

## **Who protects what? - Latest developments in the field of testing**

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### **Abstract**

The development of a new technology often involves new ideas which can be protected by patent protection. Such new ideas however, may not always be commercially used outside private or research environments. Third party patents may provide strong obstacles causing serious problems at a later stage. Such obstacles are, for example staying of the production, payments of damages, long and costly litigation proceedings. Advanced search strategies will be shown to identify and interpret relevant patents. An example for such search strategies will be given for patents in the field of testing. Publically available patent literature can be used to learn about competitors technological strategies, such as new testing methods or new instruments for testing. The difference between a patent application and a granted patent will be explained and new players in the field may be identified at a very early stage by a suitable monitoring strategy.

### **Motivation**

Art. 65 Sec.1 of the European Patent Convention<sup>3</sup> states: *A European patent shall...confer on its proprietor ... the same rights as would be conferred by a national patent granted in that state.* In other words: The European patent has the same effect as a German patent. The question is: what is national law? In Germany, German Patent Act “Patentgesetz” applies. Of course, there are similar laws in most other countries of the world. §9 German Patent Act<sup>2</sup> says: *A patent shall have the effect that the patentee alone shall be authorized to use the patented invention.* Whoever has a patent for an invention is the only one who is allowed to use it in commerce. This means, that at present every business must consider patents in their technological field. There is no excuse not to get involved with patents even if patents are considered expensive or unnecessary. If a patent has been granted it must be respected.

## Claims

But what exactly is patented? This is, again, well defined in the national patent act, such as §14 German Patent Act: *The extent of the protection conferred by a patent... shall be determined by the terms of the claims.* In other words: the claims are the answer to the question: What is protected? A small discussion of the contents of a patent specification is necessary to understand the nature of patent claims. A patent specification comprises a description, claims and drawings. The description first explains the technical field. The people concerned with the patent will learn which technological field is concerned. This can be bicycles, engines, chemical fields or testing environments. A brief discussion of the prior art follows. Contrary to scientific publications the only the closest prior art documents must be mentioned rather than a lengthy discussion of the entire technical field. Only then the invention is disclosed. The general object of the invention is defined in the light of the prior art. What problems arise with known methods and devices? Which of such problems shall be solved with the present invention? The object is part of the invention. This makes sense since many solutions are simple once the problem has been detected. Of course, the solution of the problem is disclosed in this section also. Not only the inventive features are mentioned, but also their advantage over the prior art methods and devices. If there are advantageous modifications, they are also discussed. Finally, a brief description of the drawings is given and one or more embodiments are described in great detail. Many readers may think: “How can such a detail be protected” when reading well known details of an invention. However, the description of the embodiments will not define the scope of the protection but merely enable the person skilled in the art to carry out the invention. Only such ideas can be patented which actually work and can be described in a way that the person skilled in the art will know all necessary details to perform the idea. Even if there is no prototype of the invention it is often possible to produce suitable drawings or disclose the relevant steps which must be taken.

Claims are the most important part of the patent specification. They define the scope of protection and care must be taken when drafting the claim to use correct wording. It is easy to understand that “glueing” or “screwing” is more specific than “fixing”. Therefore, it is advantageous to use the broader term “fixing” rather than “screwing” to avoid that a device with “glueing” is not protected. A good claim uses many broad terms covering all possible alternatives of the invention. This, however, makes it difficult to understand the contents of the claim. It is, what often is called “patent language”.

A patent professional will look at the independent claims of a patent and can tell usually in very short time if the patent is relevant or not. If features are claimed which are not relevant for a business the



patent must not be considered at all. For example: A testing device uses X-ray for examining certain components of a plane. The claim comprises the feature “Testing device, comprising an X-ray radiation source...”. The manufacturer of devices only having UV-light sources will not need to consider the patent because the claims only relate to X-ray technology. A different situation may arise if the patent claims “Testing device, comprising a radiation source...”. This broad protection, however, may be difficult to achieve.

### **Examination and Granting of a Patent Application**

Patents will only be granted after substantive examination. A skilled examiner will read the patent, carry out a search and inform the applicant about further prior art documents which are relevant to the claim. Very often, the claim is too broad and must be amended to a limited scope of protection if the prior art anticipates parts of the claim. A patent may still be valuable to the patentee, even with such limitations.

An example may be the European Patent EP 1 364 203 B1 which has been granted on 9. February 2011 for Lockheed Martin Corporation “Remote Laser Beam Delivery System and Method for use for Ultrasonic Testing purposes”. The applicant initially claimed *A Gantry positioning and laser ultrasonic testing system with an integral laser beam delivery system,... comprising a remote laser source for emitting said laser beam, said laser beam being inserted into a first gantry member’s optical transmission channel and exiting through an end gantry member’s optical transmission channel; a plurality of mirrors ....* This information can be found on the Publication of the European Patent Application, which has the suffix “A..” after the Publication number.

The examiner has carried out a search and found a plurality of documents with the publication numbers WO-A-00/00783, WO-A-86/00557, WO-A-95/03526, US-A- 4 659 902 and US-A- 4 817 016. Such publication numbers can be found on the first page of the published patent specification which has the suffix “B..” after the Publication number (see Fig.1). The applicant has amended the claim to overcome the examiners objections. What was granted was the following claim: *A Gantry positioning operably coupled to a laser ultrasonic testing system and having an integral laser beam delivery system, comprising: a gantry positioning system ...comprising: a remote laser source for emitting said laser beam, such that said laser beam is inserted into a first gantry member’s optical transmission channel and exits through an end gantry member’s optical transmission channel; a plurality of mirror actuators for controlling the angular alignment of a plurality of mirrors .....*

(19)		
		(11) <b>EP 1 364 203 B1</b>
(12)	<b>EUROPEAN PATENT SPECIFICATION</b>	
(45) Date of publication and mention of the grant of the patent: 09.02.2011 Bulletin 2011/06	(51) Int. Cl.: <b>G01N 2924 (2006.01)</b>	
(21) Application number: 01999172.8	(86) International application number: PCT/US2001/049281	
(22) Date of filing: 19.12.2001	(87) International publication number: WO 2002/063607 (15.08.2002 Gazette 2002/33)	
(54) <b>REMOTE LASER BEAM DELIVERY SYSTEM AND METHOD FOR USE FOR ULTRASONIC TESTING PURPOSES</b> VERFAHREN UND VORRICHTUNG ZUR FERNVERTEILUNG EINES LASERSTRAHLS BEI DER ULTRASCHALLPRÜFUNG SYSTEME PERMETTANT L'EMISSION D'UN FAISCEAU LASER A DISTANCE ET PROCEDE D'UTILISATION AVEC UN SYSTEME DE POSITIONNEMENT A PORTIQUE POUR CONTROLES PAR ULTRASONS		
(84) Designated Contracting States: DE ES FR GB	(74) Representative: <b>Kay, Ross Marcel et al</b> Laudens Blackwell House Guildhall Yard London EC2V 5AE (GB)	
(30) Priority: 19.01.2001 US 766085	(56) References cited: WO-A-00/00783 WO-A-86/00557 WO-A-95/03526 US-A- 4 659 902 US-A- 4 817 016	
(43) Date of publication of application: 26.11.2003 Bulletin 2003/48		
(73) Proprietor: <b>Lockheed Martin Corporation</b> Bethesda, MD 20817 (US)		
(72) Inventor: <b>DRAKE, Thomas, E., Jr.</b> Forth Worth, TX 76110 (US)		

EP 1 364 203 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

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Fig.1 First Page of EP 1 364 203 B1

It is, therefore, vital to check out not only what was claimed initially, but also what claim has been granted by the patent office. Only claims which are new and involve an inventive step will be granted by the Patent Offices anywhere in the world.

## Searching Targets<sup>1</sup>

There are different kinds of searches with different results.

A novelty search serves to find out if an invention is new and possibly patentable. Such a search will not be concerned with the scope of protection of a patent publication and it is not relevant if the patent is still alive. The search will consider the entire disclosure of the publication and publications from all countries will have to be taken into account. In other words: a gardening journal in New South Wales is – theoretically – just as relevant as an active European Patent. This means that the entire disclosure of inactive foreign patents are also relevant.

A “freedom to operate” search (FTO) serves to find out which patents must be respected to avoid patent infringement. Such a search must be carried out before getting involved with new technical developments. Only such patents must be considered which are (still) active in the countries where the business shall be made and only the scope of the claims must be considered. In other words: all patent publications filed before more than 20 years, all utility models filed before more than 10 years (Germany) and all patent publications filed in countries where no business is done can be neglected right from the start. This reduces the amount of patents to be considered considerably.

Monitoring serves to continuously monitor current patent literature in order to avoid infringement and develop unnecessary, already known technologies.

### Carrying out a Search

There are many websites in the internet providing patent information. The present details can be found on the website of the German Patent and Trademark Office (DPMA):

[www.depatistnet.de](http://www.depatistnet.de)

which is available in English language also (click “English” in Menu on the very top in the right corner). The landing page is shown in Figure 2.

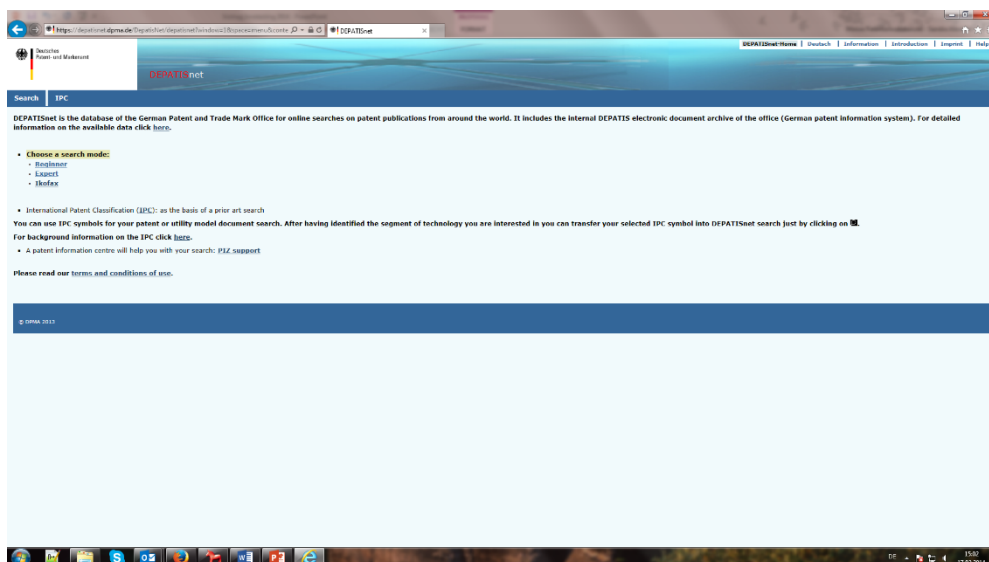


Fig. 2 Starting page of [www.depatistnet.de](http://www.depatistnet.de)

A beginner's search provides a comfortable menu which is shown in Figure 3 if a certain patent is searched for or if a list of patents of a particular inventor or applicant is searched for.

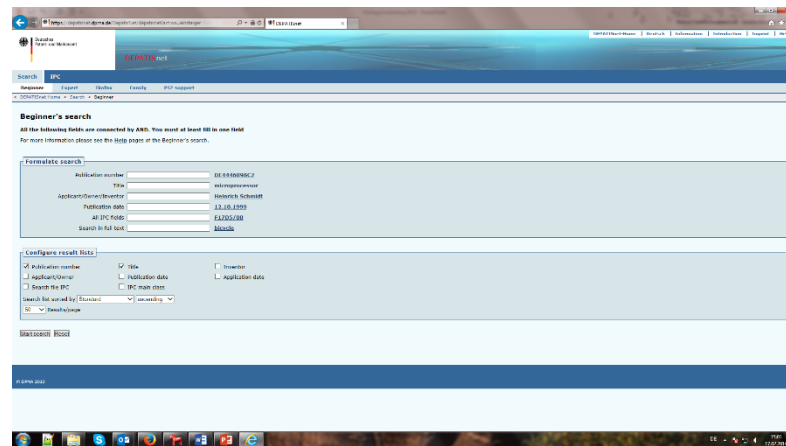


Fig.3 Menu of Beginner's search

For more complex searches, such as novelty searches, FTO or monitoring the Expert search must be used. The expert search provides a free text field where a search text can be entered. Fig.4 shows the empty field of the expert search.

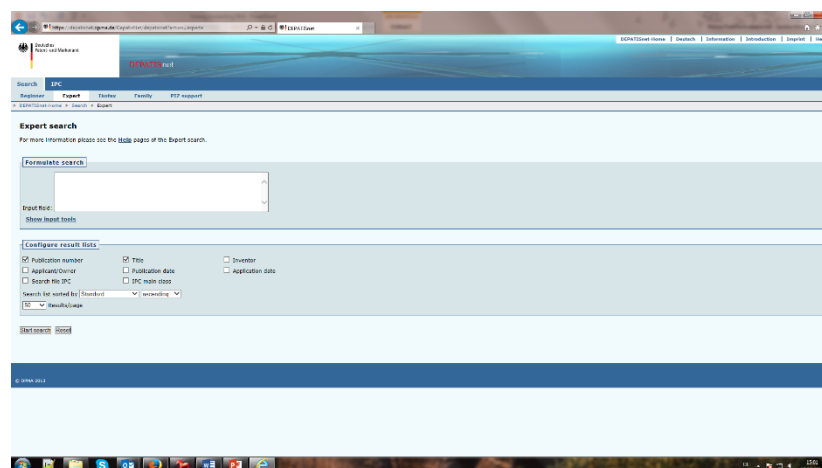


Fig. 4 Expert search

The present search shall relate to the initial question “Who protects what? - Latest developments in the field of testing”. This means, that we are only interested in young patent publications, for example Publications from the time after the year 2010. The relevant input tool can be taken from the list provided below the free text field. Here we chose the publication year which is coded with “PY”. Obviously, any other date, such as publication date “PUB” or the like can also be chosen, if this suits

better to the search target. The operator for “later than” is “>”. In the present example the start of the search reads:

PY>2010

The present question is targeted to certain countries. Here we chose USA, Germany and Europe as suitable geographic regions. We chose country of publication “PC”, but country of application “AC” would lead to similar results. The search now reads:

PY>2010 UND (PC=DE ODER PC=EP ODER PC=US)

“ODER” is the operator “or” and “UND” designates the operator “and”.

Somehow, the technological field must be defined. Such definition is effected by means of patent classes. There are about 200.000 Patents and utility models active with the German Patent and Trademark Office and each year more than 70 000 patents and utility models are applied for. It is, therefore, vital to find the exact patent class for the relevant technological field. One option is to check all classes and select the suitable classes. Another, much easier way is to use a list of well known inventors and applicants who are active in the interesting field of, for example, testing. Checking the audience of the Innotesting 2014 there are numerous inventors, such as Edmund Ahlers, Marc Kreuzbruck, Günter Albrecht, Uwe Pfeifer, Berend van der Wall, Joseph D. Brostmeyer, Joachim Schöffner, Robert Klöpffer, Thomas Heckel. Inserting such inventors will lead to

PY > 2010 UND (PC= DE ODER PC= EP ODER PC=US) UND ((IN = Edmund UND In = Ahlers) ODER ( IN = Marc UND IN = Kreuzbruck) ODER...ODER (In = Thomas UND In = Heckel))

with IN the Code for „inventor“.

A number of applicants/proprietors is also already known. We use Airbus Operations GmbH, EADS Deutschland GmbH, AneCom AeroTest GmbH, BAM, BBAT Berlin Brandenburg Aerospace Technology, Deutsches Zentrum für Luft- und Raumfahrt e.V. as leading applicants/proprietors. This leads to

PY > 2010 UND (PC= DE ODER PC= EP ODER PC=US) UND ((PA= Airbus UND PA= Airbus) ODER (PA= EADS) ODER (PA= AneCom?) ODER (PA= Berlin UND PA=Brandenburg UND PA= Aerospace) ODER (PA= Deutsches UND PA= Zentrum UND PA= Raumfahrt)

The hitlist includes many hits which are not interesting, for example a Patent Publication called „Heat insulating cover for a gas turbine engine“. While the patent may be good and valuable for others,



searching for testing devices this patent is irrelevant. It will, therefore, have to be omitted. This can be effected by using keywords in addition to the applicants and/or inventors. Keywords are coded “BI”. Here we use keywords such as “test”, “simulation”, “air” and “space”. In order to obtain a list also comprising words with fragments thereof, the sign “?” can be added. The search code then reads:

PY > 2010 UND (PC= DE ODER PC= EP ODER PC=US) UND (PA= Airbus ODER PA= EADS ODER PA= AneCom? ODER (PA= Berlin UND PA=Brandenburg UND PA= Aerospace) ODER (PA= Deutsches UND PA= Zentrum UND PA= Raumfahrt) UND (BI=test? ODER BI=simulat? ODER BI= aer? ODER BI= air? ODER BI= ?space)

### Hits

The hitlist can be evaluated and relevant IPC classes can be chosen. Highly relevant classes in the field of testing are:

G01N: INVESTIGATING OR ANALYSING MATERIALS BY DETERMINING THEIR CHEMICAL OR PHYSICAL PROPERTIES

G01M: TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING OF STRUCTURES OR APPARATUS

Once the relevant classes are found the search is straight forward. Limit year, countries and technological field (IPC-classes) and if the list is still too long, limit further by keywords and evaluate the hit list.

If only granted patents shall be considered (i.e. “B”-documents), the resulting list in the present example is

EP 1 364 203 9.Feb 2011 Lockheed Martin Corporation

*Remote Laser Beam Delivery System and Method for Use for Ultrasonic Testing Purposes*

DE 20 20011 108 834 U1 23.Jan 2012 FTI Engineering Network GmbH

*Messgerät für die Erkennung, Auswertung und Ergebnissicherung von Schäden an Flugzeugfenstern mit Hilfe der Dunkelfeld-Beleuchtungsmethode*

DE 10 2012 101 467 B4 31.Okt 2013 BAM Bundesanstalt für Materialforschung

*Vorrichtung zur thermografischen Prüfung auf Defekte insbesondere auf Risse in Oberflächen und Hohlräumen*

DE 10 2007 019 402 B4 25. Aug 2011 Airbus Operations GmbH



*Verfahren zur Durchführung eines Bodenvibrationstests bei Flugzeugen*

DE 10 2008 041 916 B3 21. Jan 2010 AneCom AeroTest GmbH

*Testvorrichtung für den Fan eines Flugzeugtriebwerks*

DE 10 2007 019 402 B4 25. Aug 2011 Airbus Operations GmbH

*Verfahren zur Durchführung eines Bodenvibrationstests bei Flugzeugen*

US 8 096 185 B2 17. Jan 2012 Airbus Operations GmbH

*Apparatus for Performing Ground Vibration Tests on Airplanes*

A click on the .pdf-sign on the right hand side will provide the first page of the document with all relevant data. A full document can be downloaded after filling in the verification string upon request.

In the full document the claims can be found. US 8 096 185 B2, for example, claims:

1. A system for performing a ground vibration test on an airplane, comprising:
  - a plurality of vibration exciters coupled to a plurality of locations on the airplane that operate to excite the airplane to vibrate;
  - a plurality of measuring transducers coupled to the airplane and operating to produce a plurality of measuring values;
  - at least one holding device, including a hydraulic lift, that provides an undamped, and substantially rigid support for the airplane between the airplane and ground; and
  - a processing system comprising an evaluator that implements a predetermined, simple, rigid holding model for the substantially rigid support.

Fig.5 Typical patent claim of US Patent

The results of the above search in the field of testing are listed below in table 1.

Veröffentlichungsnummer	Titel	Anmelder
<b>WO 2012/152517 A1</b>	Magnetoelastischer Drehmomentsensor	SIEMENS AG
<b>WO 2011/023720 A1</b>	Fernmesssystem und Verfahren zum Durchführen eines Prüfverfahrens an einem entfernten Objekt	AIRBUS Operations GmbH
<b>EP 2 554 360 A1</b>	Generativ hergestelltes Bauteil mit wenigstens einer Marke und Verfahren zum Ausbilden, Reparieren und/oder Austauschen eines derartigen Bauteils	MTU Aero Engines GmbH
<b>EP 2 538 241 A2</b>	Advanced remote nondestructive inspection system and process	The Boeing Company
<b>EP 2 434 149 A1</b>	Auto-Diagnostic and methods for wind-power generators	Gamesa Innovation Technology, S.L.
<b>EP 2 399 791 A1</b>	Vorrichtung und Verfahren zum Funksteuern eines mobile Bremsprobegerätes	DB Schenker Rail Deutschland AG

<b>EP 2 278 494 A2</b>	Remote aircraft manufacturing, monitoring, maintenance and management system	The Boeing Company
<b>EP 2 153 581 B1</b>	Fernprüfsystem und Verfahren	Astrium Limited Stevenage
<b>EP 1 357 295 A2</b>	Verdichter in mehrstufiger Axialbauart	MTU Aero Engines GmbH
<b>DE 21 2011 100 091 U1</b>	System zum Detektieren von nachteiligen Atmosphärenbedingungen vor einem Flugzeug	Norsk Institutt for Luftforskning
<b>DE 11 2007 001 034 B4</b>	Temperatursonde und Verfahren zur Herstellung derselben	Northrop Grumman Space & Mission Systems Corporation
<b>DE 10 2012 102 755 A1</b>	Verfahren zur Entwicklung oder Modifikation eines technischen Produkts	4cost GmbH
<b>DE 10 2011 103 857 A1</b>	Verfahren zur Ermittlung einer Wirbelgeometrie	Deutsches Zentrum für Luft- und Raumfahrt e.V.
<b>DE 10 2011 080 282 A1</b>	Verfahren und Messvorrichtung zur Untersuchung eines magnetischen Werkstücks	Siemens AG
<b>DE 10 2011 075 391 A1</b>	Magnetoelastischer Drehmomentsensor	Siemens AG
<b>DE 10 2011 050 801 A1</b>	Verfahren zum Enteisen von Rotorblättern eines Hubschraubers und Vorrichtung zur Durchführung des Verfahrens an dem Hubschrauber	Deutsches Zentrum für Luft- und Raumfahrt e.V.
<b>DE 10 2011 007 434 A1</b>	Simulationsmodell für eine Windenergieanlage sowie Erstellung und Verwendung	Suzlon Energy GmbH
<b>DE 10 2010 060 944 B3</b>	Wärmedämmende Auskleidung für eine Fluggasturbine	BBAT Berlin Brandenburg Aerospace Technology AG
<b>DE 10 2010 048 950 A1</b>	Diagnosesystem und Diagnoseverfahren, Gehäusebauteil eines Schmiermittelbehälters	Airbus Operations GmbH; EADS Deutschland GmbH
<b>DE 2010 028 311 A1</b>	System und Verfahren zur Minimierung von Buffeting	Airbus Operations GmbH
<b>DE 10 2010 025 954 A1</b>	Verfahren zur Anordnung zur vollständigen oder teilweisen Nachbildung und/oder Simulation eines Automatisierungssystems	ABB Technology AG
<b>DE 10 2010 024 541 B4</b>	Verfahren zur Abfrage von Mess- und/oder Zustandsdaten aus einem Datenspeicher eines scharfen unbemannten	MBDA Deutschland GmbH

	Flugkörpers sowie Vorrichtung zur Durchführung des Verfahrens	
<b>DE 10 2010 015 889 A1</b>	Telemetrieordnung zur Datenübermittlung von einem rotierenden Bauteil	AneCom AeroTest GmbH
<b>DE 10 2010 002 759 A1</b>	Radarsensor mit Selbsttesteinrichtung	Robert Bosch GmbH
<b>DE 10 2010 000 392 A1</b>	Verwendung von Kohlenstoff-Nanoröhrchen in einem Schnelle-Mikrofon für den Hör- und Ultraschallbereich	BAM
<b>DE 10 2010 000 391 A1</b>	Vorrichtung und Verfahren zur zerstörungsfreien Materialprüfung mit Ultraschall	BAM
<b>DE 10 2007 045 205 B4</b>	Vorrichtung zur Bestimmung des minimalen Abstands zwischen zwei Außenlasten an einem Flugzeug oder Flugkörper während der Abtrennung einer der beiden Außenlasten	EADS Deutschland GmbH
<b>EP 2 546 642 A2</b>	Vorrichtung und Verfahren zur Überwachung einer drehenden Welle mittels Longitudinaler Ultraschallwellen	BAM
<b>DE 10 2012 105 474 A1</b>	Verbesserte Diagnostik bei einem Flugzeug	GE Aviation Systems Ltd.
<b>DE 10 2012 102 712 A1</b>	Vorrichtung und Verfahren zum Testen eines Industriegasturbinenantriebs und Bauteilen davon	Florida Turbine Technologies, Inc.
<b>DE 10 2012 006 177 A1</b>	Verfahren zum Ermitteln eines Luftwiderstand eines Kraftwagens charakterisierenden Werts sowie Fahrzeugrad	Daimler AG
<b>DE 10 2012 006 155 A1</b>	Sensoreinrichtung und Verfahren zur Detektierung und Lokalisierung von Rissen in Bauteilen	Otto-von Guericke-Universität Magdeburg
<b>DE 10 2011 102 443 A1</b>	Stoßprüfstand	Rainer GmbH
<b>DE 10 2011 054 A1</b>	Anordnung für einen Windkanal sowie Verfahren dafür	Dr. Ing. h.c.F. Porsche AG
<b>DE 10 2011 054 265 A1</b>	Aeodynamiktestverfahren und -einrichtung	Lockheed Martin Corp.
<b>DE 10 2011 051 762 A1</b>	Vorrichtung und Verfahren zur Überwachung einer drehenden Welle mittels transversaler Ultraschallwellen	BAM
<b>DE 10 2011 051 759 A1</b>	Vorrichtung und Verfahren zur Überwachung einer drehenden Welle mittels geführter Ultraschallwellen	BAM
<b>DE 10 2010 037 051 A1</b>	Mechanischer Antriebsstrang zum Testen von Verdichtungsrichtungen und Gasturbinen im Originalmaßstab	General Electric Co.
<b>EP 2 657 674</b>	Test bench for suspensions of vehicles	Giuliano Group S.p.A.
<b>EP 2 508 861 A1</b>	System and method for determining inertia properties of a rigid body	Resonic GmbH



<b>DE 10 2007 019 402 B4</b>	Verfahren zur Durchführung eines Bodenvibrationstests bei Flugzeugen	Airbus Operations GmbH
<b>DE 10 2008 041 916 B3</b>	Testvorrichtung für den Fan eines Flugzeugtriebwerks	AneCom AeroTest GmbH
<b>DE 10 2012 101 467 B4</b>	Vorrichtung zur thermografischen Prüfung auf Defekte insbesondere auf Risse in Oberflächen und Hohlräumen	BAM
<b>DE 20 2011 108 834 U1</b>	Messgerät für die Erkennung, Auswertung und Ergebnissicherung von Schäden an Flugzeugfenstern mit Hilfe der Dunkelfeld-Beleuchtungsmethode	FTI Engineering Network GmbH
<b>EP 1 364 203 B1</b>	Verfahren und Vorrichtung zur Fernverteilung eines Laserstrahls bei der Ultraschallprüfung	Lockheed Martin Corporation
<b>WO 02/063607 A2</b>	Remote Laser beam delivery system and method for use with a gantry positioning system for ultrasonic testing purposes	Lockheed Martin Corporation

Table 1 Hitlist

## Literatur

1. Renate Weisse, "Erfindungen, Patente, Lizenzen" Ratgeber für die Praxis, 4.Aufl. Springer Vieweg
2. Deutsches Patentgesetz, <http://www.gesetze-im-internet.de/patg/index.html>
3. Europäisches Patentübereinkommen

[http://documents.epo.org/projects/babylon/eponet.nsf/0/00E0CD7FD461C0D5C1257C060050C376/\\$File/EPC\\_15th\\_edition\\_2013.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/00E0CD7FD461C0D5C1257C060050C376/$File/EPC_15th_edition_2013.pdf)

## About.



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Master of Laws (LL.M.) in European Intellectual Property

Publication „Erfindungen, Patente, Lizenzen“, 4. Aufl. Springer Verlag Heidelberg 2014

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