

DESCRIPTION

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- Front-page information, including title, inventor(s), assignee(s), related applications, classification data, cited references, abstract and front page drawing,
- The full specification of the original patent or published application,
- Claims,
- Drawing sheets and inline images,
- Citing patents,
- Post-issuance legal status information for patents that have been reassigned, reexamined, granted an extended beyond the normal 17/20-year period, expired prior to the normal 17/20-year period, or reinstated after late payment of the maintenance fee,
- The LNU complete patent family for each patent document¹, and
- Legal status information for each member of the patent family¹.

Subject Coverage

United States Patents Fulltext includes all granted U.S. utility patents, published applications, defensive publications, design patents, plant patents, reissue patents, and statutory invention registrations (S.I.R.s).

Date Coverage

1791–present

Update Frequency

Twice a week

Geographic Coverage

U.S. only

Document Types

Patents

Publisher

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¹ The LexisNexis Univentio complete patent family is a group of patents that share at least one common application or priority application number.

TI **Process for preparing nitrooxyalkyl substituted esters of carboxylic acids, intermediates useful in said process and preparation thereof**
 del Soldato, Piero; Santus, Giancarlo; Benedini, Francesca (Inventors). Nicox S.A. (Assignee). **US 7723382 B2**. (Published 25 May 2010). Pricing

Patent Citations Images (27) Family (38 members)

Bibliographic information | Claims | Legal status | Specification

Abstract (summary) [Translate](#)

AB, TX, FT The present invention refers to a process for preparing a compound of general formula (A), as reported in the description, wherein R is a radical of a drug and R1-R12 are hydrogen or alkyl groups, m, n, o, q, r and s are each independently an integer from 0 to 6, and p is 0 or 1, and X is O, S, SO, SO₂, NR₁₃ or PR₁₃ or an aryl, heteroaryl group, said process comprising reacting a compound of formula (B) R—COOZ (B) wherein R is as defined above and Z is hydrogen or a cation selected from: Li⁺, Na⁺, K⁺, Ca⁺⁺, Mg⁺⁺, tetralkylammonium, tetralkylphosphonium, with a compound of formula (C), as reported in the description, wherein R1-R12 and m, n, o, p, q, r, s are as defined above and Y is a suitable leaving group.

3 **Indexing (details)** Cite

PA, CO **Assignee** [Nicox S.A.](#) (Non-US Company)
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Milan, IT
IT (Residence)

INV, AU **Publication number** [US 7723382 B2](#) (25 May 2010)

ICO **Application number** [US 2006522986](#) (13 September 2006)

PBC, PN, KC, PD **Priority number** [IT 2002MI1861](#) (29 August 2002)

APC, APN, APD **Related publication**

Publication type	Publication number	Publication date	Application number	Application date
PCT	WO 2004020385	11 March 2004	WO 2003EP8700	06 August 2003
Related publication	US 20070112194 A1	17 May 2007		

PBC, PN, KC, PD **CPC classification** [C07C 269/06](#) (main); [C07C 67/10](#); [C07C 69/734](#); [C07C 201/02](#); [C07C 203/04](#); [C07C 271/28](#); [C07C 303/28](#)
[More details](#) ▼

APC, APNA, APDA

DT,PBC,PNA,PDA

CPC⁴

²To shorten the display length, the Sample Document shows a portion of the complete Claims, Legal status, Specification, Citations and Family legal status.

³ Clicking on hyperlinked publication and application numbers automatically searches the numbers in all patent databases.

⁴ Clicking on "More details" displays the attribute values assigned to each code; the attribute values are not indexed for searching. This display feature is available for CPC and IPC classifications.

IPC ⁴	IPC classification	Version 8: A61K 31/21 (main); A61K 31/618 (main); A61K 31/40; C07C 69/00; C07C 201/08; C07C 203/04; A61K 31/216; C07B 61/00; C07C 67/10; C07C 69/734; C07C 201/02; C07C 201/04; C07C 203/00; C07C 269/06; C07C 271/28 More details ▼
ECLA	ECLA classification	C07C 269/06; C07C 67/10; C07C 69/734; C07C 201/02; C07C 203/04; C07C 271/28
USCL	US classification	514/509 (main); 514/413; 514/418; 534/660; 558/480; 558/482; 560/129
LA	Publication language	English
--	Application language	English
LRP	Legal representative	Arent Fox LLP (Attorney)
EXM	Examiner	Puttlitz, Karl (examiner) USPTO Art Unit: 1621 Cutliff, Yate' K (assistant examiner)
CLFS	US field of search	514/509; 514/413; 514/418; 558/480; 558/482; 560/129; 534/660
NR,NCP,NCBP	Document features	7 literature citations; 23 cited patents; 2 citing patents 27 12 claims; 9 legal status entries
NOC,NLS	Word count	5841
--	Source attribution	United States Patents Fulltext, © Publisher specific
AN	Accession number	US7723382B2
--	Document URL	http://search.proquest.com/professional/docview/940140071?accountid=160629
FAV	First available	2012-03-25
UD	Updates	2013-01-27 2013-07-09 2013-11-13 2013-12-07 2014-01-29 2014-02-05 2014-07-02 2014-07-10 2014-07-18 2014-07-30
	Database	United States Patents Fulltext

Patent

Citations

 Images (27)

 Family (38 members)

[Bibliographic information](#) | [Claims](#) | [Legal status](#) | [Specification](#)

CLM, TX, FT

The invention claimed is:

1. A process for preparing a compound of general formula (A)

[chemical image]

wherein R_1 - R_{12} are the same or different and independently are hydrogen, straight or branched C_1 - C_6 alkyl, optionally substituted with aryl;

m , n , o , q , r and s are each independently an integer from 0 to 6, and p is 0 or 1, and

X is O, S, SO, SO_2 , NR_{13} or PR_{13} , in which R_{13} is hydrogen, C_1 - C_6 alkyl, or X is selected from the group

consisting of:

saturated or unsaturated C_5 - C_7 cycloalkylene, optionally substituted with one or more straight or branched

C_1 - C_3 alkyl groups;

arylene, optionally substituted with one or more halogen atoms, straight or branched alkyl groups containing from 1 to 4 carbon atoms, or a straight or branched C_1 - C_3 perfluoroalkyl;

a 5 or 6 member saturated, unsaturated, or aromatic heterocyclic ring selected from

[chemical image]

and R is the radical of a pharmacologically active compound selected from the group consisting of:

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LD, LSC, LS

Patent		Citations	Images (27)	Family (38 members)
Bibliographic information Claims Legal status Specification				
Gazette date	Code	Description	Notes/additional information	
2014 Jul 15	US FP -	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	Effective: 2014 May 25	
2014 May 25	US LAPS -	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES		
2014 Jan 03	US REMI	MAINTENANCE FEE REMINDER MAILED		
2010 May 25		Date of publication of document granted on or before said date.		
2006 Dec 01	US AS	ASSIGNMENT	Effective: 2006 Nov 07 Assignee: NICOX S.A., FRANCE CHANGE OF ADDRESS;ASSIGNOR:NICOX S.A.;REEL/FRAME:018700/0268	
2006 Dec 01	US AS	ASSIGNMENT	Effective: 2006 Nov 07 Assignee: <u>NICOX S.A.,FRANCE</u> CHANGE OF ADDRESS;ASSIGNOR: <u>NICOX S.A.</u> ;REEL/FRAME: <u>018700/0268</u>	

REA

PARE

PAOR
RR

TX, FT

Patent		Citations	Images (27)	Family (38 members)
Bibliographic information Claims Legal status Specification				

English:**CROSS-REFERENCE TO RELATED APPLICATION**

This application is a National Stage entry of International Application No. PCT/EP2003/008700, filed Aug. 6, 2003, the entire specification and claims of which are incorporated herewith by reference.

The present invention relates to a process for preparing nitrooxyalkyl substituted esters of carboxylic acids, to intermediates useful in said process and to their preparation.

Many carboxylic acid nitrooxyalkyl esters are pharmacologically active products. For example, 1,4-dihydropyridine derivatives having nitrooxy moieties at the C-3 and/or C-5 ester position have shown to be active calcium-channel blockers similar to nifedipine and nicardipine (J. Chem. Soc. Perkin Trans I, 525 (1993)). In literature, several methods for synthesizing nitrooxyalkyl esters are reported. In this way, the nitrooxy moiety may be for example introduced by nucleophilic substitution of a leaving group already present on the alkyl chain of alkyl ester precursor. In particular, 2-(6-methoxy-2-naphtyl)-propionic acid 4-nitrooxybutyl ester has been synthesized reacting 4-chlorobutyl 2-(6-methoxy-2-naphtyl)-propionate with silver nitrate (WO 95/09831), whereas 2-(benzoylphenyl)propionic acid 4-nitrooxybutyl ester (ketoprofen nitrooxybutyl ester) has been prepared reacting the 2-(3-benzoylphenyl)propionic acid sodium salt with 1,4-dibromobutane to give the corresponding bromobutyl ester, which was then treated with silver nitrate to yield the desired nitrooxy derivative. Both processes have the disadvantage that during the introduction of nitrooxy group, impurities of difficult removal are often obtained, such as silver salts (AgCl, AgBr) and silver metal, this being prejudicial to the use of the end-products in therapeutic field, in which an improved purity is always requested.

A further known process for preparing the above mentioned nitrooxyalkyl esters is the insertion of nitrooxyalkyl group by reacting the carboxylic acid or a derivative thereof (halide) with a nitrooxyalkyl alcohol or with a nitrooxyalkyl bromide. For example, 2-(S)-(6-methoxy-2-naphtyl)-propionic acid 4-nitrooxybutyl ester is prepared treating the corresponding acid chloride with 4-nitrooxybutan-1-ol in methylene chloride and in presence of potassium carbonate (WO 01/10814). This method has also the disadvantage that several by-products are formed, being in fact very difficult to obtain nitrooxyalkyl alcohols and the acyl halide in a pure form; moreover, for example 4-nitrooxybutan-1-ol is stable only in solution and it cannot be isolated as a pure substance.

It was thus an object of the present invention to provide a new process for preparing carboxylic acid nitrooxyalkyl esters not having the above mentioned disadvantages and wherein impurities and by-products

[Cited references](#) | [Citing patents](#)

2 Cited patents

This patent's list of citations includes the patents below (backwards citations).

Cited by other (4 patents)

3
CTPN,PAR,REF

Publication number
WO 95009831 A1
WO 95030641 A
WO 98007701 A
WO 01010814 A1

Cited by examiner (19 patents)

CTINV
CTPN
PAR, REF

Publication number	Publication date	Inventor
US 5700947 A	1997 Dec 23	<u>Soldato</u>
US 5780495 A	1998 Jul 14	Del Soldato
US 5861426 A	1999 Jan 19	Del Soldato et al.
US 6040341 A	2000 Mar 21	Del Soldato et al.

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5 Cited literature

This patent's list of citations includes the literature references below (backwards citations).

Tip: Use the **Look up citation** search form to find these documents, after selecting all databases.

Cited by other (5 references)

NPL, REF

1. Database Online-Chemical Abstracts Service; Movsumzade, et al.; "Effect of Bromine Nitrate on Olefin-Oxirane Mixtures"; 1975.
2. Database Online-Chemical Abstract Service; McKillop, et al.; "Mercury-Assisted Solvolyses of Alkyl Halides. Simple Procedures for the Preparation of Nitrate Esters Acetate Esters, Alcohols, and Ethers"; 1974.
3. Chemical and Pharmaceutical Bulletin; Ogawa, et al.; "Synthesis and Antihypertensive Activities of New 1,4-Dihydropyridine Derivatives Containing Nitrooxyalkylester Moieties at the 3-And 5-Positions"; vol. 41; No. 6; pp. 1049-1054; Jun. 1993.
4. Journal of Medicinal Chemistry, American Chemical Society; Kawashima; "Synthesis and Pharmacological Evaluation of (Nitrooxy)alkyl Apovincaminates"; vol. 36, pp. 815-819; 1993.
5. T. Ogawa et al., "Synthesis and Configurational Assignment of Methyl 3-Nitrooxypropyl 1,4-Dihydro-2,6-dimethyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylate", J. Chem. Soc. Perkin Trans. pp. 525-528, 1993.

⁵ Clicking on hyperlinked journal titles automatically searches the journal title in all general (non-patent) databases.

2

Patent

Citations

Images (27)

Family (38 members)

Cited references | Citing patents

Citing patents (2)

This patent is cited by the patents below (forwards citations).

Publication number	Publication date
US 8062653 B2	2011 Nov 22
US 8303978 B2	2012 Nov 06

CGPN

PAR, REF

6

Patent

Citations

Images (27)

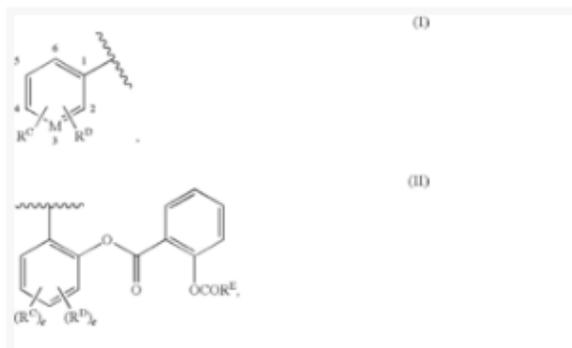
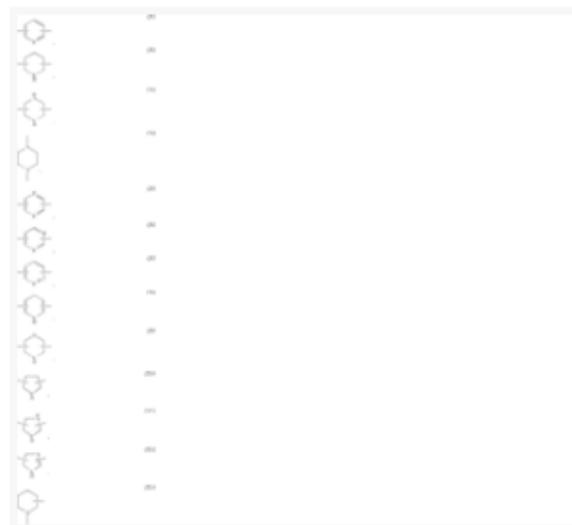
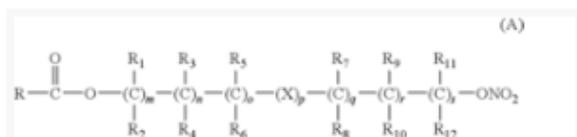
Family (38 members)

Images

Showing 20 of 27 images([Link to PDF for the full patent including all images](#))

Inline images

IMGANY(yes)



⁶ Clicking on an image will launch a full size image viewer.

CFID
FID
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1,3,7

Patent	Citations	Images (27)	Family (38 members)		
Family members (38) Family legal status					
<h3>Complete family</h3> <p>Complete family ID: 160069931 Simple family ID: 133531253 Includes: 38 patents; 20 countries</p>					
Publication number	Kind	Publication date	Application number	Application date	Type
IT 2002MI1861	A1	20040228	IT 2002MI1861	20020829	B
WO 2004020384	A1	20040311	WO 2003EP8698	20030806	
CA 2497187	A1	20040311	CA 2497187	20030806	
WO 2004020385	A1	20040311	WO 2003EP8700	20030806	
AU 2003266966	A1	20040319	AU 2003266966	20030806	
AU 2003266261	A1	20040319	AU 2003266261	20030806	
EP 1532098	A1	20050525	EP 2003747879	20030806	
EP 1537070	A1	20050608	EP 2003790866	20030806	
KR 1020050057057	A	20050616	KR 1020057003509	20030806	
Title		PROCESS FOR PREPARING NITROOXYDERIVATIVES OF NAPROXEN			
Assignee		NICOX S.A. (니콕스 에스. 에이.) 프랑스 에프-06906 소피아 안티폴리 바티몽 I 에스باس 가이마 II 루프 데 돌린느 2455, FR 000-000			
Inventor		DEL SOLDATO PIERO (델 솔다토 피에로) 이탈리아공화국 I-20052 문자 비아 이. 토티 22, IT SANTUS GIANCARLO (산투스 기안카를로) 이탈리아공화국 I-20146 밀라노 비아 주아라 8, IT BENEDINI FRANCESCA (베네디니 프란체스카) 이탈리아공화국 I-20132 밀라노 비아 파도바 286, IT			
Priority number		IT 2002MI1861 (29 August 2002)			
CPC classification		C07C 67/10; C07C 69/734; C07C 201/02; C07C 203/04; C07C 269/06; C07C 271/28			
IPC classification		Version 8: A61K 31/618 (main); C07C 201/08; A61K 31/216; C07B 61/00; C07C 67/10; C07C 69/734; C07C 201/02; C07C 201/04; C07C 203/00; C07C 203/04; C07C 269/06; C07C 271/28 Version 1-7: C07C 201/02 (main); C07C 203/04			
Publication language		Korean			
Document features		9 claims; 1 legal status entries			
Abstract		English: The present invention refers to a process for preparing a compound of general formula (A), wherein R is a radical of naproxen or bromonaproxen and R ₁ -R ₁₂ are hydrogen or alkyl groups, m, n, o, q, r and s are each independently an integer from 0 to 6, and p is 0 or 1, and X is O, S, SO, SO ₂ , NR ₁₃ or PR ₁₃ or an aryl, heteroaryl group, said process comprising reacting a compound of formula (B) : R-COOZ wherein R is as defined above and Z is hydrogen or a cation selected from: Li+, Na+, K+,...			
CN 1678560	A	20051005	CN 2003820605	20030806	

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⁷ The complete set of patent family members for the patent document are displayed in a table (sorted by publication date). To view the bibliographic details of a member, expand the table entry by clicking on the “plus” sign preceding the publication number.
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Patent	Citations	Images (27)	Family (38 members)
Family members (38)		Family legal status	

Legal status - complete family

Patent number	Gazette date	Code	Description	Notes/additional information
RU 2315035 C2	27 Jun 2014	RU MM4A -	THE PATENT IS INVALID DUE TO NON-PAYMENT OF FEES	Effective: 2013 Aug 07
RU 2315035 C2	20 Jan 2008		Date of publication of document granted on or before said date.	
RU 2315035 C2	20 Jan 2008		Publication Of Grant Date	
RU 2315035 C2	20 Nov 2005		Date of publication of unexamined document not granted on or before said date.	
CA 2497187 C	18 Sep 2014	CA MKLA -	LAPSED	Effective: 2014 Aug 06
CA 2497187 C	25 Sep 2012		Date of publication of document granted on or before said date.	
CA 2497187 C	25 Sep 2012		Publication Of Grant Date	
CA 2497187 C	25 Sep 2012		Assignment	Assignee: BENEDINI, FRANCESCA Grantee from 20050815; Reel/Frame: 000000/0000
			.	
			.	
			.	

SEARCH FIELDS

Field Name	Field Code	Search examples ⁹	Description and Notes
Abstract	AB	ab(*ammonium)	Use adjacency and/or Boolean operators to narrow search results.
Abstract present	ABANY	tetralkylphosphonium AND abany(yes)	Add: AND ABANY(YES) to a query to limit retrieval to records with abstracts.
Accession number	AN	an(US7723382B2)	A unique document identification number assigned by the information provider.
All fields	ALL	all(Li Na K Ca Mg)	All fields <i>except</i> the full text. Use proximity and/or Boolean operators to narrow search results.
All fields + text	--	Li AND Na AND K AND Ca AND Mg	Using no field code searches all fields including the full text.
Any number, in many formats	PNUM	pnum(US7723382) pnum(US7723382 B2) pnum(7723382)	Publication, application, priority application, related application, and related publication number. Includes various forms of the number. Search cited and citing publication numbers with CTPN and CGPN.
Application country	APC	apc(us)	Application, priority application, and related application country.
Application date	APD	apd(20060913)	The main application date.

⁸ The complete set of legal status actions for each patent family member are displayed.

⁹ Most, but not all, of the search examples are from the sample record.

Field Name	Field Code	Search examples ⁹	Description and Notes
Application dates – all	APDA	apda(2003-08-06) apda(20030806)	Application, priority, and related application dates.
Application number	APN	apn(US 2006522986)	The main application number.
Application numbers – all	APNA	apna(IT 2002MI1861)	Application, priority application, and related application numbers.
Assignor	PAOR	paor("DEL SOLDATO, PIERO")	An assignor is a former assignee transferring rights to a new assignee (PARE).
Author	AU	au(Santus, Giancarlo)	Author names in patent databases are inventors but can be searched using the AU field code.
Cited and citing patent references	PAR	par(WO 95009831) par(US 7186753) par(Letts)	Cited and citing patent references, but not cited literature.
Cited non-patent literature	NPL	npl(Ogawa) npl("Bromine Nitrate")	Cited literature references.
Cited patent publication date	CTDA	ctda(19971223)	The publication date of a cited patent in the document.
Cited patent publication number	CTPN	ctpn(US 6040341 A) ctpn(6040341) ctpn(US 6040341)	Includes enhanced/variant forms of the number.
Cited references – all	REF	ref(WO98007701) ref(US8062653) ref("Medicinal Chemistry")	Cited/citing patent and cited literature references.
Citing patent publication date	CGDA	cgda(20111122)	The publication date of a citing patent in the document.
Citing patent publication number	CGPN	cgpn(US 8062653 B2) cgpn(US 8062653) cgpn(8062653)	Includes enhanced/variant forms of the number.
Claims	CLM	clm("ferulic acid")	Claims are the legal text describing the patent.
Classification – CPC ¹⁰	CPC	cpc(C07C 69/734) cpc(C07C 69) cpc(C07C) cpc(C07) cpc(C)	The Cooperative Patent Classification (CPC) is available for searching from March 2013 forward.
Classification – ECLA	ECLA	ecla(C07C 201/02) ecla(C07C 201) ecla(C07C) ecla(C07) ecla(C)	European Class codes.
Classification – IPC ¹¹	IPC	ipc(C07C 69/734) ipc(C07C 69) ipc(C07C) ipc(C07) ipc(C)	International Patent Class codes. IPC Version 7 and earlier is used prior to 2006. The IPC Version 8 is used from 2006 forward.
Classification – US	USCL	uscl(514/509) uscl(514)	National Class codes (United States).
Company information	CO	co("Nicox S.A.")	The as-published patent assignee, new assignee and assignor.

¹⁰ The Cooperative Patent Classification (CPC) was introduced in January 2013. It is structurally similar to the International Patent Classification (IPC), so CPC classes are searched the same way using the CPC field code. CPC attributes are the same as the IPC attributes with the exception of the Value attribute (I - Inventive, A - Additional).

¹¹ IPC Version 7 and earlier is used from 1970 through 2005. IPC Version 8 is used from 2006 forward. With the introduction of the Reformed International Patent Classification (IPCR/8) on January 1, 2006, the format of the IPC group increased in length from 3 to 4 digits. For comprehensive retrieval, both forms of the classification codes should be searched. Some records may contain IPCR/8 codes as well as earlier versions of IPC codes, indicating that an older patent has been reclassified. Each IPCR/8 classification code is also assigned a series of attributes. These include classification level (A - Advanced, C - Core, S - Subclass), value (I - Inventive, N - Non-inventive), position (F - First, L - Later), status (B - Basic, R - Reclassified, V - Various, D - Deleted), version date, action date, source (H - Human, M - Machine, G - Generated), and assigning office.

Field Name	Field Code	Search examples ⁹	Description and Notes
Document text	TX	tx("nitrooxyalkyl substituted esters") tx(nitrooxy* NEAR/5 ester?)	Abstract, claims, and specification. Use adjacency and/or Boolean operators to narrow search results. May also search using FT.
Document type	DTYPE	dtype(patent)	The only document type in United States Patents Fulltext is "patent".
Examiner	EXM	exm(Puttlitz, Karl) exm(1621)	Examiner and examiner reference code (USPTO Art Unit). Not available for published applications.
Family ID – complete	CFID	cfid(160069931)	A complete family ID is a type of accession number assigned to any patents that share at least one common application or priority application number.
Family ID – simple	FID	fid(133531253)	A simple family ID is a type of accession number assigned to any patents that share an identical priority application number.
First available	FAV	fav(20120325)	Indicates the first time a document was loaded in a database. It will not change however many times the record is subsequently reloaded.
From database ¹²	FDB	nitrooxy* N/5 ester AND fdb(1008365)	Useful in multi-database searches to isolate records from a single database. FDB cannot be searched on its own; specify at least one search term then AND it with FDB.
Full text	FT	ft("nitrooxyalkyl substituted esters") ft(nitrooxyalkyl substituted esters)	Abstract, claims, and specification. May also search using TX.
Full text present	FTANY	ft(nitrooxyalkyl substituted esters) AND ftany(yes)	Add: <i>AND FTANY(YES)</i> to a query to limit your search to documents with full text (i.e., Specification)
Image present	IMGANY	ft(nitrooxyalkyl substituted esters) AND imgany(yes)	Add: <i>AND IMGANY(YES)</i> to a query to limit your search to documents with an image.
Inventor	INV	inv(Santus, Giancarlo)	May also search inventor names using the AU field code.
Inventor country	ICO	ico(IT)	
Language	LA	la(english)	The language in which the document was originally published.
Language of abstract	SL	sl(english)	
Legal representative	LRP	lrp(Arent Fox)	The legal representative, attorney, agent, or firm who represents the patent assignee.
Legal representative location	LRL	lrl(CA)	The mailing address if available.
Legal status	LS	ls(lapse) ls("US AS") ls(20140715) ls("CONFIDENTIALITY AGREEMENT")	Legal status Gazette date, code, code description, and notes.
Legal status code	LSC	lsc("US AS") lsc(Assignment) lsc(FP) LNK Id(2014)	Legal status code and code description. Use the LNK operator to search legal status data from a specific legal status entry.
Legal status date	LD	ld(201407) ld(20140715)	Legal status Gazette date and effective date in notes.
New assignee	PARE	pare(NICOX)	The name of the patent assignee who is receiving transfer rights from an assignor (PAOR).
Number of cited literature references	NR	nr(>5) nr(7)	NR is a numeric field so using "greater than" (>) and "less than" (<) symbols, for example, is possible.
Number of cited patents	NCP	ncp(23) ncp(22 OR 23 OR 24)	NCP is a non-numeric field; using symbols such as "greater than" (>), "less than" (<) is not possible.
Number of citing patents	NCBP	ncbp(2)	NCBP is a non-numeric field; using symbols such as "greater than" (>), "less than" (<) is not possible.
Number of claims	NOC	noc(1-25) noc(>10)	NOC is a numeric field; using "greater than" (>) and "less than" (<) symbols, for example, is possible.

¹² FDB searches the database ID. Click the "Field codes" hyperlink at the top right of the Advanced Search page. Click "Search syntax and field codes", then click on "FDB command" to get a list of database names and codes that can be searched with FDB.

Field Name	Field Code	Search examples ⁹	Description and Notes
Number of legal status entries	NLS	nls(<=10) nls(1-10)	NLS is a numeric field; using "greater than" (>) and "less than" (<) symbols, for example, is possible.
Patent assignee	PA	pa("NICOX ")	The as-published applicant or patent assignee names.
Patent assignee country	ACO	aco(fr)	The mailing address country for the patent assignee consisting of the ISO-standard 2-letter country code.
Patent publication country	PBC	pbc(us)	The 2-letter ISO standard country code for the main publication and related publication country.
Patent publication country and kind code	KC	kc(us b2) kc(us)	The kind code indicates the publication level of a patent document. KC searches main publication country and kind code, or the country only.
Patent publication country and kind code – all	KCA	kca(US B*) kca(US)	The kind code indicates the publication level of a patent document. KCA searches the main or related publication country with kind code, or the country only.
Patent publication date	PD	pd(20100525) pd(201005)	Main publication date.
Patent publication dates – all	PDA	pda(2010) pda(20040311)	Main and related publication dates.
Patent publication number	PN	pn(US 7723382B2) pn(US 7723382)	Main publication number.
Patent publication numbers – all	PNA	pna(US 7723382) pna(WO2004020385)	Main and related publication numbers.
Patent title	TI	ti(nitrooxyalkyl substituted esters)	
Priority application country	PPC	ppc(it)	The 2-letter ISO-standard country code associated with the priority application number.
Priority application date	PRD	prd(20020829) prd(200208)	The 8-digit date assigned to a priority application number.
Priority application number	PRN	prn(IT 2002MI1861)	The priority application number is the number assigned to the original or first application.
Publication title	PUB	pub(United States Patents Fulltext)	In a patent database, the publication title is generally the database name.
Publication type	PT	pt("Government & Official Publications")	The only publication type in United States Patents Fulltext is "Government & Official Publications".
Reassignment date	RAD	rad(20061201) rad(2006-12-01)	The effective date of a reassignment.
Reassignment information	REA	rea(20050714) rea("NON-COMPT. & CONFIDENTIALITY AGREEMENT") rea(NICOX)	Reassignment effective date, new assignee, assignor, reel/frame, and assignment description.
Reel and frame	RR	rr(016994/0054)	Reel/frame data is available in the legal status.
Related publication and application type	DT	dt(PCT) dt("Related publication")	The type of related publication and application, such as PCT, Continuation in part, etc.
Relevance category	RI	ri(a)	A cited reference may include single letter codes that indicate how it is relevant to the patent.
Specification	SPEC	spec(objet cylindrique)	The specification of the patent. To search all text (abstracts, claims, specification), use the TX or FT field code.

Field Name	Field Code	Search examples ⁹	Description and Notes
Updates	UD	ud(20140730)	The date(s) the record was loaded as a result of an update provided by the supplier.
US field of search	CLFS	clfs(514/509) clfs(514)	Class codes used by examiners for their prior art search report.

SEARCH TOOLS

Field codes are used to search document fields, as shown in the sample document. Field codes may be used in searches entered on the **Basic Search**, **Advanced Search**, **Command Line** and **Look Up Patent** search pages. **Limit options**, **Look up lists**, **Patent families option**, **“Narrow results by” filters**, and **Look up patent** tools are also available for searching. Some data can be searched using more than one tool.

Limit options

Limit options are quick and easy ways of searching certain common concepts. Check boxes are available for: **Full text** and **Images included**.

The Advanced search page also contains a short list of choices for **Patent publication country**, **Language** and dates. **Date limiters** are available in which you can select single dates or ranges for date of **publication**, **priority**, **application**, and **updated**.

Look up lists

Browse the contents of certain fields by using Look up lists. These are particularly useful for validating spellings or the presence of specific data. Terms found in the course of browsing may be selected and automatically added to the Advanced Search boxes. Look up lists are available in the Advanced Search drop-down fields for: **Inventor**, **Patent assignee**, **Patent assignee (reassigned)**, **Patent assignor**, **Publication kind code**, **Classification (CPC)**, **Classification (ECLA)**, **Classification (IPC)**, **Classification (US)** and **Legal status code (LSC)**.

Individual Look Up lists are also available on the Advanced search options form for: **Patent assignee**, **Inventor**, **Classification (IPC)**, and **Publication kind code**

Patent families option

Condense your results to one patent per family by using the patent families search tool on the right-hand panel of the results page. Click “Show one member per family” to reduce the list of results to 1 publication for each patent family. Click “Show all results” to reinstate the full list of results.

“Narrow results by” filters

The results display is accompanied by a list of “Narrow results by” options shown on the right-hand panel. Click on any of these filters to see a ranked list showing the most frequently occurring terms in your results. Click on the term to apply it to (“narrow”) your search results. Narrow results by filters include:

Full text, **Patent assignee**, **Patent assignee country**, **Inventor**, **Patent publication country**, **Publication kind code**, **Classification (IPC)**, **Classification (CPC)**, **Classification (ECLA)**, **Classification (US)**, **Legal status**, **Database** (appears when searching multiple databases), and **Publication date**.

Look up patent

If you need help finding a patent, use the Look Up Patent page to enter any known patent details including: Number, Patent title, Assignee, Inventor, any free-text search terms, Publication date, and Application date.

DOCUMENT FORMATS

Pre-defined document formats are available for viewing and download. Search results can be downloaded with the Download all results, Email, Print and Export/Save options, and when creating an alert.

Each U.S. patents full text document contains the bibliographic data, patent specification, images, claims and legal status of a single patent. In addition, the complete patent family plus legal status data is provided for each family member related to the main patent of the document.

Document format	Description	Online	Export/Download ¹³
Brief view result listing ¹⁴	Original patent title, assignee, inventor, patent number and kind, date, database name.	✓	✓
Detailed view result listing ¹⁴	Brief view plus a 3-line KWIC window, front page drawing, number of citations, number of citing patents, and the number of legal status entries.	✓	
KWIC (Keyword in context)	Detailed view plus all occurrences of your search terms, highlighted within the fields where the terms occur.	✓	✓
Preview ¹⁴	Brief view plus the abstract, front page drawing, IPCs and US class codes.	✓	
Brief citation	Bibliographic information (title, assignee, inventor, publication number and date, application number and date, priority application number and date, related filing details, IPC, CPC, ECLA and US classifications, legal representative, publication and application languages, document features, source attribution, accession number, document URL, update dates, database name), images, patent family members and family legal status	✓	✓
Citation/Abstract	Bibliographic information, abstract, front page drawing, legal status, cited references, images, patent family members and family legal status. A Citation only format is offered when the abstract is not available.	✓	✓
Full text & graphics	The complete document. A Full text only format is offered when images are not available. Clicking on the title in the result listing also provides the complete document.	✓	✓
Custom	Choose the fields you want. To design your own download format, choose the "Custom" format option in the Export/Save menu, and check the fields to be downloaded.		✓
Image of the original patent	A link to the image of the complete patent document in PDF format.	✓	✓

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¹³ Export/download choices include PDF, RTF (Microsoft Word), XLS (Microsoft Excel) and XML. XLS output is only available with a custom format.

¹⁴ Transactional accounts display the title, publication country and the publication date in the brief view, detailed view and preview formats.

