pound of cure". A patentability search is often conducted after filing a provisional patent application but before filing a complete patent application, as it can be used to identify the possible scope or limits of an invention and will assist your patent attorney to draft a robust patent application with maximum scope but within the bounds of validity.

#### D. Patent Infringement Search

To establish whether an infringement of a patent has taken place the patent owner must prove that the following has occurred: the infringer has carried out a prohibited act (i.e. made, used, sold or imported a patented product, or has used a patented process, or has made, used or sold a product made directly from a patented process); that the prohibited act has taken place in the country where the patent has been granted; that the prohibited act has occurred after publication of a granted patent; that the prohibited act falls within the scope of at least one claim of the granted patent. An infringement search is designed to ascertain all of the above and will result in a search of the patent database applicable to a particular product or process. A patent infringement search should be conducted by any individual or company wishing to export products overseas or before entering into any agreement to supply goods overseas. Patents are restricted by territory so you may be free to export to some countries in which no patent protection is in place, but not to other countries where a granted patent is in force. An infringement search is less involved than a due diligence or patentability search, as it is restricted only to existing patents that remain in force and which have not lapsed or expired. An infringement search will generally only involve a search of patent databases covering the last 20 years or so. Another useful and important aspect of an infringement search is that it will reveal those patents that are likely to be infringed and therefore provide an opportunity to design around them or to make subtle improvements on them. It is not uncommon for competitors of existing patent holders to avoid infringement by making similar products not covered by the patent claims.

#### E. Freedom to Operate Search

A freedom to operate search invariably involves a narrow subject area search and can be limited to perhaps three or four key words, one or two patent classes and one or two applicants or inventors. This search will ask questions about a specific, clearly defined product or process about which much is already known. Similar to a patent infringement search the main purpose of the search is to determine whether known technology is free to use. That is: is the technology covered by a patent? If so, where is it covered? and is that patent still in force?

#### F. Document Status Search

This type of search is often commissioned by companies wishing to make, use, import or sell generic goods, usually pharmaceuticals or base chemicals into a specific jurisdiction.

It is similar to a freedom to operate search, although in most cases it is more specific. For example, the patent is usually known, or specific subject matter such as the compound name is known. The search is often jurisdiction (country) dependent and will invariably be run several times over a number of years often as a watching service. This type of search will look at a specific compound or patent number, equivalent patents filed around the world and their present status.



A. Iteration:1

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## G. Product / Process Specifications Search

This search type is probably the narrowest of all of the searching types and may be commissioned by a company wishing to find out more about a specific technology. It is often used to answer a specific technology problem, the solution to which may be found in a single patent. Such a search can often lead to a license or cross license between like-minded companies. Patent Search is to determine the novelty, Inventiveness and industrial utility of the research disclosure. This search needs to be done rigorously in patent and non patent literature to find out if any prior art overlap exists or not. If prior art exists, then its non patentable else its patentable

#### H. Steps to conduct a patent search.

Summarize the invention in 100 words covering the novel key aspects alone.

Frame the key aspects from the keywords.

Perform an iterative combination of Key words such that the combination of novel key aspects is not present in any one patent or non patent document,

### III. NUMERICAL RESULTS

Database :Google Advanced Patent Search database Keywords used: Android, Malware ,security, trojan, virus, worm

Google Android, Malware ,security, trojan, virus, worm		Q			Sign in
Patents		Find prior art Discuss this patent	View PDF Downl	oad PDF	\$
Detecting <mark>malware</mark> on mobile devices based on mobile behavior analysis US 9479357 B1 ABSTRACT	Publication number Publication type Application number Publication date Filing date Priority date ⑦	US9479357 B1 Grant US 12/718,758 25 Oct 2016 5 Mar 2010 5 Mar 2010			
Applications running on a mobile device are monitored for suspicious actions utilizing mobile features of the mobile device. Once a suspicious action performed by an application is detected, that suspicious action is suspended. Information about the suspicious action and the application is collected and transmitted to a remote security system over a wireless network. The security system analyzes the suspicious action and the application to determine a	Inventors Original Assignee Export Citation Patent Citations (14), No Classifications (9), Lega	Jie Fu, Zhigang Kan, Gehua Huang, Yuan Yuan Li Symantec Corporation BiBTeX, EndNote, RefMan on-Patent Citations (2), Referenced by (1), I Events (1)			
security rating of the application, and transmit the security rating back to the mobile device. Whether the application is malware and whether the suspicious.	External Links: USPTC	), USPTO Assignment, Espacenet			

action should be allowed to continue are both determined based on the security rating.

Fig.1shows the search results ie the relevant patent prio art result of the novel keywords.



# Optimized resource allocation for virtual machines within a malware ...

www.google.co.in/patents/US9495180

Grant - Filed 10 May 2013 - Issued 15 Nov 2016 - Osman Abdoul Ismael - Fireeye, Inc. Embodiments of the disclosure relate to the field of data security. ... types of malware may include bots, computer viruses, worms, Trojan horses, ... Overview · Related · Discuss

# Hygiene based computer security

www.google.co.in/patents/US9262638 Grant - Filed 1 Nov 2012 - Issued 16 Feb 2016 - Carey S. Nachenberg - Symantec Corporation The security module evaluates the reputation score and optionally cancels ... Malware threats include computer viruses, worms, Trojan horse ... Overview - Related - Discuss

# New 2017 McAfee Antivirus | mcafee.com

McAfee.com/Security

Award-Winning Antivirus Software. Buy Today And Save Up To 50% Off.

# Detecting malware on mobile devices based on mobile behavior analysis

www.google.co.in/patents/US9479357

Grant - Filed 5 Mar 2010 - Issued 25 Oct 2016 - Jie Fu - Symantec Corporation The security system analyzes the suspicious action and the application ... Malware threats include computer viruses, worms, Trojan horse .... as Microsoft Windows Mobile, Apple iPhone OS, Google Android, and Palm WebOS.

#### Fig2: Google Advanced Patent window for the projected novel keywords

#### B. Database : Espacenet

Keywords used: Android, Malware, security, trojan, virus, worm Ieration1





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C. Output

Europäisches Patentamt European Patent Office Office européen des brevets	Espacenet Deutsch English Fra Patent search Change count	ançais ontact try <del>–</del>
44 About Espacenet Other EP	O online services	
Search Result list  🚖	My patents list (0) Query history Settings Help	
<u>Refine search</u> → Results		
Smart search		
Advanced search		Print
Classification search		-
Quick help → Can I subscribe to an RSS feed of the result list?	0 results found in the Worldwide database for: ((((ia = Android and ia = Malware) and txt = security) and txt = trojan) and txt = virus) and txt = worm using Smart search	
→ What does the RSS reader do with the result list? → Can I export my result list? → What happens if I click on "Download course"?		
<ul> <li>→ Why is the number of results sometimes only approximate?</li> <li>→ Why is the list limited to 500</li> </ul>		
	Fig3: Output of the Keywords	

1) Ieration2: Android, security, trojan, virus, worm

Europäisches Patentiamt Patent Office Office europäen des brevets	Espacenet         Deutsch         English           Patent search         Change	Français Contact country <del>-</del>						
44 About Espacenet Other EPO	4 About Espacenet Other EPO online services							
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Advanced search		D Print						
Classification search								
Quick help – – – – – – – – – – – – – – – – – – –	0 results found in the Worldwide database for: ((((ia – Android and ia – Matware) and txt – security) and txt – trojan) and txt – virus) and txt – worm using Smart search							
→ What does the RSS reader do with the result list?     → Can Lexport my result list?     What happens if Leick on _ Download covers'?     why the number of results sometimes only approximate? why is the list limited to 500								
	Fig4: Output of the Keywords							

2) Iteration3:Android, security, , virus, worm

Europäisches Patentamt Europan Patent Office Office européen des brevets	Espacenet Patent search Change c	Français Contact ountry ←
4 About Espacenet Other EP	O online services 🔻	
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Refine search → Results		
Smart search	Result list	
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Quick help	0 results found in the Worldwide database for: ((((ia = Android and ia = Malware) and txt = security) and txt = trojan) and txt = virus) and txt = worm using Smart search	
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	Fig4: Output of the Keywords	

![](_page_9_Picture_0.jpeg)

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		ECTION METHOD FOR TRA	CING DISTRIBUTO	RS OF MOBILE	MALWARE		
1.	BLACK MARKET COLL	ECTION METHOD FOR TRA					
*	Inventor: GO WOONG [KR] CHOI EUN YOUNG [KR] (+2)	Applicant: KOREA INTERNET & SECURITY AGENCY [KR]	CPC: H04L63/1416 H04L63/20	IPC: H04L29/06	Publicatio US201720 2017-07-1	on info: )1532 (A1) 3	Priority date: 2016-01-07
2.	Devices, Systems, and	Methods for Detecting Prox	imity-Based Mobile	e Malware Propa	gation		
*	Inventor: WANG WEI [US] XU GANG [US] (+1)	Applicant: AT & T IP I LP [US]	CPC: G06F21/00 G06F21/564 G06F2221/034 (+3)	IPC: G06F21/56 H04L29/06	Publicatio US201713 2017-05-1	on info: 34398 (A1) 1	Priority date: 2010-12-08
3.	Dynamic patching of m	ultiple, functionally equivale	ent variations of var	rious software me	odules for se	ecurity reas	ons
*	Inventor: ISLAM NAYEEM GUPTA RAJARSHI	Applicant: QUALCOMM INC	CPC: G06F21/51 G06F21/52 G06F21/55 (+4)	IPC: G06F21/55 G06F21/57 G06F9/445	Publicatio CN106462 2017-02-2	on info: 2429 (A) 2	Priority date: 2014-06-27
4.	Systems and methods	for pre-installation detection	n of <mark>malware</mark> on <mark>m</mark>	obile devices			
*	Inventor: XUE YONG LING	Applicant: SYMANTEC CORP	CPC: <u>G06F21/554</u> <u>G06F21/564</u> <u>G06F21/57</u> (+10)	IPC: G06F21/56 H04L29/06 H04L29/08 (+1)	Publicatio CN106415 2017-02-1	on info: 5584 (A) 5	Priority date: 2014-03-11
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		Fig5.	Output of the Key	words			
		Fig5:	Output of the Key	words			
an I	United States Patent	Fig5:	Output of the Key	vwords	US 9,479	9,357 B1	,
(12) U Ft	United States Patent Fu et al.	(10) Patent No.: US (45) Date of Patent:	Output of the Key 8 9,479,357 B1 Oct. 25, 2016	7Words 1 DETECTING MALWARI DEVICES BASED ON MOI ANALYSI BACKGROUZ	US 9,479 E ON MOBILE BILE BEHAVIOR S	9,357 B1 running on the mobile ing to access a mobil pending the suspicious collecting information application; transmit	2 device, the suspicious action a le feature of the mobile devic action performed by the appli about the suspicious action a in the collected information
(12) U Fi (54) D A (75) In	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAV ANALYSIS Inventors: Jie Fu, Chergdu (CN); Zhigan Beijing (CN); Gehan Huang, B	Fig5: (10) Patent No.: US (45) Date of Patent: (45) Date of Patent: (45) Date of Patent: (10) 2003/0223506 A1* 122403 Keem 2003/0233576 A1* 122404 Keem 2004/000376 A1* 122404 Keem 2004/000376 A1* 122404 Keem 2004/000376 A1* 122404 Keem 2004/000376 A1* 122404 Keem 2004/000377 A1* 122404 Keem 2004/000372 A1* 20204 Keem 2004/000377 Tavdd	Output of the Key <b>S 9,479,357 B1</b> Oct. 25, 2016 desev et al	1 DETECTING MALWARI DEVICES BASED ON MOI ANALYSE BACKGROUX 1. Field of Direlosure The disclosure generally relates security, in particular to detecting or cultous on mobile devices. 2. Description of the Related Ar A wide variety of malicions s	US 9,479 E ON MOBILE BELIAVIOR 5 ND 5 ND 5 ND 5 to the field of computer allicious software appli- t	9,357 B1 running on the mobile ing to access a mobil pending the suspicious collecting information emote computer three security rating of the work, the security rating linking whether the 1 security rating. Still another aspect	2 device, the suspicious action a le feanner of the mobile devic action performed by the appli- n abcot the suspicious action a sing the collected information application in the source of the application is and are measuremen- lead to be application in a madware based to of the present disclosure is
(12) U Fr (54) D D A (75) In (75) A	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jie Fu, Chergdu (CN); Zhigan, Beijing (CN); Gehua Huang, B (CN); Yuan Yuan Li, Chengdu Ansigace: Symantee Corporation, Mount	Fig5: (10) Patent No.: US (45) Date of Patent: (45) Date of Patent: (45) Date of Patent: (10) 2003/0229306 A1* 122/03 Koum 2003/023354 A1* 122/03 Koum 2004/003176 A1* 122/04 Koum 2004/003176 A1* 122/04 Koum 2004/003176 A1* 122/04 Koum 2004/003176 A1* 122/04 Koum (CN) 2007/024/088 A1* 9/2007 Guba 2007/024022 A1* 102/07 Towel 2008/006776 A1* 42/08 Towel 2010/0611432 A1* 112/01 Edve in 2010/0611432 A1* 112/01 Edve	Output of the Key <b>S 9,479,357 B1</b> Oct. 25, 2016 dsov et al	1 DETECTING MALWARI DEVICES BASED ON MOI ANALYSE BACKGROUX 1. Field of Direlosure The disclosure generally relates security on malicions of Avide variety of malicions of attack modern computers. Maharer A wide variety of malicions of attack modern computers. Maharer innes witche unot an other between the component of the Related Ar	US 9,479 E ON MOBILE SILE BELLAVIOR 5 ND 5 to the field of computer allicicus software appli- t forware (nalware) comvare (nalware) function are notification data	9,357 B1 running on the mobile ing to access a mobil pending the suspicious collecting information application, transmit remote computer the security rating of the work, the security rating. Still another aspect transitory computer or executive rating.	2 device, the suspicious action at le feature of the mobile devices saction performed by the appli- about the suspicious action a ing the ovincless network; recor- upplication through the wirele ting comprising a measuremen- ication for being molware; and application is malware based to of the present disclosure is u- oduble storage modium eacode organm code for detecting a mil-
(12) U F( (54) D D A (75) In (75) A (*) N	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jle Fu, Chergdu (CN): Zhigan Beijing (CN): Gehua Huang, B (CN): Yuan Yuan Li, Chengdu Assignce: Symantic Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted (CN): Chergh bert for theme	Fig5: (10) Patent No.: U: (45) Date of Patent: (45) Date of Patent: (45) Date of Patent: (10) 2003/0229301 A1* 122003 Keene 2003/023356 A1* 122003 Keene 2004/001704 A1* 122003 Keene 2004/001704 A1* 122004 Keene 2004/001704 A1* 12004 Keene 2004/001704 Keene 2004/001704 Keene 2004/001704 Keene 2004/001704 Keene 2004/001704 Keene 2004/001704 Keene 2	Output of the Key <b>S 9,479,357 B1</b> Oct. 25, 2016 etsov et al	1 DETECTING MALWARE DETECTING MALWARE DEVICES BASED ON MOI ANALYSIS BACKGROUZ 1. Field of Disclosure The disclosure generally relates security, in porticular to detecting a cations on mobile devices. 2. Description of the Related Ar A wide variety of malicious s tatck modem of phishing websites. times stack servers that store semi that can be used to the malicious Similarly, other computers, itenality be constantly protected from malici- tions stacks are computer.	US 9,479 E ON MOBILE SILE BELAVIOR S ND 5 to the field of computer nalicicous software appli- to oftware (nalware) can buildicous software) can there is include computer prans, spyware, advare, g borne computers, must ous software that can be uest with can be plante computers, must ous software that can be plante computers, must ous software that can be plante computers, must ous software that can be plante software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software software sof	9,357 B1 running on the mobile ing to access a mobil pending the suspicion collecting information application, transmitt remote computer the security rating of the work, the security rating in thicklowed of the appli- ing whether the : security rating. Still another aspect insuing, computer or executable computer or executable computer or performed by an appli- the suspicions action of the mobile device	2 device, the suspicious action a le feature of the mobile devic saction performed by the appl a bott the suspicious action a abott the suspicious action a application through the wireld ing comprising a measureme taction for being molware, an application is malware based t of the present disclosure is oabible storinge mediam encode wegaram code for detecting a san le dovice, the computer progra ode for detecting a suspicious iteration running on the mobile attempting the access a mobile factoric collection in furnational existing collecting information
(12) U Fr (54) D A (75) In (73) A (*) N (21) A	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jie Fu, Chengdu (CN); Zhigan Beijing (CN); Gehun Huang, B (CN); Yuan Yuan Li, Chengdu Assignce: Symantec Corporation, Mount View, CA (US) Notice: Subject to any dischimer, the re- patent is extended or adjusted i U.S.C. 154(b) by 1671 days. Appl. No: 12718,758	Fig5: (10) Patent No.: U: (45) Date of Patent: (45) Date of Pat	Output of the Key <b>S 9,479,357 B1</b> Oct. 25, 2016 etsov et al	1 DETECTING MAUNAR DETECTING MAUNAR DEVICES BASED ON MOI ANALYSIS BACKGROUZ 1. Field of Dischoure The discloware generally relates scorify, in particular to detecting a cations on mebile devices. 2. Description of the Related An A wide variety of malicious e- vitases, worms, Trajan horse peop eriservare, and plinhing webrides. Similarly, other computers, Malware vitases, worms, Trajan horse peop eriservare, and plinhing webrides. Similarly, other computers, includin be constantly protected from statis- tines and a servers that store semi that can be used to the realizious - binalerdy, other a user commu- regament plates, and in many other options and methods available to pathoe and methods available to	US 9,479 C ON MOBILE SILE BEHAVIOR S ND 5 to the field of computer milicious software appli- to of ware (nalware) can malicious onthis some 15 to of ware (nalware) can there in cube computer rans, spyware, adware, functor swith of there in the giorne computers, must ous software that can be giorne computers via 24 alucits with others via 24 alucits with others via 24 alucits via the different of multicious entities for	9,357 B1 running on the mobile ing to access a mobil pending the suspicious cellecting information explication, transmitt remote computer three security mining of the work, the security mining takelhood of the appl mining whether the : security rating. Still another aspect transiting computers re- executable computers executable computers performed by an appl the suspicious action of the mobile device collected informations actions the suspicious action collected informations less network; receiving less network; receiving	2 device, the suspicious action at le feature of the mobile device action performed by the appli- about the suspicious action a sing the collected information ing comprising a measurement leading on which any a measurement leading to be a sub- application is small as a measurement optication is small as a sub- soluble storage mediant encode expram code for edetecting a sus- picous icotion running on the mobile- ation particular is a sub- icotion collection in minimum and the applications in monimit to a sense computer fravoga- ga accurity ming of the appl- anced by and the appl-
(12) U Fr (54) D D A (75) In (75) In (73) A (*) N (21) A (22) F	United States Patent Pu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jie Fu, Chergdu (CN); Zhigan Beijing (CN): Gehan Huang, B (CN): Yuan Yuan Li, Chengdu Ansignee: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted i U.S.C. 154(b) by 1671 days. Appl. No.: 12718,758 Filed: Mar. 5, 2010	Fig5: (10) Patent No.: U: (45) Date of Patent: (45) Date of Patent: (45) Date of Patent: (45) Date of Patent: (10) 2003 023356 A1* 122005 Keem 2003 023357 A1* 122005 Keem 2004 001073 A1* 122005 Keem 2004 001073 A1* 12004 Keem 2007 021488 A1* 92004 Keem 2007 021488 A1* 92004 Keem 2007 021488 A1* 92004 Keem 2007 021488 A1* 92004 Keem 2007 021488 A1* 92016 Keem 2007 021488 A1* 92010 Keem 2007 02148 Keem	Output of the Key <b>5 9,479,357 B1</b> Oct. 25, 2016 dsov et al	1 DETECTING MALWARE DETECTING MALWARE DETECTING MALWARE DEVICES BASED ON MOI ANALYSIS BACKGROUP 1. Field of Direlstur 2. Description of the Related An A wide variety of malcious - stack modem computers. Malware viruses, worms, Trajan horse prog attack modem computers, includin A wide variety of malcious - similarly, other computers, includin that can be used to the malicious similarly, other computers, includin that can be used to the malicious similarly, other computers, includin that can be used to the malicious similarly, other computers, includin that can be used to the malicious similarly, other computers, includin that can be used to the malicious similarly, other computers, includin the output the malicious of many other and the malicious of the malo computers, when as ignatu	US 9,479 E ON MOBILE STEE BEHAVIOR S ND 5 to the field of computer nalicious software appli- to dfware (mslware) can there include computer rams, spyware, advare, g home completers, must with others via 2 g home completers, must com software that can be uicates with others via 2 g home computers, must restor, security of the software of the softwar	9,357 B1 running on the mobile ing to access a mobil pending the suspicion collecting information evolution of the appl intermole computer the security rating of the work, the security rati- security rating. Bill another aspect encortained and the appl intermole computer or executable computer or executable computer or executable computer or executable computer or executable computer or performed by an appl the suspicions action of the mobile devices performed by the app the suspicions action collected information bars network; receiving through the wireless n a mainvace, and determin	2 device, the suspicious action at le feature of the mehie device saction performed by the appli a about the suspicious action a hour the suspicious action a updication through the wirele ting comprising a measuremen- ication for being molware; and application is malware based to fibe present disclosure is obable storage modium encode segaram code for detecting a suspic- loss disclosure and the sub- disclosure and the sub- disclosure and the sub- ing and the supplication is naised by the sub- disclosure and the sub- le device, the computer program dote for detecting a sub- tient or that the sub- stance of the sub- tient of the present disclosure is a security meting of the appli- twork, the security ming com- letibaced of the application for any whether the applications for any or any or any or any or any or any o
(12) U Fr (34) D A (75) Ic (75) Ic (75) A (*) N (21) A (22) Fr (31) In H	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jie Fu, Chengdu (CN); Zhigan, Beijing (CN); Gehua Huang, B (CN); Yuan Yuan Li, Chengdu Ansigace: Symantec Corporation, Mount View, CA (US) Notice: Subject to any dischimer, the ter patent is extended or adjusted i U.S.C. 154(b) by 1671 days. Appl. No: 12718,758 Filed: Mar. 5, 2010 Int. Cl. H94L 2950 (2006.01) H94L 1258 (2006.01) H94L 1258 (2006.01)	Fig5:           (10) Patent No.: U:           (45) Date of Patent:           2003/023956         122303         Korm           2003/023956         122303         Korm           2003/023956         122303         Korm           2003/023956         12304         Korm           2004/003276         12404         Korm           2004/003272         12404         Korm           2007/02/21488         Alf         9/2007         Galf           2010/01/132         12404 <t< td=""><td>Output of the Key <b>S 9,479,357 B1</b> Oct. 25, 2016 etsov et al</td><td>1 DETECTING MAUNAR DETECTING MAUNAR DETECTING MAUNAR DETECTING MAUNAR BACKGROU BACKGROU 1. Field of Disclosure The disclosure generally relates scenity, in porticular to detecting a cation on mebie devices. 2. Description of the Related An A wide variety of malicious s stack modern computers. Malware viness, woms, Trojan horse prog crimerware, and plaining webriks.) 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Field of Disclosure The disclosure generally relates scenity, in porticular to detecting a cation on mebie devices. 2. Description of the Related An A wide variety of malicious s stack modern computers. Malware viness, woms, Trojan horse prog crimerware, and plaining webriks.) Similarly, other computers, includin be constantly protected from audii that and he used to the malicious o- stitack modern computers, includin be constantly protected from audii be constantly protected from audies than and he as user commune centrotic mail, when a user down constantional techniques for descet devices such as mobile phases. Be spicelly have timised computing manding malware detection tech	US 9,479 CON MOBILE SILE BEHAVIOR CON MOBILE SILE BEHAVIOR CONTRACTOR CONTRAC	9,357 B1 running on the mobile ing to access a mobile collecting information epileations, transmitt remote computer three security miting of the work, the security mit likelihood of the appl mining whether the : security raning. 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12) U Ft 54) D D A 75) Iz 73) A *) N 21) A 22) Ff 51) In <i>HH</i> <i>HH</i> <i>H</i> <i>H</i> <i>S</i> 22) U C	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jle Fu, Chergdu (CN); Zhigan Beijing (CN); Gehna Huang, B (CN); Yuan Yuan Li, Chengdu Assignce: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted : U.S.C. 154(b) by 1671 days. Appl. No.: 127118,758 Filed: Mar. 5, 2019 Int. Cl. H941. 2258 (2006.01) H942. 2900 (2006.01) H942. 2900 (2006.01) US, Cl. CPC H942. I22585 (2013.01); H94 (2013.01); H942. 5125 (2013.01); H94	Fig5:           (10) Patent No.: U: (45) Date of Patent:           (10) Patent No.: U: (2003 023356 A1* 122005 Keem 2004 001070 A1* 122005 Keem 2004 001070 A1* 122005 Keem 2004 001070 A1* 122005 Keem 2007 024022 A1* 122001 Keem 2007 024022 A1* 122001 Keem 2005 00102 A1* 122001 Keem 2005 00102 A1* 122001 Keem 2005 00102 A1* 122001 Keem 2001 02005 A1* 12001 Keem 2001 02005 A1* 12001 Keem 2001 02005 A1* 12001 Kee	Output of the Key S 9,479,357 B1 Oct. 25, 2016  stov et al	1 DETECTING MAUNAR DETECTING MAUNAR DETECTING MAUNAR BUTCES BASED ON MOI ANALYSIS BACKGROUP 1. Field of Direbsure The direbsare generally relates scenity, in periodular to detecting a cation on meltic device. 2. Description of the Related Ar A wide variety of malicions - stack modern outputers. Mahware viruses, worms, Trojan hore prog with the output of the related Ar A wide variety of malicions - stack modern computers. Mahware viruses, worms, Trojan hore prog virusers, words, start or enables that on be used to the malicions start on the set of the malicions similarly, other computers, includin to constantly protected from malici transmitted when a user down program updates, and in many other opticate on a computer set maney other optices used as mobile phones. Be tyricely have limited computing anding malware detection tech viscos. Stimitarly, because of the opticities of descent malows.	US 9,479 CON MOBILE STREEBERAVIOR STREEBERAV	9,357 B1 running on the mobile ing to access a mobil pending the suspicion optication, transmit remote computer thro security ming of the work, the security ming bicklihood of the appl ining whether the : security ming. Still another aspect instingy computer or security ming. Still another aspect instingy computer or security ming. Still another aspect tensitivy computer or security ming. The former and another performed by an appl the suspicions action less network; receivin through the wireless in a malware, and determin ware based on the sec The features and ad- are not all inclusive features and ad- are not all inclusive security ming.	2 device, the suspicious action a le feature of the mobile devic saction performed by the appl a hoet the suspicious action to about the suspicious action to application through the wirele ting comprising a measurement ing comprising a measurement ing comprising a measurement ing comprising a measurement device, the computer progra- double storage modium encod every an order for detecting a nut double storage modium encod every and the suspicious circinon running on the mobile attempting to access a mobile cristion running on the mobile attempting to access a mobile cristion, running on the mobile attempting to access a mobile cristion, the application to ming whether the applications further of the application of height double the applications and the application transmit hing whether the applications the application the applications and in a particular, many add is will be appearent to one of or a feature application of the applica- tional the transping velocited head the total that the language to about principally selected b all purposes, and may not har or eicennecelber the disclosure
(12) U Fi (54) D D A (75) le (75)	United States Patent Fu et al. DETECTING MALWARE ON MOBILE BEVICES BASED ON MOBILE BEHAY ANALYSIS Inventors: Jle Fu, Chengdu (CN); Zhigan, Beijing (CN); Gehan Huang, B (CN); Yuan Yuan Li, Chengdu Ansigace: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted i U.S.C. 154(b) by 1671 days. Appl. No.: 12718,758 Filed: Mar. 5, 2010 Int. CL. H041.2288 (2006.01) H042.2900 (2006.01) H042.2900 (2006.01) H042.2900 (2006.01) H042.2900 (2006.01) H042.2900 (2006.01) U.S. CL CPC	Fig5:           (10) Patent No.: US           (45) Date of Patent:           (20300229301 A1* 122003 Kown 2030023356 A1* 122003 Kown 2030023356 A1* 122003 Kown 204000170 A1* 129004 Kown 204000170 A1* 129004 Kown 204000170 A1* 129004 Kown 204000170 A1* 129004 Kown 204000170 A1* 12900 Kown 204000170 A1* 12900 Kown 204000170 A1* 12900 Kown 2007021498 A1* 92004 Kown 2007021498 A1* 92004 Kown 2007021492 A1* 12900 Edwy 2017021498 A1* 92004 Kown 2008008076 A1* 42008 Towell 20100801402 A1* 12900 Edwy 20110154400 A1* 62011 Dalae           official Statement 2010080142 A1* 12900 Edwy 20110154400 A1* 62011 Dalae           Other PUBLICA 2010080142 A1* 12900 Edwy 20110154400 A1* 62011 Dalae           other PUBLICA 20110 Edwy examiner           Privary Examiner           Applications running on a mobile de device. 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(12) U Fr (54) D A (75) Ir (73) A (*) N (*) N (21) A (22) Fr (51) Ir H H H H H H (52) U C C (58) Fr (58) Fr (58) C (58) C	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jle Fu, Chengdu (CN): Zhigan Beijing (CN); Gehna Huang, B (CN); Yuan Yuan Li, Chengdu Ansigace: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted (U.S.C. 154(b) by 1671 days. Appl. No.: 12718,758 Filed: Mar. 5, 2010 Int. CI, H041.29800 (2006.01) H041.29800 (2006.01) H041.29800 (2006.01) US, C1 CPC	Fig5:           (10) Patent No.: U: (45) Date of Patent:           (10) Patent No.: U: (45) Date of Patent:           (2003/0229301 A1* 122003 Keem 2003/0233766 A1* 122003 Keem 2003/023376 A1* 122003 Keem 2004/001703 A1* 12906 Keem 2007/021498 A1* 92106 Keem 2007/021498 A1* 92106 Keem 2007/021492 A1* 12010 Keem 2001/02102 A1* 12010 Keem 2001/0210 Keem 2001/021410 A1* 62011 Delse 3000/0214 A1* 62011 Delse 3000/0214 A1* 62011 Delse 3001/0211 Retireved from the Internat-CI Mobile Devices." 2008, pp. 1-5. [Odia 2011] Retireved from the Internat-CI Mobile Devices." 2008, pp. 1-5. [Odia 2011] Retireved from the Internat-CI Mobile Devices." 2008, pp. 1-5. [Odia 2011] Retireved from the Internat-CI edv(fj:groupplate/innab/cittl#:mobilector * cited by examiner Privery Examiner Privery Examiner - Fri (57) ABSTRACT Applications running on a mobile device. (51) ABSTRACT Applications running on a mobile device. (51) ABSTRACT Applications running on a mobile device. (51) ABSTRACT Applications running on a mobile device. (53) ABSTRACT Applications running on a mobile device. (54) Autorney: Agent, or Firm - Fitter (55) ABSTRACT Applications running on a mobile device. (55) ABSTRACT Applications running on a mobile device. (57) ABSTRACT Applications running on a mobile device. (58) AC on an the application to runnes about the runpic/outs action runnes of the application to a remot wireless setwork. 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Moreover, if al in the specification in ability and instruction selected to delineat of matter.</li> <li>BRIEF DESC Figure (FIG. 11 is a ping- personal bacessure.</li> </ul>	2 device, the suspicious action a le feature of the mehile devic saction performed by the appl a hort the supplicions action a hort the supplications action a ting the eollected information quark and the subsection of the application through the wirele ting comprising a measurement ication for being melkane; an application is malware based to the present disclosure is soluble storage medium encode segum code for detecting a nucleotic engine code for detecting a supplica- tion is malware based to disble storage medium encode segum code for detecting a supplica- tion training on the mebile attempting to access a mobile etc.; suspending on the mebile attempting to access a mobile etc.; suspending on the mebile attempting to access a mobile etc.; suspending of the applications to a security ming com leafthood of the applications to any metage secrithed in the speci- and, in particular, many add is will be appearent to one of or a of the drawings, specification hould be noted that the langen subsen principally selected for all princes, and may not have or encommerche the disclosed CRIPTION OF DRAWINGS high-level block diagram of according to one embodiment
(12) U Fr (54) D D A (75) L (75) L (75) A (*) N (21) A (*) N (21) A (22) FI (51) III H H (52) U (53) C (55) C (55)	United States Patent Pu et al. DETECTING MALWARE ON MOBILE BEVICES BASED ON MOBILE BEHAY ANALYSIS Inventors: Jie Fu, Chengdu (CN); Zhigan, Beijing (CN); Gehan Huang, B (CN); Yuan Yuan Li, Chengdu Ansignee: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted 1 U.S.C. 154(b) by 1671 days. Appl. No.: 12718,758 Filed: Mar. 5, 2010 Int. CL H04L 25900 (2006.01) H04L 2906 (2005.01) (C13.01); H04L 51/38 (2013.01) (2013.01); H04L 12585; H04 H04L 630227; H04L 63/1491; H0 USPC	Fig5:           (10) Patent No.:         UK           (45) Date of Patent:         UK           (45) Date of Patent:         UK           (10) Patent No.:         UK           (10) Patent No.:         UK           (10) Patent No.:         UK           (11) Date of Patent:         UK           (12) Date of Patent:         UK           (11) Date of Patent:         UK           (12) Date of Patent:         UK           (13) Date of Patent:         UK           (14) Date of Patent:         UK           (15) Date of Patent:         UK           (16) Date of Patent:         UK           (16) Date of Patent:         UK           (17) Date of Patent:         UK	Output of the Key S 9,479,357 B1 Oct. 25, 2016 dsov et al	1 DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTING MAMNARI DETECTION OF MAMNARI DETECTION OF MAMNARI DETECTION OF MANARIA STACKGROUT The disconse generally relates to a second the detection of the disconse on mathematication of the disconse on mathematication of the Related AR A whice wardery of mathicines as that model on computers. Mahnari viruser, woms, Trajan horse prog or mathematication of the Related AR A whice wardery of mathicines that and he used to the mathicin that can be used to the mathicin the computers, makan the computers,	US 9,479 CON MOBILE SITE BELLAVIOR S ND S to the field of computer anlicicous software appli- t offware (malware) can harring anyware, advane, thereis include computer rams, spyware, advane, thereis include computer the spyware on mobile thereis include computer the resource limitations, teatt on mobile devices, teat on teat on teat teat on the teat on teat teat on teat teat on	9,357 B1 running on the mobile ing to access a mubil pending the suspiciou collecting information application; transmit security rating of the security rating of the performed by the app the suspicious action of the mobile device of the mobile device to a measurement of a li- nutware; and determi- ware based on the sec- The features and a ratio all inclusive security rating environments security ratio security ratio actions security ratio security ratio	2 device, the suspicious action a le feature of the mobile device action performed by the appli- about the suspicious action a ring the edilected information application through the wirele ing comprising a measureme- ication for being molware; and application is malware based to the present disclosure is outside storage median encode organs code for detecting a suspicous information of the suspications information of the suspications information of the suspications factor for detecting a suspicous factor for, detecting a suspicous factor numing on the mobile attempting to access a mobile e; suspending to access a mobile e; suspending the suspicious factorion running of the appli- etation running of the appli- etation in the application in and the application; transmith to a sense computer through g a security ming of the appli- etation, the security ming com facility of the application in particular, many add is will be appeared to use of on a of the drawings, specification build be noted that the language to been principally isleted for al purporose, and may not have or circumserise the disclosed CRIPTION OF DRAWINGS high-level block diagram of theored in the subsciences index to use in the computing en- larced in the subsciences of the second principal to use on the disclosed corollage to one embediment level block diagram illustration are block diagram illustration and and the processing to one embediment and the one subsciences of the subsciences of the subsciences of the subsciences of the subsciences of the south the subsciences of the sub
(12) U F( (34) D A (75) Iz (75) Iz	United States Patent Fu et al. DETECTING MALWARE ON MOBILE DEVICES BASED ON MOBILE BEHAN ANALYSIS Inventors: Jle Fu, Chengdu (CN): Zhigan, Beijing (CN): Gehua Huang, B (CN): Yuan Yuan Li, Chengdu Ansignee: Symantec Corporation, Mount View, CA (US) Notice: Subject to any disclaimer, the ter patent is extended or adjusted i U.S.C. 154(b) by 1671 days. Appl. No.: 12718,758 Filed: Mar. 5, 2010 Int. CL H04L 29:00 (2006.01) H04L 12585 (1004.01) H04L 22585 (1004.01) US; CL CPC	Fig5:         (10) Patent No.: U:         (45) Date of Patent:         (10) COR       2003/0229301 A1* 122003 Keem         (10) COR       2003/0229301 A1* 122003 Keem         (10) COR       2003/0229306 A1* 122003 Keem         (11) COR       2003/0229301 A1* 12004 Keem         (12) COR       2003/0229302 A1* 12004 Keem         (12) COR       2004/0022942 A1* 12004/07 Tavel         2001/001212 A1* 12004 Keem       2004/0022942 A1* 12004/07 Tavel         2001/001212 A1* 12004 Keem       2004/0022942 A1* 12004/07 Tavel         2001/001212 A1* 12004 Keem       2004/0022942 A1* 12004/07 Tavel         2001/00121 A1* 12004 Keem       2004/0022942 A1* 12004/07 Tavel         2001/00121 A1* 12004 Keem       2004/002942 A1* 12004/07 Tavel         2001/00121 A1* 12004 Keem       2004/002942 A1* 12004/07 Tavel         OTHER PUBLICA         Obshile Devices, 2008, pp. 1-5, [0016         2011] Retrieved from the latenar/Glo       2011         (57)       ABS	Output of the Key S 9,479,357 B1 Oct. 25, 2016 store et al	1 DETECTING MAUNAR DETECTING MAUNAR DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTION DETECTI	US 9,479 CON MOBILE STREEBERAVIOR CON MOBILE STREEBERAVIOR	<ul> <li>2,557 B1</li> <li>running on the mobile ing to access a mobile pending the suspicion collecting information security rating of the work, the security rating intermediate of the appli- ning whether the is- security rating.</li> <li>Still another aspect executable computer or executable computer or executable computer or performed by the app- the suspicions action of the mobile device performed by the app- the suspicions action of the mobile device performed by the app- the suspicions action less network; receiving through the vireless as a measurement of a fi malwave; and determiny ware based on the sec The features and ad are not all inclusive is in the specification the ability and instruction set.</li> <li>BRIEF DESR Strates and advection and the art in vice classion. Moreover, it is a putting environment a putting environment a specification in a bability and instruction set.</li> <li>BRIEF DESR Strates and advection and the art in vice classion. Biotecher and an are not all inclusive in the specification in ability and instruction set.</li> <li>BRIEF DESR Strates and advecting and the art in vice classion. Biotecher and advecting and the specification in ability and instruction and the specification in the ability and instruction and the specification in ability and instruction and the specification in the ability and instruction and the specification in ability and instruction and the specification in ability and instruction ability and instruction</li></ul>	2 device, the suspicious action a le feature of the mobile devic action performed by the appli- nabout the suspicious action : ing the oclidented information of the oclidented information of the oclidented information ing comprising a measurement leading to be application in smallware based of the present disclosure is obable storage modiant encod vergama code for device and an le device, the computer progra order for device and anno- le device, the computer progra- ofe for device and anno- le device, the computer progra- de for device and anno- le device, the security miling cor- lication; collecting information and the applications; immunities of the drawing of the app- etwork, the security miling cor- lication of the applications in any whether the applications and, in particular, many and se will be apparent to one of or or of the drawings, specification and the applications and the applica- tion of the drawings, specification and be noted that the language of whether the disclosed CRIPTION OF DRAWINGS high-level block diagram illustrate of the computing to one embodiment level block diagram illustrate of the drawings in the order disclosed of block diagram illustrating and the according to one embodiment

![](_page_10_Picture_0.jpeg)

SL.NO	PARAMTERS	GOOGLE ADVANCED PATENT SEARCH	ESPACENET
1	Keyword strategy	Easier and Max no of keywords for better prior arts	Complex and Minimum no. of keywords
2	Operators	Not Required but only in rare cases	Required and Mandatory for quicker results
3	Iterations	Less required	More no. of iterations required
4	Prior art references	More	Less
5	Compatibility	Claims, description, abstract, drawings, reference, IPC/CPC codes in one window	Claims, description, abstract, mosiacs in separate window
6	In-house tools	Google Patents, Google Prior art finder	No such tools
7	Update of patent applications	Published, Pending, Grant from patent office are indexed to higher extent in google advanced patent search	Published, Pending, Grant from patent office are indexed to lesser extent in Espacenet.

#### IV. CONCLUSIONS

From the above results, it clearly shows that Google advanced patent search optimizes the iterations and gives instant prior art result whereas espacenet takes more iterations and refining of keywords are necessary such that it gives relevant prior art result. Its not only the result but also the keyword covers the concept correctly. Hence Google Advanced Patent search is better database than Esapcenet.

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![](_page_11_Picture_0.jpeg)

![](_page_11_Picture_1.jpeg)

![](_page_11_Picture_2.jpeg)

![](_page_11_Picture_3.jpeg)

![](_page_11_Picture_4.jpeg)

45.98

![](_page_11_Picture_6.jpeg)

IMPACT FACTOR: 7.129

![](_page_11_Picture_8.jpeg)

![](_page_11_Picture_9.jpeg)

![](_page_11_Picture_10.jpeg)

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