



POLITECNICO
MILANO 1863

An introduction to patent prior art searches

Research Skills: "IP"hd Seminar
June 19th 2018

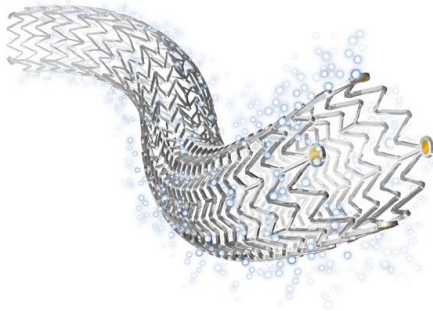
Massimo Barbieri

Politecnico di Milano
Technology Transfer Office

- Example (Espacenet)
- Classification codes
- Example (Orbit)
- Discussion and conclusions
- Summarizing



Example of state-of-the-art search: drug eluting stents



A **drug-eluting stent (DES)** is a peripheral or coronary stent (a scaffold) placed into narrowed, diseased peripheral or coronary arteries that slowly releases a drug to block cell proliferation. (*Wikipedia*)

Scope of patent searches: to find out documents that claim similar technical features and not a mere match of words.

A patent search may be carried out:

- by keywords (intuitive but subjective);
- by classification codes;
- by citations.



Free of charge sources (provided by national or regional patent offices)

- **Espacenet**, USPTO, JPO, UIBM, WIPO

Free of charge sources (provided by independent producers)

- [GOOGLE PATENTS](#), [Free Patents Online](#)

Professional sources

- Patsnap, Thomson Innovation, Patbase, **Orbit**, TotalPatent



The choice of the database depends essentially on the type of information to be searched: for instance, the search of chemical compounds, chemical reactions or "*Markush*" structures on specific databases (such as Dialog, STN, Orbit).

Coverage

- ✚ Time
- ✚ Country of publication



The screenshot shows the Espacenet Patent search website. The header includes the Espacenet logo, the text "Espacenet Patent search", and language options (Deutsch, English, Français) and a "Contact" link. A "Change country" dropdown menu is also present. Below the header, there is a navigation bar with links for "About Espacenet" and "Other EPO online services". The main content area features a "Smart search" section with a search bar and a "Search" button. To the left of the search bar, there is a sidebar with links for "Advanced search", "Classification search", "Maintenance news", "Espacenet outages", "News flashes", "Latest updates", and "Related links". The "Espacenet outages" section contains a message about technical maintenance work on December 17, 2015. The "Did you know that..." section explains that Espacenet automatically hides duplicate patent documents. The "Job vacancies" section mentions that the EPO is looking for engineers and scientists. The "Online products – need some answers?" section encourages users to use the discussion forum. At the bottom, there is a section titled "Espacenet: Intro" with a video player showing a person with a red exclamation mark above their head.

http://worldwide.espacenet.com

Europäisches Patentamt
European Patent Office
Office européen des brevets

Deutsch English Français
Contact
Change country ▾

« About Espacenet Other EPO online services ▾

Search Result list My patents list (0) Query history Settings Help

Smart search
Advanced search
Classification search

Maintenance news —

Espacenet outages
Time zone: CET
Mon-Sun 05:00-ca.05:30
Owing to technical maintenance work the Espacenet and OPS services may be temporarily unavailable this evening, 17 December 2015, between 16:00 and 18:00 CET. → [read more...](#)

News flashes +
Latest updates +
Related links +

Smart search: Siemens EP 2007
Clear Search


Did you know that...
.... Espacenet automatically hides duplicate patent documents in your result list? This is because it displays only one patent document per family, so the total number of results you get initially may well decrease as you click through the list. The technical term for this is "deduplication".

Job vacancies
The EPO is looking for engineers and scientists to join an international team working at the forefront of technology. See if your profile matches our current vacancies.

Online products – need some answers?
Use the discussion forum and get all the latest news and views about our online products. Read the regular postings from the forum team, post your questions – and answer those of other users.

Espacenet: Intro

Advanced search


Select the collection you want to search in 


Worldwide - collection of published applications from 100+ countries
Worldwide - collection of published applications from 100+ countries
Worldwide EN - collection of published applications in English
Worldwide FR - collection des demandes publiées en Français
Worldwide DE - Sammlung veröffentlichter Anmeldungen auf Deutsch

Enter keywords


Enter your search terms - Enter entries separated by AND, OR, NOT


Enter keywords in English


Title:  plastic and bicycle

Title or abstract:  hair


Enter numbers with or without country code

Publication number:  WO2008014520


Application number:  DE19971031696


Priority number:  WO1995US15925

Enter one or more dates or date ranges


Publication date:  yyyyymmdd


Enter name of one or more persons/organisations

Applicant(s):  Institut Pasteur

Inventor(s):  Smith

Enter one or more classification symbols

CPC 


IPC  H03M1/12

Clear Search

Smart search
Advanced search
Classification search

Quick help

- How many search terms can I enter per field?
- How do I enter words from the title or abstract?
- How do I enter words from the description or claims?
- Can I use truncation/wildcards?
- How do I enter publication, application, priority and NPL reference numbers?
- How do I enter the names of persons and organisations?
- What is the difference between the IPC and the CPC?
- What formats can I use for the publication date?
- How do I enter a date range for a publication date search?
- Can I save my query?

Related links 

Select the database



You can combine your search terms using the Boolean operators **AND**, **OR** and **NOT**. You can use a maximum of nine operators per input field, and a total of nineteen within the search mask as a whole.

The **OR** operator

You can use the OR operator to extend the range of your search.

Example: car OR automobile OR vehicle

The **AND** operator

You can use the AND operator to limit the range of your search. Your query will return only those documents which contain all the terms combined with the AND operator. AND is the default operator for the title, abstract, inventor, applicant, CPC and IPC fields.

The **NOT** operator

You can also use the NOT operator to limit the range of your search.

Example: nail NOT finger

Your query will return only those documents which do not contain the term following the NOT operator.



To extend your search, you can use truncation symbols (wildcards) to include, for example, the plural form of a word, or alternative spellings.

There are **three different wildcard** characters available in Espacenet:

- * stands for a string of characters of any length
- ? stands for zero or one character
- # stands for exactly one character

Example: to find the word

- car or cars → type car? in the title field
- polymerization or polymerisation → polymeri#ation
- polymeric, polymer, polymerization, to polymeriz → polymer*

Restrictions on the use of wildcards:

http://ep.espacenet.com/help?locale=en_EP&method=handleHelpTopic&topic=truncation



US2017319362 (A1)

Bibliographic data

Description
Claims
Mosaics
Original document
Cited documents
Citing documents
INPADOC legal status
INPADOC patent family

Bibliographic data: US2017319362 (A1)

★ In my patents list Report data error

DRUG-ELUTING STENT

Page bookmark [US2017319362 \(A1\)](#) - [C](#)

Inventor(s): MANABE MATSUYA [JP]

Applicant(s): JIMRO CO LTD [JP] [±](#)

Classification: - international: **A61F2**
- cooperative: default

C-sets

Application number: US201515522406 20151

Priority number(s): JP20140219159 201410

Also published as: [CN107106309 \(A\)](#) [D](#)
→ [more](#)

Abstract of US2017319362 (A1)

Translate this text into [i](#)

Select language [▼](#)

patenttranslate

A drug-eluting stent whose main body is made of cilostazol and a bioabsorbable polymer, wherein

HADY [EG]
(+1)

JOSHUA [US]
(+2)

☐ 5. **DRUG-ELUTING STENT AND
ENDOTHELIAL CELL LAYERS**

★ Inventor: Applicant: CPC: IPC: Publication info: Priority date:

Symbol Classification and description

A HUMAN NECESSITIES [S](#)

HEALTH; AMUSEMENT

A61 MEDICAL OR VETERINARY SCIENCE; HYGIENE

A61F FILTERS IMPLANTABLE INTO BLOOD VESSELS; PROSTHESES; DEVICES PROVIDING PATENCY TO, OR PREVENTING COLLAPSING OF, TUBULAR STRUCTURES OF THE BODY, E.G. STENTS; ORTHOPAEDIC, NURSING OR CONTRACEPTIVE DEVICES; FOMENTATION; TREATMENT OR PROTECTION OF EYES OR EARS; BANDAGES, DRESSINGS OR ABSORBENT PADS; FIRST-AID KITS (dental prosthetics **A61C**) [S](#) [D](#) [!](#)

Filters; Devices providing patency to tubular structures; Prostheses; Accessories

A61F 2/00 Filters implantable into blood vessels; Prostheses, i.e. artificial substitutes or replacements for parts of the body; Appliances for connecting them with the body; Devices providing patency to, or preventing collapsing of, tubular structures of the body, e.g. stents (as cosmetic articles, see the relevant subclasses, e.g. wigs, hair pieces, **A41G 3/00**, **A41G 5/00**, artificial nails **A45D 31/00**; dental prostheses **A61C 13/00**; materials for prostheses **A61L 27/00**; artificial hearts **A61M 1/10**; artificial kidneys **A61M 1/14**) [D](#)

A61F 2/82 • Devices providing patency to, or preventing collapsing of, tubular structures of the body, e.g. stents (stent-grafts for tubular structures of the body other than blood vessels **A61F 2/04**; stent-grafts for blood vessels **A61F 2/07**; instruments specially adapted for placement or removal of stents or stent-grafts **A61F 2/95**; for closing wounds, or holding wounds closed **A61B 17/04** - **A61B 17/115**; dilators **A61M 29/00**) [D](#)



<< About Espacenet Other EPO online services ▼

Search Result list ★ My patents list (0) Query history Settings Help

Smart search
 Advanced search
Classification search

Quick help

- What is the Cooperative Patent Classification system?
- How do I enter classification symbols?
- What do the different buttons mean?
- Can I retrieve a classification using keywords?
- Can I start a new search using the classifications listed?
- Where can I view the description of a particular CPC class?
- What is the meaning of the stars in front of the classifications found?
- What does the text in brackets mean?

Selected classifications

nothing selected

Find patents

Copy to search form

Cooperative Patent Classification

Search for

Search

View section | Index | A | B | C | D | E | F | G | H | Y



A »

Symbol	Classification and description
★★★ <input type="checkbox"/> A61F 2/00	Filters implantable into blood vessels; Prostheses, i.e. artificial substitutes or replacements for parts of the body; Appliances for connecting them with the body; Devices providing patency to, or preventing collapsing of, tubular structures of the body, e.g. stents (as cosmetic articles, see the relevant subclasses, e.g. wigs, hair pieces, A41G 3/00 , A41G 5/00 , artificial nails A45D 31/00 ; dental prostheses A61C 13/00 ; materials for prostheses A61L 27/00 ; artificial hearts A61M 1/10 ; artificial kidneys A61M 1/14)
▼ ★★★★★ <input type="checkbox"/> A61F 2250/00	Special features of prostheses classified in groups A61F 2/00 - A61F 2/26 or A61F 2/82 or A61F 9/00 or A61F 11/00 or subgroups thereof
▼ ★★★★★ <input type="checkbox"/> A61F 2230/00	Geometry of prostheses classified in groups A61F 2/00 - A61F 2/26 or A61F 2/82 or A61F 9/00 or A61F 11/00 or subgroups thereof
▼ ★★★★★ <input type="checkbox"/> A61F 2210/00	Particular material properties of prostheses classified in groups A61F 2/00 - A61F 2/26 or A61F 2/82 or A61F 9/00 or A61F 11/00 or subgroups thereof
▼ ★★★★★ <input type="checkbox"/> A61F 2220/00	Fixations or connections for prostheses classified in groups A61F 2/00 - A61F 2/26 or A61F 2/82 or A61F 9/00 or A61F 11/00 or subgroups thereof
▼ ★★★★★ <input type="checkbox"/> A61L 31/00	Materials for other surgical articles {, e.g. stents, stent-grafts, shunts, surgical drapes, guide wires, materials for adhesion prevention, occluding devices, surgical gloves, tissue fixation devices (shape or structure of stent-grafts A61F 2/07 , of stents A61F 2/82 , of surgical gloves A61B 42/00 , of surgical drapes A61B 46/00 , of occluding devices A61B 17/12022)}
▼ ★★★★★ <input type="checkbox"/> A61B 17/00	Surgical instruments, devices or methods, e.g. tourniquets (A61B 18/00 takes precedence; contraceptive devices, pessaries, or applicators therefor A61F 6/00 ; eye surgery A61F 9/007 ; ear surgery A61F 11/00)
▼ ★★★★★ <input type="checkbox"/> A61F 2240/00	Manufacturing or designing of prostheses classified in groups A61F 2/00 - A61F 2/26 or A61F 2/82 or A61F 9/00 or A61F 11/00 or subgroups thereof
▼ ★★★★★ <input type="checkbox"/> A61L 2300/00	Biologically active materials used in bandages, wound dressings, absorbent pads or medical devices

STENT:
A61F 2/82 ÷ A61F 2/945

→ **A61F 2/8+**
OR A61F 2/9+


<input type="checkbox"/> A61F 2/82	<ul style="list-style-type: none"> • Devices providing patency to, or preventing collapsing of, tubular structures of the body, e.g. stents (stent-grafts for tubular structures of the body other than blood vessels A61F 2/04; stent-grafts for blood vessels A61F 2/07; instruments specially adapted for placement or removal of stents or stent-grafts A61F 2/95; for closing wounds, or holding wounds closed A61B 17/03; dilators A61M 29/00)
<input type="checkbox"/> A61F 2/844	<ul style="list-style-type: none"> •• folded prior to deployment
<input type="checkbox"/> A61F 2/848	<ul style="list-style-type: none"> •• having means for fixation to the vessel wall, e.g. barbs
<input type="checkbox"/> A61F 2/852	<ul style="list-style-type: none"> •• Two or more distinct overlapping stents
<input type="checkbox"/> A61F 2/856	<ul style="list-style-type: none"> •• Single tubular stent with a side portal passage
<input type="checkbox"/> A61F 2/86	<ul style="list-style-type: none"> •• Stents in a form characterised by the wire-like elements; Stents in the form characterised by a net-like or mesh-like structure
<input type="checkbox"/> A61F 2/88	<ul style="list-style-type: none"> ••• the wire-like elements formed as helical or spiral coils (forming a net-like or mesh-like structure A61F 2/90)
<input type="checkbox"/> A61F 2/885	<ul style="list-style-type: none"> •••• { comprising a coil including a plurality of spiral or helical sections with alternate directions around a central axis}
<input type="checkbox"/> A61F 2/89	<ul style="list-style-type: none"> ••• the wire-like elements comprising two or more adjacent rings flexibly connected by separate members
<input type="checkbox"/> A61F 2/90	<ul style="list-style-type: none"> ••• characterised by a net-like or mesh-like structure
<input type="checkbox"/> A61F 2/91	<ul style="list-style-type: none"> •••• made from perforated sheet material or tubes, e.g. perforated by laser cuts or etched holes
<input type="checkbox"/> A61F 2/915	<ul style="list-style-type: none"> ••••• with bands having a meander structure, adjacent bands being connected to each other
<input type="checkbox"/> A61F 2/92	<ul style="list-style-type: none"> •• Stents in the form of a rolled-up sheet expanding after insertion into the vessel, { e.g. with a spiral shape in cross-section}
<input type="checkbox"/> A61F 2/93	<ul style="list-style-type: none"> ••• circumferentially expandable by using ratcheting locks
<input type="checkbox"/> A61F 2/94	<ul style="list-style-type: none"> •• Stents retaining their form, i.e. not being deformable, after placement in the predetermined place
<input type="checkbox"/> A61F 2/945	<ul style="list-style-type: none"> ••• hardenable, e.g. stents formed in situ




Result list

☐ Select all (0/25)

 Compact

 Export (CSV | XLS)

 Download covers

 Print

Approximately 490 results found in the Worldwide database for:
drug eluting stent in the title or abstract AND **A61F2** as the IPC classification

1 ▶

Results are sorted by date of upload in database

☐ 1. **Stents having protruding drug -delivery features and associated systems and methods**

★	Inventor: FULKERSON JOHN RIZK ISA (+2)	Applicant: REFLOW MEDICAL INC	CPC: <u>A61F2/82</u> <u>A61F2/848</u> <u>A61F2/86</u> (+10)	IPC: <u>A61F2/82</u> <u>A61F2/86</u> <u>A61F2/95</u> (+1)	Publication info: AU2016339033 (A1) 2018-04-26	Priority date: 2015-10-12
---	---	---	--	--	---	-------------------------------------

☐ 2. **Treatment Systems Processes and Devices Addressing Cerebral Vasospasm/Vasoconstriction**

★	Inventor: FERRERA DAVID A [US] BENJAMIN JOSHUA [US] (+2)	Applicant: NEURVANA MEDICAL LLC [US]	CPC: <u>A61F2/844</u> <u>A61F2/90</u> <u>A61F2/966</u> (+11)	IPC: <u>A61F2/844</u> A61L31/02 A61L31/14 (+2)	Publication info: US2018055666 (A1) 2018-03-01	Priority date: 2015-09-30
---	--	--	---	---	---	-------------------------------------

☐ 3. **DRUG ELUTING STENT AND METHOD OF USE OF THE SAME FOR ENABLING RESTORATION OF FUNCTIONAL ENDOTHELIAL CELL LAYERS**

★	Inventor: SUN JIANHUA [CN] BUREAU CHRISTOPHE [CN] (+3)	Applicant: SINO MEDICAL SCIENCES TECH INC [CN]	CPC: <u>A61F2/82</u> <u>A61F2250/0067</u> <u>A61L2300/416</u> (+10)	IPC: <u>A61F2/82</u> A61L31/02 A61L31/10 (+1)	Publication info: US2018042738 (A1) 2018-02-15	Priority date: 2006-06-13
---	---	---	--	--	---	-------------------------------------

☐ 4. **Drug-eluting intravascular stent**

★	Inventor: LU YE	Applicant: CHENGDU CHUANGKEZHILIA TECH CO LTD	CPC:	IPC: <u>A61F2/90</u> A61L31/06 A61L31/14 (+1)	Publication info: CN107669380 (A) 2018-02-09	Priority date: 2017-11-29
---	---------------------------	--	-------------	--	---	-------------------------------------



- the number of displayed documents is limited to 500;
- the maximum number of search terms per field is ten;
- a maximum of 20 search terms and 19 operators per mask is allowed;
- The search languages are English, French and German;
- Full text search is available in "Worldwide collection of published applications" (in English, French and German);
- IPC and CPC are the only supported classification systems.



- Example (Espacenet)
- **Classification codes**
- Example (Orbit)
- Discussion and conclusions
- Summarizing



Classification is a means of organizing and retrieving patent documents.

Patent offices developed classification systems in the 19th century in order to cope with the growing volume of patents and non-patent literature.

The most commonly used patent classifications today are the IPC and the CPC.

The IPC is a hierarchical classification systems. The top level consists of 8 sections (A - H) which are divided into 70,000 subdivisions called classes, subclasses, groups and subgroups.

The CPC is an enhanced version of the IPC, uses the same structure as the IPC but with more subdivisions.

Classification system	No. of subgroups
IPC	70,000
CPC	250,000
FI (File Index)	190,000
F-terms	350,000

web2.wipo.int

International Patent Classification (IPC) CLASSIFICATIONS/IPC/IPCPUB v6.3

WIPO IP SERVICES International Patent Classification (IPC) Official Publication

WORLD INTELLECTUAL PROPERTY ORGANIZATION

IPC Home Page - Help

Version: 2016.01

Current symbol: [Go to]

Language: English (selected), French, English/French

View mode: full (selected), path, hierarchic

Subclass indexes, Guidance Headings, Notes

Search: Terms, Cross-references

Assistance: STATS, Text categorization

Number of displayed entries: 500

Last modified: 20.12.2015
IPCPUB v6.3

Scheme	RCL	Compilation	Catchwords	Guide to the IPC
A		HUMAN NECESSITIES		
B		PERFORMING OPERATIONS; TRANSPORTING		
C		CHEMISTRY; METALLURGY		
D		TEXTILES; PAPER		
E		FIXED CONSTRUCTIONS		
F		MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING		
G		PHYSICS		
H		ELECTRICITY		

<http://web2.wipo.int/classifications/ipc/ipcpub/#refresh=page>

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

WIPO | PCT



(10) International Publication Number

WO 2015/015464 A1

(43) International Publication Date
5 February 2015 (05.02.2015)

(51) International Patent Classification:

A61N 1/40 (2006.01) C09D 165/00 (2006.01)
C08J 7/04 (2006.01)

(21) International Application Number:

PCT/IB2014/063616

(22) International Filing Date:

1 August 2014 (01.08.2014)

(25) Filing Language:

Italian

(26) Publication Language:

English

(30) Priority Data:

TO2013A000665 2 August 2013 (02.08.2013) IT

(71) Applicants: FONDAZIONE ISTITUTO ITALIANO DI
TECNOLOGIA [IT/IT]; Via Morego 30, I-16163 Genova
(IT). ISTITUTO DON CALABRIA - OSPEDALE
CLASSIFICATO SACRO CUORE [IT/IT]; Via San
Zeno in Monte 23, I-37129 Verona (IT).(72) Inventors: GHEZZI, Diego; Via Morego 45/18, I-16163
Genova (IT). BENFENATI, Fabio; Via Ravano 3, I-
16167 Genova (IT). LANZANI, Guglielmo; Via Petrocchi
21, I-20127 Milano (IT). ANTOGNAZZA, Maria Rosa;
Via dei Mughetti 4, I-21040 VENEGONO INFERIORE
(Varese) (IT). FREDDI, Giuliano; Via Tolstoj 120/L, I-
20030 SENAGO (Milano) (IT). DONELLI, Ilaria; Via
Vittorio Gassman 15, I-10128 Milano (IT). METE, Maur-
izio; Via Bevano 81, I-61032 FANO (Pesaro e Urbino)
(IT). PERTILE, Grazia; Via Colle Masua 18, I-37024
NEGRAR (Verona) (IT).(74) Agents: VANZINI, Christian et al.; c/o Jacobacci & Part-
ners SpA, Corso Emilia 8, I-10152 Torino (IT).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).





Declarations under Rule 4.17:











- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))



Published:

- with international search report (Art. 21(3))



< to list Search patents...  Move or duplicate  Patent copies  Export  Email (permalinks)








Biblio  Claims  Description  Key content  Concepts  Fulltext  Kwic  Legal status  Citations  Timeline  Image

 Translate 

An organic device for the photoinhibition of excitable cells




















AB
(WO201515464)
Device for inhibiting the electrical activity of an excitable cell through the application of a pulse of light, comprising a substrate (5) and a photoreactive film (4, 6) both of non-conducting material and laid directly on one another, in which the photoreactive film includes a layer of semiconductor polymer material (4) and has an interface surface (6a) which can be placed in contact with an excitable cell (2) and an electrolyte solution (1). After absorbing light, when placed in contact with the excitable cell and the electrolyte solution, the photoreactive film produces a potential difference across this interface surface which is capable of giving rise to hyperpolarisation of the membrane of the excitable cell.

List of publications

<input type="checkbox"/>	Publication number	Publ. date	Appl. Number	Appl. Date	Document type	
	ITTO20130665	2015-02-03	2013IT-TO00665	2013-08-02	A1 - Application for patent of invention	  
PCT	WO2015015464	2015-02-05	2014WO-IB63616	2014-08-01	A1 - Published application with search report	  
IN	GHEZZI DIEGO BENFENATI FABIO LANZANI GUGLIELMO ANTONGNAZZA MARIA ROSA FREDDI GIULIANO DONELLI ILARIA METE MAURIZIO PERTILE GRAZIA					
PA	FOUNDATION ISTITUTO ITALIANO DI TECNOLOGIA INNOVHUB STAZIONI SPERIMENTALI PER L'INDUSTRIA AZ ISTITUTO DON CALABRIA OSPEDALE CL ASSIFICATO SAC ISTITUTO DON CALABRIA OSPEDALE CLASSIFICATO SACRO CUORE					
RP	(WO201515464) VANZINI, Christian et al. [IT]					
PR	2013IT-TO00665 2013-08-02					
TECD	Basic materials chemistry Medical technology Other special machines					
IC	A61N-001/40* C08J-007/04 C09D-165/00					
CPC	A61N-001/40 C08J-007/04/5* C08J-2300/16 C08J-2465/00 C09D-165/00					











❑ Section	C (chemistry, metallurgy)
❑ Class	C01 (inorganic chemistry)
❑ Subclass	C01B (non metallic compounds and)
❑ Group	C01B 31/00 (carbon and carbon compounds)
❑ Subgroup	C01B 31/04 (graphite)

	C01B 31/00	Carbon; Compounds thereof (C01B 21/00, C01B 23/00 take precedence; percarbonates C01B 15/10; carbon black C09C 1/48) [2006.01]
	C01B 31/02	• Preparation of carbon (by using ultra-high pressure, e.g. for the formation of diamonds, B01J 3/06; by crystal growth C30B); Purification [2006.01]
	C01B 31/04	• • Graphite [2006.01]
	C01B 31/06	• • Diamond [2006.01]
	C01B 31/08	• Active carbon [2006.01]
	C01B 31/10	• • Preparation by using gaseous activating agents [2006.01]
	C01B 31/12	• • Preparation by using non-gaseous activating agents [2006.01]
	C01B 31/14	• • Granulation [2006.01]
	C01B 31/16	• Preparation of ion-exchanging materials from carbonaceous material [2006.01]
	C01B 31/18	• Carbon monoxide [2006.01]
	C01B 31/20	• Carbon dioxide [2006.01]
	C01B 31/22	• • Solidifying [2006.01]
	C01B 31/24	• Methods for the preparation of carbonates or bicarbonates in general (percarbonates C01B 15/10; particular individual carbonates, <u>see</u> the relevant groups of subclasses C01B-C01G, according to the cation) [2006.01]
	C01B 31/26	• Compounds containing carbon and sulfur, e.g. carbon disulfide, carbon oxysulfide; Thiophosgene [2006.01]
	C01B 31/28	• Phosgene [2006.01]
	C01B 31/30	• Carbides [2006.01]
	C01B 31/32	• • Calcium carbide [2006.01]
	C01B 31/34	• • Tungsten or molybdenum carbides [2006.01]
	C01B 31/36	• • Carbides of silicon or boron [2006.01]



http://worldwide.espacenet.com/classification?locale=en_EP#!/CPC=C01B31/00

<input type="checkbox"/> C01B 31/04	•• Graphite, including modified graphite e.g. graphitic oxides, intercalated graphite, expanded graphite or graphene		
<input type="checkbox"/> C01B 31/0407	••• {Purification; Recovery or purification of graphite formed in iron making, e.g. kish graphite}		
<input type="checkbox"/> C01B 31/0415	••• {Intercalation}		
<input type="checkbox"/> C01B 31/0423	••• {Expanded or exfoliated graphite}		
<input type="checkbox"/> C01B 31/043	••• {Graphitic oxides, graphitic acids or salts thereof}		
<input type="checkbox"/> C01B 31/0438	••• {Graphene}		
<input type="checkbox"/> C01B 31/0446	•••• {Preparation}		
<input type="checkbox"/> C01B 31/0453	••••• {by CVD}		
<input type="checkbox"/> C01B 31/0461	••••• {by epitaxial growth}		
<input type="checkbox"/> C01B 31/0469	••••• {by exfoliation}		
<input type="checkbox"/> C01B 31/0476	••••• {starting from graphitic oxide}		
<input type="checkbox"/> C01B 31/0484	•••• {After-treatments}		
<input type="checkbox"/> C01B 31/0492	••••• {Purification}		

- Example (Espacenet)
- Classification codes
- Example (Orbit)
- Discussion and conclusions
- Summarizing



Operators

OR	Finds records containing at least one of the words (in the case of a FamPat record, at least one of the members will have one or more of your terms)	sulfur or sulphur
AND	All words	plutonium AND isotope
NOT	The first term without the second term	suv NOT vesicle
F	The terms in the same field	sodium f chlorine
S	The terms in the same sentence	sodium s chlorine
P	The terms in the same paragraph	sodium p chlorine
D	The terms adjacent in any order	redundancy d check
nD	The terms adjacent, regardless of the order, separated by a maximum of n words (n value between 1 and 99)	conduct 2d electric 2d adhesive
=nD	The terms adjacent, regardless of the order, separated by exactly n words (n value between 1 and 99)	electric+ =2d conduct+ =2d adhesive
W	The terms adjacent in the order specified; treatment applied by default for two terms entered without operator	smart w card? smart card?
nW	The adjacent terms in the order specified and separated by a maximum of n words (n value between 1 and 99)	friction 9w pad?
nW	The adjacent terms in the order specified and separated exactly n words (n value between 1 and 99)	friction 9w pad?
–	The underscore allows for simultaneous searching of terms that may be written as one or two words. It will also retrieve results where there is a hyphen between terms. It can also be used in chemical formulas	air_bag +ethylen+_+carbonate+
Parentheses	Parentheses (nesting) are necessary when combining different operators	((wireless w application w protocol) or wap) not (dna or transgenic) (hair 2d (dye or dyeing)) and oxidate +

Proximity operators
(ORBIT patent database)



Example of state-of-the-art search: drug eluting stents

- ✓ **Keywords:** stent, drug delivery, drug eluting, drug releasing
- ✓ **Keyword and classification searching**

Query 1: (stent s (drug deliver+ **OR** drug elut+))/TI/AB/IW/CLMS/TX
AND ((A61F-002/8+ OR A61F-002/9+)/IPC/CPC)
→ 3170 results

→ **Query 2:** (stent s (drug deliver+ **OR** drug elut+ **OR** drug
releas+))/TI/AB/IW/CLMS/TX AND (A61F-002/8+ OR A61F-
002/9+)/IPC/CPC
→ 3364 results.



<input type="checkbox"/> A61F 2250/00	Special features of prostheses classified in groups <u>A61F 2/00</u> to <u>A61F 2/26</u> or <u>A61F 2/82</u> or <u>A61F 9/00</u> or <u>A61F 11/00</u> or subgroups thereof
<input type="checkbox"/> A61F 2250/0058	•Additional features; Implant or prostheses properties not otherwise provided for
<input type="checkbox"/> A61F 2250/0067	••Means for introducing or releasing pharmaceutical products into the body
<input type="checkbox"/> A61F 2250/0068	•••the pharmaceutical product being in a reservoir


(stent s (drug_deliver+ OR drug_elut+ OR drug_releas+))/TI/AB/IW/CLMS/TX AND ((A61F-002/8+ OR A61F-002/9+)/IPC/CPC AND (A61F-2250/006+)/IPC/CPC)

938 results for (stent s (drug_deliver+ OR drug_elut+ OR drug_releas+))/TI/AB/IW/CLMS/TX AND ((A61F-002/8+ OR A61F-002/9+)/IPC/CPC AND (A61F-2250/006+)/IPC/CPC)

Select - Title Publication 1st App. Applicant/Assignee Relevan


1 Drug eluting stent and method of making the same WO2009117193 2008-03-19 BOSTON SCIENTIFIC SCIMED* 100 %

A **drug eluting stent** comprising a multilayer tubular structure which includes at least one intermediate layer having reservoirs therein for deposition of a drug, the intermediate layer eluting drug in a lateral direction, and methods of making the same. (From US8252048 B2)



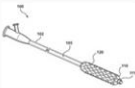
2 Drug-eluting stent system and method of producing drug-eluting stent system WO2006109668 2006-04-06 TERUMO* 89 %

This invention provides a **drug eluting stent** system provided with a **stent**, which carries thereon a biologically/physiologically active substance, and a deoxidant within a package, and a manufacturing process of the **drug eluting stent** system. The **drug eluting stent** system has a substantially extended expiration date and permits a practical application.



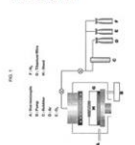
3 Drug eluting folded stent and stent delivery system US2011264187 2010-04-26 MEDTRONIC VASCULAR* 89 %

The **drug eluting** folded **stent** and a **stent** delivery system, which includes a **stent** having a plurality of struts interconnected to form a tubular body. At least one of the struts includes a U-shaped strut having in cross-section a first leg, a second leg, and a closed end connecting the first leg and the second leg, wherein the first leg, the second leg, and the closed end define a recess having a **drug release** opening opposite the closed end; and a drug coating disposed on the first leg, the second leg, and the closed end within the recess. The **drug release** opening is sized to release a drug from the drug coating at a predetermined **drug elution** rate. (From US9615948 B2)




4 Method for manufacturing of drug-releasing stent coated with titanium—oxide thin film US2011009954 2009-07-09 CHONNAM NATIONAL UNIVERSITY* 88 %

A method for manufacturing a **drug-releasing stent** is provided. The method includes providing a titanium precursor, a carrier gas and a reactant gas in a plasma vacuum chamber, and generating a plasma for 1 to 6 hours to form a titanium oxide thin film on the surface of a **stent**. The method further includes providing steam or oxygen and hydrogen in the plasma vacuum chamber and generating a low-temperature plasma for 10 minutes to 2 hours to modify the surface of the titanium oxide thin film. The method further includes reacting the titanium oxide thin film of the **stent** with a drug in an acidic solution and under an inert gas atmosphere at room temperature to 100° C. for 30 minutes to 4 hours to attach the drug.



5 Drug eluting stent with a biodegradable release layer attached with an electro-grafted primer coating US2007289088 2007-06-13 ALCHIMEDICS* ALCHIMER 88 %

A **drug eluting** preventing restenosis, avoiding thrombosis and allowing for early proliferation and migration of endothelial cells is disclosed. The **stent** has a surface with a layer that promotes proliferation and adhesion of the endothelial cells and a drug hosting biodegradable polymer coating covering the surface which is degraded to completely release the drug.



Drug eluting stent and method of making the same

Preview Image

Translate Edit Preview

List of publications

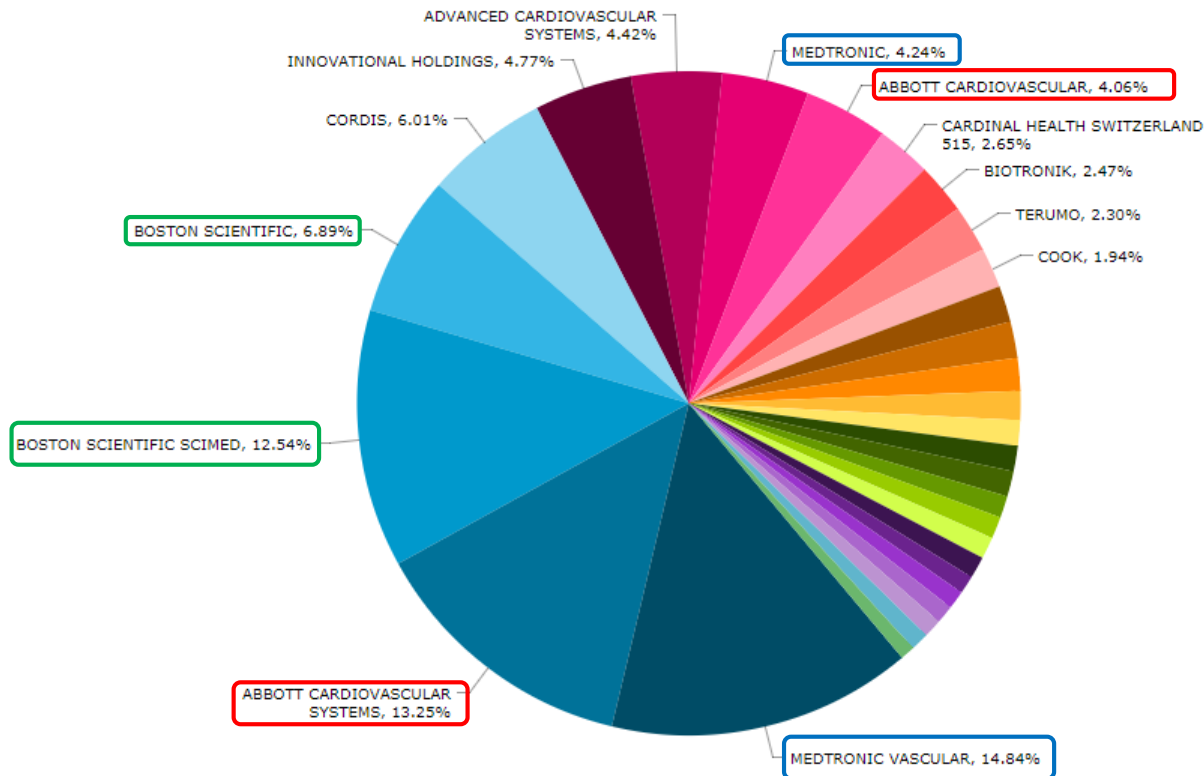
	Publ. number	Publ.	Document type
PCT	WO2009117193	2009-08-24	A2 - International application published
US	US2009240324	2009-08-24	A1 - Application published
PCT	WO2009117193	2009-11-12	A3 - Later publication of ISR with
EP	EP2276430	2011-01-26	A2 - Application published with
US	US2011166646	2011-07-07	A1 - Application published
US	US8187322	2012-05-29	B2 - Granted patent as second
US	US8252048	2012-08-28	B2 - Granted patent as second
EP	EP2276430	2013-08-28	B1 - Patent specification

Displaying records 1 - 25 of 938

938 results



Top assignees



Medtronic

**Boston
Scientific**
Advancing science for life™

Abbott



POLITECNICO MILANO 1863

Massimo Barbieri - 2018



Numbers, dates & country

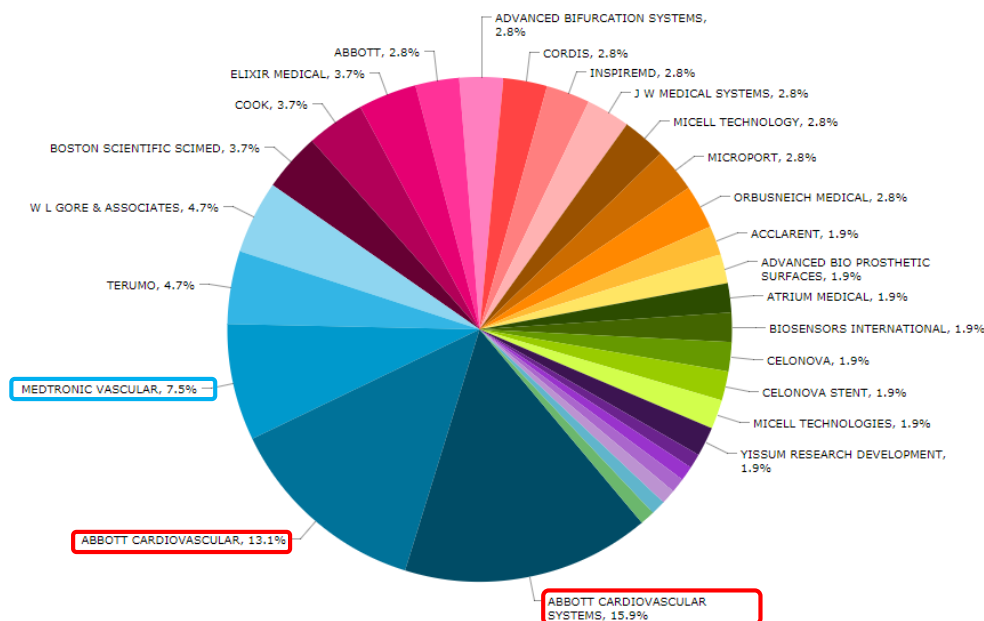
Publ. number

Date: From

Patents published in (patent authorities):

((stent s (drug_deliver+ OR drug_elut+ OR drug_releas+)))/TI/AB/IW/CLMS/TX AND ((A61F-002/8+ OR A61F-002/9+)/IPC/CPC AND (A61F-2250/006+)/IPC/CPC) AND PRD >= 2014

163 results



Medtronic



POLITECNICO MILANO 1863

Massimo Barbieri - 2018



- Example (Espacenet)
- Classification codes
- Example (Orbit)
- Discussion and conclusions
- Summarizing



Why patent searches are important!

To avoid «reinventing the wheel» (waste of R&D resources)

To avoid infringement of other companies' patents

To write a better patent application

To evaluate the patent portfolio of a company or a university

To find out a potential licensee



Main differences between free of charge and professional databases:

1. Accuracy of data
2. Data coverage
3. Added value information
4. Data update
5. Statistical analysis

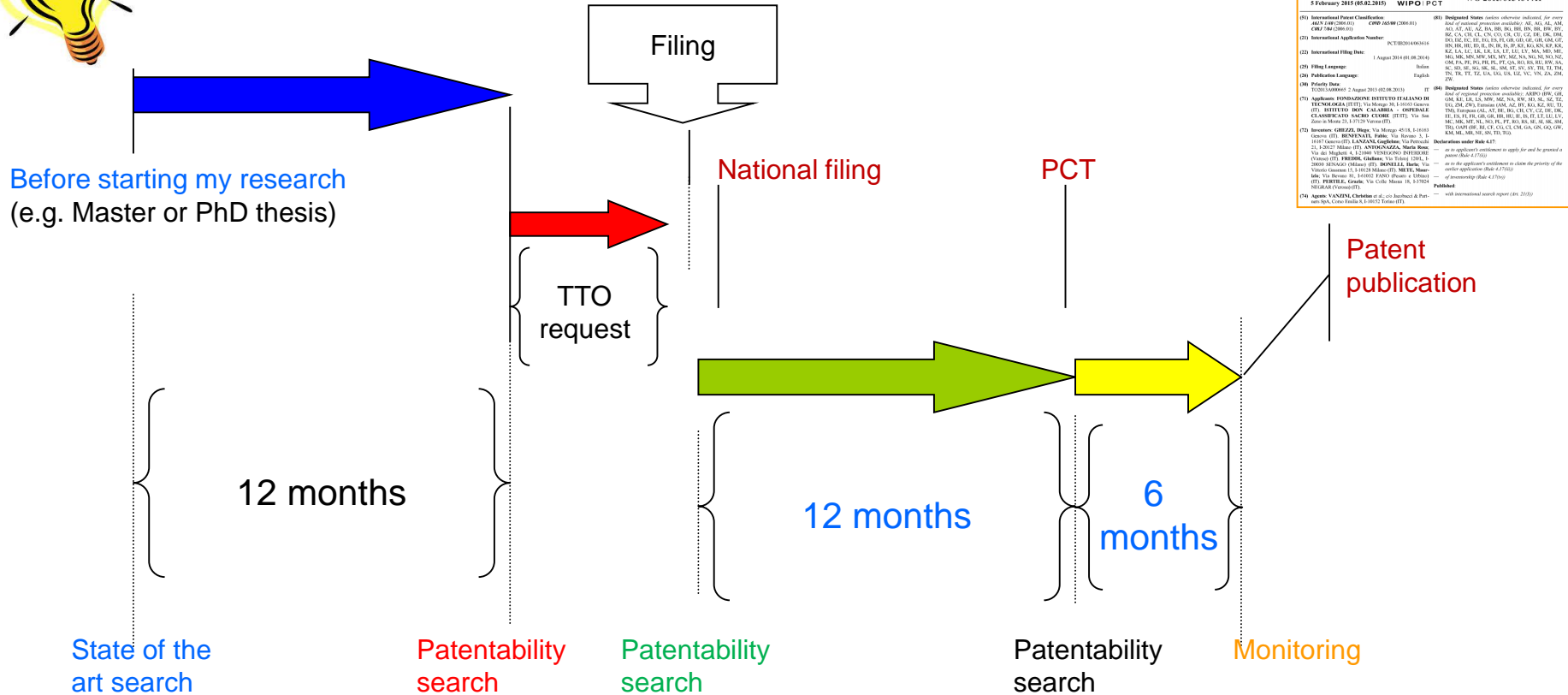
Free of charge patent databases are used for explorative searches, where a complete search is not required.



When do we perform patent searches?



Before starting my research
(e.g. Master or PhD thesis)



During the entire patent procedure



"Freedom to Operate"

Carried out on:

- Granted and active patents in a country,
- pending patent applications and
- PCT patent applications that can be extended in national or regional phases.

Once the patent search is finished, it'll be essential to make a monitoring of patent literature, because patent applications not yet published (at the time of searching) might be relevant and constitute an obstacle to the exercise of a desired industrial activity.

Misses are unacceptable and expected recall is 1!



Types of patent searches (2)

Validity search: it can be seen as *a posteriori* patentability search (the purpose is to determine if a granted patent is indeed valid)

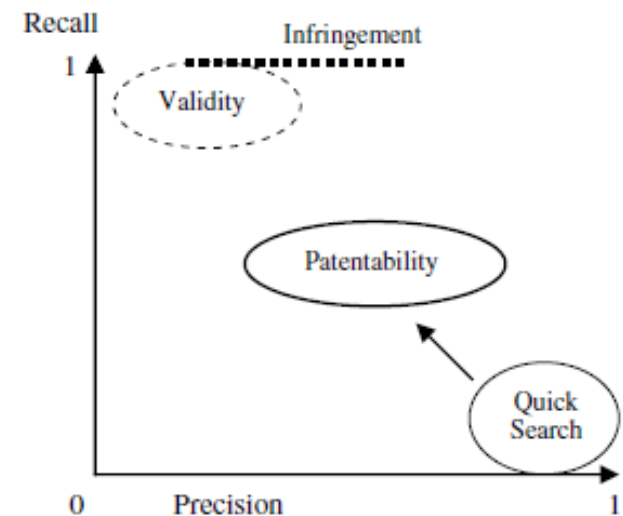
Patentability search (novelty): the purpose is to determine whether an invention is novel and potentially patentable

Informative (or “quick” or state of the art): informative search for R&D planning, technological trends analysis, competitors' monitoring (IPC + KW)

Legal status

FTO searches: recall=1

Informative searches: precision is quite important



Patent searching: how to do it?

Understand the invention: find out the essential technical features

Keywords: identify a set of words (and synonyms)

Classification codes: select one or more classification codes

Citations: check the patent cited and citing the relevant documents

Databases: select one or more databases



Keyword vs. classification codes

KW searches

Classification searches

Hard to find out the right
kw and synonyms

The growing number of
patent documents published
in foreign languages

Language-independent
search tool

A large percentage of
patents contain non-word
information

Classification codes may
describe complex concepts



- Example (Espacenet)
- Classification codes
- Example (Orbit)
- Discussion and conclusions
- Summarizing



- ✓ Combine **CPC classification** codes to **keywords** characterizing the invention
- ✓ Use Boolean Operators (**AND, OR, NOT...**) to refine and enrich the research
- ✓ Use **truncation** symbols (* # ?)
- ✓ Search for **synonyms** and **translation** in foreign languages
- ✓ Analyze the **drawings, title, abstract** and then **claims** and **full text**
- ✓ When you find a relevant patent search for **cited and citing documents**
- ✓ Search on **more than one database.**





massimo.barbieri@polimi.it



@maxbpv9



<https://it.linkedin.com/in/massimo-barbieri-1783677a>

