

## USPAT2

<b>Subject Coverage</b>	U. S. Patents and Applications in all areas of technology	
<b>File Type</b>	Full text	
<b>Features</b>	Thesauri	National Patent Classification, Cooperative Patent Classification, International Patent Classification
	<a href="#">Alerts (SDIs)</a>	Every update (twice a week), Weekly, or Monthly (Weekly is the default)
	<a href="#">CAS Registry Number<sup>®</sup> Identifiers</a>	<input checked="" type="checkbox"/> Page Images <input type="checkbox"/> <a href="#">STN<sup>®</sup> AnaVist™</a> <input checked="" type="checkbox"/>
	<a href="#">Keep &amp; Share</a>	<input checked="" type="checkbox"/> <a href="#">SLART</a> <input checked="" type="checkbox"/> <a href="#">STN Easy<sup>®</sup></a> <input checked="" type="checkbox"/>
	Learning Database	<input type="checkbox"/> Structures <input type="checkbox"/>
<b>Record Content</b>	<ul style="list-style-type: none"> <li>• Full text and classifications for the latest publications of U.S. patents and applications issued by the U.S. Patent and Trademark Office since 2001</li> <li>• Patent assignment and reassignment information is available from 2001 – present.</li> <li>• Complete Chemical Abstracts indexing for one equivalent U.S. chemical patent may also be included in a record</li> <li>• Legal status information for U.S. patents since 2001</li> <li>• Patent Classifications: NCL, CPC, IPC</li> </ul>	
<b>File Size</b>	More than 3.4 million records (8/2019)	
<b>Coverage</b>	2001-present	
<b>Updates</b>	<ul style="list-style-type: none"> <li>• Twice a week</li> <li>• U.S. Patent Classifications – updated bimonthly</li> <li>• Cooperative Patent Classifications – updated monthly</li> <li>• International Patent Classifications – updated quarterly</li> </ul>	
<b>Language</b>	English	
<b>Database Producer</b>	U.S. Patent and Trademark Office Office of Data Base Administration Data Maintenance Division 2011 Jefferson-Davis Highway, CP2-9C18 Arlington, VA 22202 USA	
<b>Sources</b>	U.S. patents and applications published by the U.S. Patent and Trademark Office since 2001	
<b>User Aids</b>	<ul style="list-style-type: none"> <li>• Online Helps (HELP DIRECTORY lists all help messages available)</li> <li>• STNGUIDE</li> </ul>	

**Clusters**

- AEROTECH
  - AGRICULTURE
  - ALLBIB
  - ANAVIST
  - AUTHORS
  - BIOSCIENCE
  - CASRNS
  - COMPUTER
  - CONSTRUCTION
  - CORPSOURCE
  - ELECTRICAL
  - ENGINEERING
  - ENVIRONMENT
  - FUELS
  - FULLTEXT
  - GEOSCIENCE
  - HANAVIST
  - HEALTH
  - HPATENTS
  - MATERIALS
  - MEDICINE
  - METALS
  - PATENTS
  - PETROLEUM
  - PHARMACOLOGY
  - PHYSICS
  - PNTTEXT
  - POLYMERS
  - USPATALL
- [STN Database Clusters](#) information (PDF).
- 

**Related Databases**

- USPATFULL
  - USPATOLD
- 

**Pricing**

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## Search and Display Field Codes

Fields that allow left truncation are marked with an asterisk (\*).

Search Field Name	Search Code	Search Examples	Display Codes
Basic Index * (contains single words from the title (TI), abstract (AB), claims (CLM), detailed description (DETD), summary (SUMM), drawing description (DRWD), parent case data (PARN), and government interest (GOVI) fields)	None (or /BI)	S GROWTH REGUL? S NAPHTHALENE? S ?ASSAY?	AB, CLM, DETD, DRWD, GOVI, PARN, SUMM, TI
Abstract * Accession Number Applicant City (Corporate) (13) Applicant Country (Corporate) (13) Applicant Name (Corporate) (13) Applicant State (Corporate) (13) Application Country Application Date (1)  Application Number (2,12)  Application Year (1) Art Unit (1) CAS Registry Number (RN) (CAS data) Claim Text * Classification Code (CAS data) (code and text) (3) Controlled Term (CAS data) Cooperative Patent Classification (5,10) Cooperative Patent Classification, Action Date Cooperative Patent Classification, Combination Sets  Cooperative Patent Classification, Keywords (10) Cooperative Patent Classification, Version Cooperative Patent Initial Classification Disclaimer Date (1,4) Document Type (code and text) Entry Date (1) Examiner Name Examiner's Field of Search  Exemplary Claim Text * Field Availability (code and text)  File Segment Government Interest Index Term (CAS data)  International Patent Classification (Main and Secondary) (5,6)  International Patent Classification, Action Date	/AB /AN /USPA.CTY /USPA.CNY /USPA /USPA.ST /AC /AD  /AP  /AY /ARTU (or /ART) /RN /CLM /CC  /CT /CPC /CPC.ACD  /CPC.CS  /CPC.KW  /CPC.VER  /CPCI /DCD /DT (or /TC) /ED /EXNAM /EXF  /ECLM /FA  /FS /GOVI /IT  /IC  /IPC.ACD	S COBALT CATALYST?/AB S 2001:100195/AN S CAMBRIDGE/USPA.CTY S ARGENTINA/USPA.CNY S GENOMICS/USPA S OH/USPA.ST S US/AC AND L1 S JAN 5 2001/AD S 20010105/AD S US2001-755372/AP S US2013-13642209/AP S 2001/AY S 172/ARTU S 67915-31-5/RN S COBALT (S) SALT#/CLM S 27/CC S HETEROCYCLIC/CC S ANTITUMOR AGENTS/CT S C12N0009/CPC S 20121113/CPC.ACD  S (B29C0066-71 (L) B29K2021-00)/CPC.CS S (B29C0066-71 AND B29K2021-00)/CPC.CS S C04B0028-04/CPC (T) COMBINATION SET/CPC.KW S C12N0009/CPC (S) I/CPC.KW  S 20130101/CPC.VER  S A61K0006-0035/CPCI S 19940111/DCD S UTILITY/DT S L1 AND ED>OCT 23 2001 S ADAMS RUSSELL/EXNAM S 564/EXF S 564/316/EXF S COBALT (S) MIXTURE/ECLM S CA INDEXING/FA S OS/FA S APPLICATION/FS S 93-G-003/GOVI S REACTION OF/IT S 61848-65-5-P/IT S G03C001/IC S G03C001-89/IC S ENZYMES/IC S 20010529/IPC.ACD	AB AN USPA USPA USPA USPA AI AI  AI  AI ARTU IT, RN CLM CC  CT, IT CPC CPC.TAB  CPC.TAB  CPC.TAB  CPC.TAB  CPCI DCD DT Not displayed EXNAM EXF  CLM, ECLM Not displayed  FS GOVI IT  IC  IPC

## Search and Display Field Codes (cont'd)

Search Field Name	Search Code	Search Examples	Display Codes
International Patent Classification, Keyword Terms	/IPC.KW	S INITIAL/IPC.KW	IPC
International Patent Classification, Main (5,6,11)	/ICM	S C07D/ICM S C07D-209/ICM S C07D-209-20/ICM S ENZYMES/ICM	ICM
International Patent Classification, Main Group Range-Searchable (1)	/MGR	S 200-209/MGR	ICM
International Patent Classification, Secondary (5,6,11)	/ICS	S G03C001-76/ICS S ENZYMES/ICS	ICS
International Patent Classification, Subgroup Range-Searchable (1)	/SGR	S 300-400/SGR	IC
International Patent Classification, Version(s) (1)	/IPC.VER	S 7/IPC.VER	IPC, IC
Inventor	/IN (or /AU)	S KRESS ROBERT J?/IN	IN
Inventor Address, City	/IN.CTY	S ROCHESTER/IN.CTY	IN, INA
Inventor Address, Country	/IN.CNY	S JAPAN/IN.CNY	IN, INA
Inventor Address, State	/IN.ST	S NJ/IN.ST	IN, INA
Inventor Address, ZIP code (1)	/IN.ZIP	S 14620/IN.ZIP	IN, INA
Language (code and text)	/LA	S L1 AND EN/LA	LA
Legal Representative (3)	/LREP (or /AG)	S CAMP JASON/LREP	LREP
Line Count (1)	/LN.CNT	S 1000-1500/LN.CNT	LN.CNT
National Patent Classification, Current, Main and Secondary (5,6)	/NCL	S 430529000/NCL S 430/529.000/NCL S 430/NCL S ZEOLITES+NT/NCL	NCL
National Patent Classification, Current, Main (5,6)	/NCLM	S 423121000/NCLM S 423/NCLM S ZEOLITES+NT/NCLM	NCLM
National Patent Classification Current, Secondary (5,7)	/NCLS	S 423206200/NCLS S 423/NCLS S ZEOLITES+NT/NCLS	NCLS
National Patent Classification, Issue, Main and Secondary (5,7)	/INCL	S 264016000/INCL S 264/INCL S ZEOLITES+NT/INCL	INCL
National Patent Classification, Issue, Main (5,7)	/INCLM	S 433173000/INCLM S 433/INCLM S ZEOLITES+NT/INCLM	INCLM
National Patent Classification, Issue, Secondary (5,7)	/INCLS	S 502064000/INCLS S 502/INCLS S ZEOLITES+NT/INCLS	INCLS
Number of Claims (1)	/CLMN	S CLMN>5	CLMN
Other Source	/OS	S 135:218709/OS	OS
Patent Assignee (3)	/PA (or /CS)	S AMERICAN CYANAMID/PA	PA
Patent Assignee Address, City	/PA.CTY	S STAMFORD/PA.CTY	PA
Patent Assignee Address, Country	/PA.CNY	S UNITED KINGDOM/PA.CNY	PA
Patent Assignee Address, State	/PA.ST	S CT/PA.ST	PA
Patent Assignee Address, ZIP code (1, 4)	/PA.ZIP	S 47404/PA.ZIP	PA
Patent Assignee Type	/PAT	S U S CORPORATION/PAT	PAT
Patent Assignee, Original	/PAO	S ABBOTT/PAO	PAO, RAI
Patent Country	/PC	S US/PC AND L2	PI
Patent Kind (8)	/PK	S USB2/PK	PI
Patent Number (2)	/PN	S US6300049/PN	PI
Patent Number/Kind Code	/PNK	S US6300049/PNK	PNK
Priority Country	/PRC	S JP/PRC	PRAI
Priority Date (1)	/PRD	S PRD>=MAR 24 2000 S PRD>=20000324	PRAI
Priority Number (2,9,12)	/PRN	S JP2000-84506/PRN S 2013-60530823/PRN	PRAI
Priority Year (1)	/PRY	S PRY>=2000	PRAI

## Search and Display Field Codes (cont'd)

Search Field Name	Search Code	Search Examples	Display Codes
Publication Date (1)	/PD	S OCT 30 2001/PD	PI
Publication Year (1)	/PY	S PY>=2001	PI
Reassignment Agent	/RAA	S BAKER BOTTS/RAA	RAA, RAI
Reassignment Company	/RAC	S CISCO/RAC	RAC, RAI
Reassignment Country	/RAC.CNY	S AUSTRALIA/RAC.CNY	RAI
Reassignment Date (1)	/RAD	S 20070411/RAD	RAD, RAI
Reassignment Recorded Year (1)	/RARY	S 2010/RARY	Not displayed
Reassignment Execution Date (1)	/RAXD	S 20070411/RAXD	RAXD, RAI
Reassignment Execution Year (1)	/RAXY	S 2011/RAXY	Not displayed
Reassignment Kind	/RAK	S CABLE/RAK	RAK, RAI
Reassignment Update Date (1)	/RAUP	S 20080324	RAUP, RAI
Reference Non-Patent Information	/REN	S SYNTH? CATALYST#/REN	REN
Reference Patent Classification (5,7)	/RPCL	S 338162000/RPCL S 338/162.000/RPCL	REP
Reference Patent Country	/RPC	S L7 AND US/RPC	REP
Reference Patent Inventor	/RPIN	S ABE/RPIN	REP
Reference Patent IPC	/RPIC	S B41J/RPIC S B41J002/RPIC	REP
Reference Patent Number (2)	/RPN	S US1099685/RPN	REP
Reference Patent Publication Date (1)	/RPD	S JUN 1914/RPD	REP
Reference Patent Publication Year (1)	/RPY	S 1914/RPY	REP
Related Application Country	/RLC	S US/RLC	RLI
Related Application Date (1)	/RLD	S MAR 22 2000/RLD	RLI
Related Application Number (2)	/RLN	S US2000-532918/RLN	RLI
Related Application Type	/RLT	S DIVISION OF/RLT	RLI
Related Application Year (1)	/RLY	S RLY<1999	RLI
Related Patent Publication Date (1)	/RLPD	S 2011/RLPD	RLI
Related Patent Number (2)	/RLPN	S US6269207/RLPN	RLI
Related Patent Publication Year (1)	/RLPY	S 1999/RLPY	RLI
Related Publication Indicator	/RLP	S ABANDONED/RLP	RLI
Section Cross-reference (CAS data) (3)	/SX	S 14/CC,SX S PHARMACOLOGY/SX	CC, SX
Supplementary Term (CAS data)	/ST	S POLYURETHANE?/ST	ST
Term of Patent (1, 4)	/PTERM	S 10-15/PTERM	PTERM
Title *	/TI	S FILM?/TI	TI
Update Date (1)	/UP	S L2 AND UP>SEP 2001	Not displayed
Update Date of CA Indexing (1)	/UPCA	S UPCA>=20011030	Not displayed

(1) Numeric search field that may be searched with numeric operators or ranges.

(2) Either STN format or Derwent format may be used.

(3) Search with implied (S) proximity is available in this field.

(4) This is a valid search field, but data is not available as of 11/2001.

(5) An online thesaurus is available for this field.

(6) This field contains the classifications and catchwords for main classification subject headings and subheadings from the (7th) edition of the WIPO International Patent Classifications (IPC) manual. To search the classifications from any of the specific editions (1-8) of the IPC manual, use the field code followed by the edition number, e.g., /IC2, /ICM2, /ICS2 for the 2nd edition. Catchwords are included only in the fields for the 7th, 6th, and 5th editions of the IPC manual.

(7) This field is range-searchable in Manual of Classification order. However, it is not a numeric field and may not be searched using numeric operators.

(8) Available for patent documents published starting in 2001.

(9) U.S. provisional priority numbers are searched only with the P appended, e.g., US1999-121903P/PRN.

(10) When searching combinations of CPC and CPC.KW data, use (S) proximity operator.

(11) These fields have not been populated since December 31, 2005 with the introduction of IPC Reform.

(12) Application numbers for U.S. utility patents from series code 13 forward, design patents (series code 29) and provisional patent applications (series code 60 and 61) may be searched either with or without their series code. Include the series code if known to ensure precision. Note that provisional patent application numbers searched without their series codes must have a P appended to the end of the number (e.g., US2013-686038P). Series code information is not available for U.S. patent application numbers with series codes below 13.

(13) Available for selected patent documents usually from September 2012 or later.

## Super Search Fields

Enter a super search code to execute a search in one or more fields that may contain the desired information. Super search fields facilitate crossfile and multiframe searching. EXPAND may not be used with super search fields. Use EXPAND with the individual field codes instead.

Search Field Name	Search Code	Fields Searched	Search Examples	Display Codes
Cooperative Patent Classification (1)	/CPC	/CPCI, /CPCR	S C12N0009/CPC	CPC, CPCI, CPCR
International Patent Classifications (2,3)	/IPC	/IC, /ICM, /ICS, /IPCI, /IPCR	S G03C/IPC S G03C001/IPC	IPC
International Patent Classifications (Old)	/IPC.OLD	/IC, /ICM, /ICS	S A01B059-00/IPC.OLD	IPC
Application Number Group (1,4)	/APPS	/AP, /PRN, /RLN	S US2001-755372/APPS S US2013-61786274/APPS S US2013-509793/APPS	AI, PRAI, RLI
Patent Applicant/Assignee (5)	/PASS	/PA, /USPA	S BRAUN/PASS	PA, USPA
Patent Country Group	/PCS	/PC, /PC. /RPC, /RPC	S US/PCS	PI, REP, RLI
Patent Number Group (1)	/PATS	/PN, /RLPN, /RPN	S US6300049/PATS	PI, REP, RLI

(1) Either STN format or Derwent format may be used.

(2) A thesaurus is available for this field.

(3) EXPAND and SELECT work with this field.

(4) Application numbers for U.S. utility patents from series code 13 forward, design patents (series code 29) and provisional patent applications (series code 60 and 61) may be searched either with or without their series code. Include the series code if known to ensure precision. Note that provisional patent application numbers searched without their series codes must have a P appended to the end of the number (e.g., US2013-686038P). Series code information is not available for U.S. patent application numbers with series codes below 13.

(5) The /PASS search code only searches the applicant/assignee name portion of the /PA and /USPA fields.

## CPC (/CPC) Thesaurus

The Cooperative Patent Classification (CPC) is jointly developed and maintained by the European Patent Office and the US Patent and Trademark Office. This thesaurus is available in the /CPC search field. All relationship codes can be used with both the EXPAND and SEARCH commands.

Relationship Code	Content	Search Examples
ALL	All usually required terms (BT, SELF, CODE, DEF)	E C12M0001-00+ALL/CPC
AUTO (1)	Automatic relationship (BT, SELF, CODE, DEF)	E G01J003-443+AUTO/CPC
BT	Broader terms (BT, SELF)	E G01J0003-443+BT/CPC
CODE	Classification Code (SELF, CODE)	E CARTRIDGES+CODE/CPC
DEF	Definition (SELF, DEF)	E B65G0045-16+DEF/CPC
HIE	Hierarchy terms (all broader and narrower terms) (BT, SELF, DEF, NT)	E A01B0001-00+HIE/CPC
KT	Keyword terms (SELF, KT)	E LASER+KT/CPC
MAX	All associated terms	E G01J0003-44+MAX/CPC
NEXT	Next classification within the same class (SELF, NEXT)	E A01B0001-24+NEXT/CPC
NEXT(n)	Next n classification within the same class	E A01B0001-24+NEXT3/CPC
NT	Narrower terms	E G05B0001-04+NT/CPC
PREV	Previous Code within the same class (SELF, PREV)	E G05B0019-00+PREV/CPC
PREV(n)	Previous n classifications within the same class	E G05B0019-00+PREV2/CPC
TI	Complete Title of SELF Term and Broader Terms (BT, SELF)	E G05B0001-03+TI/CPC

(1) Automatic Relationship is SET OFF. In case of SET REL ON the result of EXPAND or SEARCH without any relationship code is the same as described for AUTO.

## Thesaurus Fields

A thesaurus is present for the National Patent Classification fields (/INCL, /INCLM, /INCLS, /NCL, /NCLM, /NCLS, /RPCL) and the International Patent Classification fields. The classifications and catchwords for the main headings and subheadings from the 7th edition of the WIPO International Patent Classification (IPC) manual are available in the following fields: /IC, /ICM, /ICS, /IPC, IPCI, and IPCR. The classifications from the previous editions (1-7) are also available as separate thesauri. To EXPAND and SEARCH in the thesauri for editions 1-8, use the field code followed by the edition number, e.g., /IC2, /ICM2, /ICS2 for the 2nd edition. Catchwords are included only in the thesauri for the 8th, 7th, 6th, and 5th editions.

Code	Content	Example
ALL	All associated terms	E 264016000+ALL/INCL
AUTO (1)	Automatic Relationship (BT, SELF)	E A01N025-04+ALL/IPC
ED	Validity Range	E A01N025-04/IC REL=ON
HIE	Hierarchy (Broader and Narrower Terms (all Broader and Narrower Terms) (BT, SELF, NT)	E A01B001-00/ED E 523523000+HIE/NCL E A01B001-06+HIE/IPC
INDEX	IPC Index Terms	E A01B001-00/INDEX
TI	Complete Title of the SELF Term	E 135+TI/NCLM E A01B001-04+TI/IPC
BT	Broader Terms (BT, SELF)	E 423206200+BT/NCLS E A01N029-12+BT/IPC
KT	Keyword Terms (2) (SELF, KT)	E ZEOLITES+KT/NCL
NT	Narrower Terms (SELF, NT)	E 264016000+NT/INCL
NEXT	Next Classification	E A01N025-00+NT/IPC E 135086000+NEXT15/INCL E A01B001-16+NEXT5/IPC
PREV	Previous Classification	E 523523000+PREV3/NCLS E A01B001-18+PREV5/IPC
BRO	Complete Class	E 135019000+BRO5/INCL E A01B003-14+BRO3/IPC
RT	Related Terms	E A01B001-16+RT/IPC

(1) AUTOMATIC relationship is SET OFF. If you SET RELATION ON, the result of EXPAND without any relationship code is the same as described for AUTO.

(2) Keyword terms are the catchwords corresponding to the USPTO Manual of Classifications subject index headings and subheadings.

## DISPLAY and PRINT Formats

Any combination of formats may be used to display or print answers. Multiple codes must be separated by spaces or commas, e.g., D L3 1-10 TI,AB or D L3 1-10 TI AB. The fields are displayed or printed in the order requested.

Hit-term highlighting is available in all fields except DRWN and ECL. Highlighting must be on when a SEARCH is performed to use the FHITSTR, HIT, HITRN, HITSTR, KWIC, and OCC formats.

Format	Content	Examples
AB	Abstract	D 1-3 AB
AI (AP) (1)	Application Information	D 4 9 AI
AN (2)	Accession Number	D AN
ARTU	Art Unit	D L3 5-7 ARTU
CC (SX)	Classification Code and Section cross-reference (CAS data)	D L3 CC 1-5
CLM	Patent Claim Text	D CLM L8
CLM(n) (3)	Patent Claim Text for Claim n	D CLM(2)
CLMN	Number of Claims	D CLMN
CT (2)	Controlled Term (CAS data)	D 4 CT
CPC	Cooperative Patent Classification	D CPC
CPCI	CPC Initial Classification	D CPCI
CPCR	CPC Reclassification	D CPCR
DCD	Disclaimer Date	D L3 6,8 DCD
DETD	Detailed Description	D 1-4 DETD
DRWD	Drawing Description	D L9 DRWD 3-6
DRWN	Number of Drawings	D DRWN
DT (TC)	Document Type	D DT 2,6-10
ECL	Exemplary Claim Number	D 7 L3 ECL
ECLM (3)	Exemplary Claim Text	D 1-5, 10 ECLM
EXF (2)	Examiner's Field of Search	D 1,5,8 EXF
EXNAM	Examiner Name	D EXNAM 4-8,11
FS (2)	File Segment	D FS
GOVI	Government Interest	D 3,5,7 GOVI
ICM (2)	IPC, Main	D 5-6 L1 ICM
ICS (2)	IPC, Secondary	D L4 1-6 ICS
IN (AU)	Inventor (includes INA)	D IN
INA (3)	Inventor Address	D L5 1-4 INA
INCLM (2)	Issue Main National Patent Classification Code	D 2,5 INCLM
INCLS (2)	Issue Secondary National Patent Classification Code	D L2 1-3 INCLS
IPC.F (3)	IPC, First Invention	D IPC.F
IPCI (2,5)	IPC, Initial Classification	D IPCI
IPCR (2)	IPC, Reclassification	D IPCR
IT	Index Term (CAS data)	D 1,5,10 IT
LA (3)	Language	D LA
LN.CNT	Line Count	D LN.CNT
LREP (AG)	Legal Representative	D 2 7 LREP
MFN	Microfilm Frame Number of document at the U.S. Patent and Trademark Office	D MFN
MRN	Microfilm Reel Number of document at the USPTO	D MRN
NCLM (2)	Current Main National Patent Classification Code	D 1-2 NCLM
NCLS (2)	Current Secondary National Patent Classification Code	D 1-5 NCLS
OS	Other Source Chemical Abstracts	D OS
PA (CS)	Patent Assignee (includes PAA and PAT)	D 1-3 PA
PAA (3)	Patent Assignee Address	D 4 9 PAA
PAO	Patent Assignee, Original	D PAO
PARN	Parent Case Data	D L3 5-7 PARN
PAT (3)	Patent Assignee Type	D L3 PAT 1-5
PI (PN) (1)	Patent Information	D PI L8
PNK	Patent Number/Kind Code	D PNK
PRAI (PRN) (1)	Priority Information	D PRAI
PTERM	Term of Patent	D 4 PTERM



**DISPLAY and PRINT Formats (cont'd)**

<b>Format</b>	<b>Content</b>	<b>Examples</b>
RAA RAC RAD RAK RAUP REN REP (RPN) RLI (RLN) (1) RN (3) RNK (6) RNKM (6) ST SUMM TI (2) USPA	Reassignment Agent Reassignment Company Reassignment Date Reassignment Kind Reassignment Update Date Reference Non-Patent Information Reference Patent Information Related Application Information CAS Registry Number (CAS data) Relevance Rank in single file Relevance Rank in multfiles Supplementary Terms (CAS data) Summary of the Invention Title Applicant Name (Corporate)	D RAA D RAC D RAD D RAK D RAUP D L3 6,8 REN D 1-4 REP D L9 RLI 3-6 D RN 2,6-10 D RNK D RNKM D ST D L5 1-4 SUMM D 2,5 TI D USPA
ABS ALL (1)  APPS (1) BIB (1)  CAS CBIB CPC CPC.TAB CPC.UNIQ DALL (1) IABS IALL (1) IBIB (1) IMAX (1) INCL (2) IND  IPC (2,5) IPC.TAB (2,5) IPC.UNIQ IRAI (PA.HIST) ISTD (1) MAX (1)    NCL (2) PATS (1) RAI (LSUS) SBIB (1) SCAN (2,4)	AB AN, TI, IN, USPA, PA, PI, AI, PTERM, DCD, RLI, PRAI, DT, FS, REP, REN, EXNAM, LREP, CLMN, ECL, DRWN, AB, GOVI, PARN, SUMM, DRWD, DETD, CLM, INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPC), EXF, ARTU AI, PRAI, RLI AN, TI, IN, USPA, PA, PI, AI, PTERM, DCD, RLI, PRAI, DT, FS, EXNAM, LREP, CLMN, ECL, DRWN, LN.CNT OS, CC, ST, IT Compressed bibliographic information CPCI, CPCR for the basic patent and patent family members CPC, CPC.KW, CPC.ACD, CPC.VER in tabular format Deduplicated list of CPC codes for the patent family ALL, delimited for postprocessing ABS, with a text label ALL, indented with text labels BIB, indented with text labels MAX, indented with text labels Issue National Patent Classification Code (INCLM, INCLS) INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPC), EXF, ARTU, OS, CC, ST, IT International Patent Classifications (IPC.VER, ICM, ICS, IPCI, IPCR) IPC in Tabular Format Unique IPC codes for a basic and equivalents RAI, indented with text labels STD, indented with text labels AN, TI, IN, USPA, PA, PI, AI, PTERM, DCD, RLI, PRAI, DT, FS, REP, REN, EXNAM, LREP, RAD, RAUP, RAK, PAO, RAXD, RAC, RAA, MRN, MFN, CLMN, ECL, DRWN, AB, GOVI, PARN, SUMM, DRWD, DETD, CLM, INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPCR), EXF, ARTU, OS, CC, ST, IT Current National Patent Classification Code (NCLM, NCLS) PI, REP, RLI RAD, RAXD, RAUP, RAK, PAO, RAC, RAC.CNY, RAA, MRN, MFN AN, TI, IN, USPA, PA, PI, AI, RLI, PRAI, DT, FS, LN.CNT AN, TI, NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPCR) (random answer display, no answer)	D L3 1-5 ABS D 3 ALL  D APPS D BIB  D CAS 3 L2 D CBIB D CPC D CPC.TAB D CPC.UNIQ D 1-15 DALL D 1-4 IABS D IALL 2 D IBIB 4-10 D IMAX 1 D 1,5 L4 INCL D L2 IND 1-4  D 1-4 L2 IPC D IPC.TAB D IPC.UNIQ D IRAI 1, D PA.HIST D ISTD 1,5 D MAX L1 1    D 6,12 L1 NCL D PATS 1-3 D RAI, D LSUS D SBIB D SCAN

## DISPLAY and PRINT Formats (cont'd)

Format	Content	Examples
STD (1) TRIAL (FREE) (2)	AN, TI, IN, USPA, PA, PI, AI, RLI, PRAI, DT, FS, LN.CNT, INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPCR), EXF (STD is the default) AN, TI, INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), IPC (IPC.VER, ICM, ICS, IPCI, IPCR)	D STD 1, 8 D TRIAL
FP (1) FPALL (1) FPBIB (1)	Front page format for: PI, TI, IN, USPA, PA, PTERM, DCD, AI, RLI, PRAI, IPC (IPC.VER, ICM, ICS, IPCI, IPCR), INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), EXF, REP, REN, ARTU, EXNAM, LREP, CLMN, DRWN, AB Front page format for: PI, TI, IN, USPA, PA, PTERM, DCD, AI, RLI, PRAI, IPC (IPC.VER, ICM, ICS, IPCI, IPCR), INCL (INCLM, INCLS), NCL (NCLM, NCLS), CPC (CPCI, CPCR), REP, REN, EXF, ARTU, EXNAM, LREP, CLMN, DRWN, AB, PARN, SUMM, DRWD, DETD, CLM Front page format for: PI, TI, IN, USPA, PA, PTERM, DCD, AI, RLI, PRAI, REP, REN, EXNAM, LREP, CLMN, DRWN	D FP D FPALL L10 1 D 1-10 FPBIB
CPC.HIT (HITCPC) FHITSTR HIT HITIPC (IPC.HIT) HITRN HITSTR KWIC OCC (2)	HIT display of CPC code searched First hit CAS Registry Number, its text modification, its CA index name, and its structure diagram Fields containing hit terms Hit IPC Hit CAS Registry Number and its text modification Hit CAS Registry Number, its text modification, its CA index name, and its structure diagram Up to 20 words before and after hit terms (KeyWord-In-Context) Number of occurrences of hit terms and fields in which they occur	D CPC.HIT or D HITCPC D CBIB FHITSTR D HIT D HITIPC or D IPC.HIT D HITRN D HITSTR D KWIC D OCC

(1) By default, patent numbers, application and priority numbers are displayed in STN format. To display them in Derwent format, enter SET PATENT DERWENT at an arrow prompt. To reset display to STN format, enter SET PATENT STN.

(2) No online display fee for the format.

(3) Custom display only.

(4) SCAN must be specified on the command line, i.e., D SCAN or DISPLAY SCAN.

(5) IPCI-2 is a display label relating to the most recent publication of the patent document. It is part of the IPCI display field.

(6) The RNK and RNKM formats display only the hit term occurrence ranking for the record, with the following line:  
RELEVANCE SCORE ##. RNK is for the single file environment, while RNKM is for the multifile environment.

## Extended DISPLAY and PRINT Formats

Use the extended display formats to display not only the publication from the USPAT2 file, i.e., the latest publication, but also the original publication for the invention from the USPATFULL file.

Format	Content	Examples
BIB.EX	BIB for the latest plus BIB for the original publication	D 1-5 BIB.EX
CLM.EX	CLM for the latest plus CLM for the original publication	DIS L2 CLM.EX
FP.EX	FP for the latest plus FP for the original publication	D FP.EX 1-
IBIB.EX	IBIB for the latest plus BIB for the original publication	D IBIB.EX 1-3 L5
IMAX.EX	IMAX for the latest plus IMAX for the original publication	D IMAX.EX 1
MAX.EX	MAX for the latest plus MAX for the original publication	DISPLAY L1 1 MAX.EX
STD.EX	STD for the latest plus STD for the original publication	D STD.EX L5 3, 6

## Full-Text Browsing

User Request	Example	System Response
DISPLAY BROWSE	=> DISPLAY BROWSE ENTER (L1) OR L#: ENTER (DIS), ANSWER NUMBERS, OR END:	NOVICE version
D BRO  Answer number(s)  Answer number(s) and format Format only *Format  Forward n fields Backward n fields Search forward for a character string  Search backward for a character string  End DISPLAY BROWSE	=> D BRO L1 : :1-3 : :4 HIT :TI TX :*KWIC  :F3 :B1 :S GROWTH REGUL :S :S- ALKANOIC ACID :S- :END =>	EXPERT version  display answers 1, 2, and 3 in default format display next answer in default format display answer 4 in HIT format display title and text of last answer displayed change default to KWIC; no answer displayed move forward 3 fields move backward 1 field search forward within record for 'growth regul' repeat search forward for the current string search backward within record for 'alkanoic acid.' repeat search backward for the current string exit DISPLAY BROWSE and return to => prompt

## SELECT, ANALYZE, and SORT Fields

The SELECT command is used to create E-numbers containing terms taken from the specified field in an answer set.

The ANALYZE command is used to create an L-number containing terms taken from the specified field in an answer set.

The SORT command is used to rearrange the search results in either alphabetic or numeric order of the specified field(s).

Field Name	Field Code	ANALYZE/ SELECT (1)	SORT
Abstract	AB	Y	N
Accession Number	AN	Y	N
Applicant City (Corporate)	USPA.CTY	Y	Y
Applicant Country (Corporate)	USPA.CNY	Y	Y
Applicant Name (Corporate)	USPA	Y	Y
Applicant State (Corporate)	USPA.ST	Y	Y
Application Country	AC	Y (2)	Y
Application Date	AD	Y (2)	Y
Application Information	AI	Y (2,3,4)	Y
Application Number	AP	Y (2,3)	Y
Application Number Group	APPS	Y (2,3,5)	N
Application Year	AY	Y (2)	Y
Art Unit	ARTU	Y	Y
Author (Inventor)	AU	Y (6)	Y
CAS Registry Number (CAS data)	RN	Y (2)	N
Citation	CIT	Y (2,7)	N
Classification Code (CAS data)	CC	Y	Y
Controlled Term	CT	Y (2)	N
CPC Classification	CPC	Y (20)	N
CPC, Initial	CPCI	Y (21)	N
CPC, Reclassified	CPCR	Y (21)	N
CPC Hit Display	CPC.HIT (HITCPC)	Y	Y

**SELECT, ANALYZE, and SORT Fields (cont'd)**

Field Name	Field Code	ANALYZE/ SELECT (1)	SORT
CPC Codes Deduplicated for patent family	CPC.UNIQ	Y	Y
Corporate Source (Patent Assignee)	CS	Y (8)	Y
Current Main National Patent Classification Code	NCLM	Y	Y
Current National Patent Classification Code, Main and Secondary	NCL	Y	Y
Current Secondary National Patent Classification Code	NCLS	Y	N
Detailed Description	DETD	Y (9)	N
Disclaimer Date	DCD	Y	Y
Document Type	DT	Y	Y
Drawing Description	DRWD	Y (9)	N
Examiner Name	EXNAM	Y	Y
Examiner's Field of Search	EXF	Y	Y
Exemplary Claim Text	ECLM	Y	N
Government Interest	GOVI	Y	N
Index Term (CAS data)	IT	Y (2)	N
International Patent Classifications, All codes	IPC	Y (10)	N
International Patent Classifications, Main and Secondary	IC	Y	Y
Inventor	IN	Y	Y
Inventor Address	INA	N	Y
Inventor Address, City	IN.CTY	Y	Y
Inventor Address, Country	IN.CNY	Y	Y
Inventor Address, State	IN.ST	Y	Y
Inventor Address, ZIP Code	IN.ZIP	Y	Y
IPC, First Invention	IPC.F	Y (10)	N
IPC, Main	ICM	Y	Y
IPC, Secondary	ICS	Y	Y
IPC Initial Classification	IPCI	Y (10)	N
IPC Reclassification	IPCR	Y (10)	N
Issue Main National Patent Classification Code	INCLM	Y	Y
Issue National Patent Classification Code, Main and Secondary	INCL	Y	Y
Issue Secondary National Patent Classification	INCLS	Y	N
Language	LA	Y	Y
Legal Representative	LREP	Y	N
	AG	Y (11)	N
Line Count	LN.CNT	N	Y
Number of Claims	CLMN	N	Y
Occurrence Count of Hit Terms	OCC	N	Y
Other Source Chemical Abstracts	OS	Y (2)	N
Other Source Patent Number	OSPN	Y (2,12)	N
Parent Case Data	PARN	Y (9)	N
Patent Assignee	PA	Y	Y
Patent Assignee Address	PAA	N	Y
Patent Assignee Address, City	PA.CTY	Y	Y
Patent Assignee Address, Country	PA.CNY	Y	Y
Patent Assignee Address, State	PA.ST	Y	Y
Patent Assignee Address, ZIP Code	PA.ZIP	Y	Y
Patent Assignee Type	PAT	Y	Y
Patent Assignee, Original	PAO	Y	N
Patent Claim Text	CLM	Y	N
Patent Country	PC	Y (2)	Y
Patent Country Group	PCS	Y (2,13)	Y
Patent Date	PD	Y (2)	Y
Patent Information	PI	Y (2,3,14)	Y
Patent Kind	PK	Y	Y
Patent Number	PN	Y (2,3)	Y
Patent Number/Kind Code	PNK	Y	Y
Patent Number Group	PATS	Y (2,3,15)	Y

**SELECT, ANALYZE, and SORT Fields (cont'd)**

Field Name	Field Code	ANALYZE/ SELECT (1)	SORT
Patent Year	PY	Y (2)	Y
Priority Country	PRC	Y (2)	Y
Priority Date	PRD	Y (2)	Y
Priority Information	PRAI	Y (2,3,16)	Y
Priority Number	PRN	Y (2,3)	Y
Priority Year	PRY	Y (2)	Y
Reassignment Agent	RAA	Y	N
Reassignment Company	RAC	Y	N
Reassignment Country	RAC.CNY	Y	Y
Reassignment Date	RAD	Y	N
Reassignment Execution Date	RAXD	Y	N
Reassignment Kind	RAK	Y	N
Reassignment Update Date	RAUP	Y	N
Reference Patent Classification	RPCL	Y (2)	N
Reference Patent Country	RPC	Y (2)	N
Reference Patent Information	REP	Y (2,3,17)	N
Reference Patent Inventor	RPIN	Y (2)	N
Reference Patent IPC	RPIC	Y (2,3)	N
Reference Patent Number	RPN	Y (2,3)	N
Reference Patent Publication Date	RPD	Y (2)	N
Reference Patent Publication Year	RPY	Y (2)	N
Related Application Country	RLC	Y (2)	N
Related Application Date	RLD	Y	N
Related Application Information	RLI	Y (3,18)	N
Related Application Number	RLN	Y (3)	N
Related Application Type	RLT	Y	Y
Related Application Year	RLY	Y	N
Related Patent Number	RLPN	Y (3)	Y
Related Patent Publication Year	RLPY	Y	N
Section Cross-reference (CAS data)	SX	Y	Y
Summary of the Invention	SUMM	Y (9)	N
Supplementary Term (CAS data)	ST	Y	N
Term of Patent	PTERM	N	Y
Title	TI	Y (default)	Y
Treatment Code	TC	Y (19)	Y

- (1) HIT may be used to restrict terms extracted to terms that match the search expression used to create the answer set, e.g., SEL HIT TI.
- (2) SELECT HIT and ANALYZE HIT are not valid with this field.
- (3) Enter SET PATENT DERWENT at an arrow prompt (=>) to SELECT or ANALYZE patent and application numbers in Derwent format.
- (4) Selects or analyzes the application number with /AP appended to the terms created by SELECT.
- (5) Selects or analyzes AP, PRN, and RLN and appends /APPS to the terms created by SELECT.
- (6) Appends /IN to the terms created by SELECT.
- (7) Extracts patent number, publication year with a truncation symbol appended and with /RE appended to the terms created by SELECT.
- (8) Appends /PA to the terms created by SELECT.
- (9) Appends /BI to the terms created by SELECT.
- (10) Selects or analyzes all codes and appends /IPC to the terms created by SELECT.
- (11) Appends /LREP to the term created by SELECT.
- (12) Appends /PN to the terms created by SELECT.
- (13) Selects or analyzes the PC and RPC and appends /PCS to the terms created by SELECT.
- (14) Selects or analyzes the PN and appends /PN to the terms created by SELECT.
- (15) Selects or analyzes PN, RPN, RLPN and appends /PATS to the terms created by SELECT.
- (16) Selects or analyzes the PRN and appends /PRN to the terms created by SELECT.
- (17) Selects or analyzes the RPN and appends /RPN to the terms created by SELECT.
- (18) Selects or analyzes the RLN and appends /RLN to the terms created by SELECT.
- (19) Appends /DT to the terms created by SELECT.
- (20) Select CPC selects all CPCI and CPCPC classifications and appends /CPC as a field code.
- (21) SELECT appends /CPC.

## Sample Records

### DISPLAY IMAX

ANSWER 1 OF 1 USPAT2 on STN

ACCESSION NUMBER: 2008:355896 USPAT2 [Full-text](#)  
 TITLE: Method and device for aligning a stent with a stent support  
 INVENTOR(S): Park, Sang joon, Waterloo, CANADA  
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 PATENT ASSIGNEE(S): Abbott Cardiovascular Systems Inc., Santa Clara, CA, UNITED STATES (U.S. corporation)  
 ATS Automation Tooling Systems Inc., Ontario, CANADA (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 7606625	B2	20091020
APPLICATION INFO.:	US 2007-764015		20070615 (11)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		

	NUMBER	DATE	CLASS	INVENTOR
REFERENCED PATENT:	US 5630830	May 1997	606/198.000	Verbeek
	US 5897911	Apr 1999		Loeffler
	US 6161029	Dec 2000	600/381.000	Spreigl et al.
	US 6527863	Mar 2003		Pacetti et al.
	US 6575994	Jun 2003	606/198.000	Marin et al.
	US 7390524	Jun 2008	427/002.240	Chen
	US 7402329	Jul 2008		Pacetti et al.
	US 7404979	Jul 2008		Pacetti
	US 20060035012	Feb 2006		Pacetti et al.
	US 20070003688	Jan 2007		Chen et al.
	US 20070073134	Mar 2007	600/407.000	Teichman et al.
	US 20080087474	Apr 2008		Nufer et al.
	US 20080280025	Nov 2008	427/002.240	Scheer
	US 20080307668	Dec 2008		Watterodt et al.
	US 20080311280	Dec 2008		Rego et al.
	US 20080311281	Dec 2008		Andreacchi et al.
	US 20080312747	Dec 2008		Cameron et al.
	US 20080312869	Dec 2008	702/173.000	Hemphill et al.
	DE 10032398	Feb 2001		
	EP 1195584	Apr 2002		
	WO 2007130257	Nov 2007		
NON-PATENT REFERENCE:	U.S. Appl. No. 10/255,913, filed Sep. 26, 2002, Tang et al.			
	U.S. Appl. No. 10/750,312, filed Dec. 30, 2003, Desnoyer et al.			
	U.S. Appl. No. 10/805,047, filed Mar. 18, 2004, Yip et al.			
	U.S. Appl. No. 11/193,849, filed Jul. 28, 2005, Harold et al.			
	International Search Report and the Written Opinion, for PCT/US2008/061806, mailed Dec. 5, 2008, 19 pgs.			
	Invitation to pay additional fees, including communication relating to the results of the partial international search, for PCT/US2008/061806, mailed Aug. 27, 2008, 9 pgs.			

PRIMARY EXAMINER: Patel, Ramesh B  
LEGAL REPRESENTATIVE: Squire, Sanders & Dempsey, L.L.P.

## ASSIGNMENT HISTORY FOR US 7606625

DATE RECORDED: 20090622  
UPDATE DATE: 20091020  
DESCRIPTION: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

PATENT ASSIGNOR(S): ANDREACCHI, ANTHONY S. (DATE EXECUTED: 20090401)  
CHEN, YUNG-MING (DATE EXECUTED: 20090401)  
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GARCIA, ANTONIO (DATE EXECUTED: 20090401)  
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MICROFILM REEL NO: 22858  
MICROFILM FRAME NO: 234 (4 Page(s))

DATE RECORDED: 20090723  
UPDATE DATE: 20091020  
DESCRIPTION: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

PATENT ASSIGNOR(S): ESBECK, THOMAS DAVID (DATE EXECUTED: 20090707)  
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MICROFILM REEL NO: 22998  
MICROFILM FRAME NO: 859 (3 Page(s))

DATE RECORDED: 20090723  
UPDATE DATE: 20091020  
DESCRIPTION: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

PATENT ASSIGNOR(S): PARK, SANG JOON (DATE EXECUTED: 20090708)  
CHOO, SHAULAIN (DATE EXECUTED: 20090619)  
PATENT ASSIGNEE(S): ATS AUTOMATION TOOLING SYSTEMS INC., 250 ROYAL OAK ROAD, CAMBRIDGE, ONTARIO, CANADA

AGENT: SQUIRE SANDERS & DEMPSEY LLP, ONE MARITIME PLAZA, SUITE 300, SAN FRANCISCO, CA 94111

MICROFILM REEL NO: 22998  
MICROFILM FRAME NO: 868 (5 Page(s))

NUMBER OF CLAIMS: 30  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 17 Drawing Figure(s); 16 Drawing Page(s)  
ABSTRACT:

A method for aligning a stent with a stent support includes the steps of (1) placing a stent support and a stent mounted on the stent support in a vertically position with the stent support's first support element at a lower position and the stent support's second support element at an upper position; (2) obtaining a digital image of the stent support and stent; (3) analyzing the digital image of the stent support and stent to compute the vertical position of the stent's upper end; (4) computing a desired position of the second support element based on the position of the stent's upper end; and (5) using a positioning device to move the second support element to the desired position. The movement of the second support element causes the conical sections of the first and second support elements to engage the respective ends of the stent to center the stent around a core element of the stent support and to secure the

**USPAT2**

stent in a longitudinal direction of the stent support.

## FIELD OF THE INVENTION

This invention relates to a method and device for aligning a stent with a stent support.

## BACKGROUND

In the last several years, minimally invasive surgical procedures, such as percutaneous transluminal coronary angioplasty (PTCA), have become increasingly common. A PTCA procedure involves the insertion of a catheter into a coronary artery to position an angioplasty balloon at the site of a stenotic lesion that is at least partially blocking the coronary artery. The balloon is then inflated to compress the stenosis and to widen the lumen in order to allow an efficient flow of blood through the coronary artery.

• • •

Currently there are no efficient and reliable methods to ensure a proper alignment of a stent with a stent support.

## SUMMARY

The method and device of the present invention can reliably, efficiently and precisely mount a stent on a stent support with a proper alignment of the axes of the stent and stent support.

According to one aspect of the invention, a method for aligning a stent with a stent support includes the steps of (1) placing a stent support and a stent mounted thereon in a vertical position with the stent support's first support element at a lower position and the stent support's second support element at an upper position, (2) obtaining a digital image of the stent support and stent, (3) analyzing the digital image of the stent support and stent to compute the vertical position of the stent's upper end, (4) computing a desired position of the second support element based on the position of the stent's upper end, and (5) using a positioning device to move the second support element to the desired position. The movement of the second support element causes the conical sections of the first and second support elements to engage the respective ends of the stent to center the stent around a core element of the stent support and to secure the stent in a longitudinal direction of the stent support.

• • •

According to another aspect of the invention, a device for aligning a stent with a stent support includes a stent support receptacle for receiving a first support element of a stent support to position the stent support in a vertical position, a digital imaging device for imaging a stent mounted on the stent support, a computer, and a positioning device for moving a second support element of the stent support to the desired position. The computer can be used to compute the position of an upper end of the stent from a digital image of the stent support and stent and to compute a desired position of the second support element of the stent support based on the position of the stent's upper end. The computer can also be used to compute stent runout, stent type and stent orientation. In a preferred embodiment, the device for aligning a stent with a stent support further includes a core element support for supporting a free end of a core element of the stent support so that the core element and the first support element are substantially coaxial.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an exemplary device of the present invention for mounting a stent on a stent support in a way that reduces stent runout.

FIG. 2 is a perspective view of a cylindrically-shaped stent.

FIG. 3 is a schematic diagram for a spray coating apparatus.

FIG. 4 is a perspective view of a stent support.



FIGS. 5A and 5B are perspective views showing the conical portions of the first and second support elements of a stent support supporting the ends of a stent.

FIG. 6 is a perspective view of a stent mounted on the core element of a stent support without the second support element of the stent support.

FIG. 7 is a perspective view of a stent mounted on the core element of a stent support with the second support element of the stent support.

FIG. 8 is a perspective view of a stent and a stent support mounted vertically in a stent support receptacle.

FIG. 9 is a perspective view of the free end of a core element being supported by a first core element support.

FIG. 10 is a cross-sectional view of the first core element support.

FIG. 11 is a perspective view of a second core element support.

FIG. 12 is a perspective view of a positioning device.

FIG. 13 is a schematic diagram showing a feedback control loop for controlling the position of the second support element of the stent support.

FIG. 14 is a view of a stent mounted on a stent support with stent runoff.

FIGS. 15 and 16 are perspective views of crowns at a stent end.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

One aspect of the present invention relates to a device for precisely and efficiently mounting a stent on a stent support in a way that reliably reduces stent runoff. FIG. 1 illustrates an exemplary device 10 of the present invention. The device 10 includes a stent support receptacle 12 for receiving a stent support 16 to position the stent support 16 in a vertical position; a digital imaging device 20, such as a digital camera; a computer 14 (FIG. 13); and a positioning device 18. The device 10 may include additional components, as shown in FIG. 1, which will be described hereinafter.

• • •

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications can be made without departing from this invention in its broader aspects. Therefore, the appended claims are to encompass within their scope all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. A method for aligning a stent with a stent support, comprising: placing a stent support and a stent mounted on the stent support in a vertical position with the stent support's first support element at a lower position and the stent support's second support element at an upper position, wherein the lower end of the stent faces a conical portion of the first support element and the upper end of the stent faces a conical portion of the second support element; obtaining a digital image of the stent support and stent; analyzing the digital image of the stent support and stent to compute the vertical position of the stent's upper end; computing a desired position of the second support element based on the position of the stent's upper end; and using a positioning device to move the second support element to the desired position, wherein the movement of the second support element causes the conical portions of the first and second support elements to engage the respective ends of the stent to center the stent around a core element of the stent support and to secure the stent in a longitudinal direction of the stent support.

• • •

29. A device for aligning a stent with a stent support, comprising: a stent support receptacle for receiving a first support element of a stent support to position the stent support in a vertical position; a digital imaging device for imaging a stent mounted on the stent support; a computer connected to the

**USPAT2**

digital imaging device for receiving a digital image of the stent support and the stent mounted thereon, wherein the computer computes the position of an upper end of the stent from the digital image of the stent support and the stent mounted thereon and computes a desired position of a second support element of the stent support based on the position of the stent's upper end; and a positioning device for moving the second support element to the desired position.

30. The device of claim 29, further comprising: a core element support for supporting a free end of a core element of the stent support so that the core element and the first support element are substantially coaxial.

## ISSUE U.S. PATENT CLASSIF.:

MAIN: 700/057.000  
 SECONDARY: 700/056.000; 700/060.000; 700/186.000; 700/192.000;  
 600/374.000; 600/381.000; 623/001.110; 623/001.170

## CURRENT U.S. PATENT CLASSIF.:

MAIN: 700/057.000; 623/001.110  
 SECONDARY: 600/374.000; 600/381.000; 623/001.110; 623/001.170;  
 700/056.000; 700/060.000; 700/186.000; 700/192.000;  
 623/001.150

## COOP. PATENT CLASSIF.:

INITIAL: A61F0002-82 [I]; A61F0002-91; A61F2250-0067;  
 B23K0026-4065 [I]  
 INITIAL-2: A61F0002-82 [I]; A61F0002-91; A61F2250-0067;  
 B23K0026-4065 [I]

## INT. PATENT CLASSIF.:

INITIAL: A61F0002-06 [I]  
 INITIAL-2: G05B0013-02 [I]; A61F0002-06 [I]; G06F0019-00 [N];  
 A61F0005-04 [N]  
 RECLASS: G05B0013-02 [I]; A61F0002-06 [I]; A61F0005-04 [N];  
 G06F0019-00 [N]

FIELD OF SEARCH: 623/1.11; 623/1.15; 623/1.16; 623/1.17; 600/374;  
 600/381; 600/407; 700/56-60; 700/117; 700/159-160;  
 700/186; 700/192; 700/195

ART UNIT: 211

CHEMICAL ABSTRACTS INDEXING COPYRIGHT 2013 ACS on STN

			PATENT	KIND	DATE
OS	CA 150:64178	* WO	2008156920	A2	20081224
	CA 150:41508	US	20080307668	A1	20081218
	CA 150:41507	US	20080311280	A1	20081218
	CA 150:64120	US	20080311281	A1	20081218
	CA 154:192106	US	7885788	B2	20110208
* CA Indexing for this record included					
CA CLASSIF.:	63-7 (Pharmaceuticals)				
SUPPL. TERM:	stent spray coating implant pharmaceutical				
INDEX TERM:	Prosthetic materials and Prosthetics (implants; methods and devices for coating stents)				
INDEX TERM:	Coating materials Coating process Pharmaceutical coatings (methods and devices for coating stents)				
INDEX TERM:	Coating process (spray; methods and devices for coating stents)				
INDEX TERM:	Medical goods Pharmaceutical implants (stents; methods and devices for coating stents)				
INDEX TERM:	9003-63-8, Poly(butyl methacrylate) 9011-17-0, Vinylidene fluoride-hexafluoropropene copolymer (methods and devices for coating stents)				

**DISPLAY CLM.EX**

ANSWER 1 OF 1 USPAT2 on STN

-- Latest Publication -- (GRANTED - B2)

CLM What is claimed is:

1. A method for aligning a stent with a stent support, comprising: placing a stent support and a stent mounted on the stent support in a vertical position with the stent support's first support element at a lower position and the stent support's second support element at an upper position, wherein the lower end of the stent faces a conical portion of the first support element and the upper end of the stent faces a conical portion of the second support element; obtaining a digital image of the stent support and stent; analyzing the digital image of the stent support and stent to compute the vertical position of the stent's upper end; computing a desired position of the second support element based on the position of the stent's upper end; and using a positioning device to move the second support element to the desired position, wherein the movement of the second support element causes the conical portions of the first and second support elements to engage the respective ends of the stent to center the stent around a core element of the stent support and to secure the stent in a longitudinal direction of the stent support.
2. The method of claim 1, further comprising: the step of obtaining the digital image of the stent support and stent includes using a digital imaging device to obtain the digital image of the stent support and stent.
3. The method of claim 1, further comprising: computing stent runout after the step of using the positioning device to move the second support element.
4. The method of claim 3, further comprising: if the computed stent runout is greater than an acceptable limit, lifting the second support element to disengage the second support element from the upper end of the stent.
5. The method of claim 4, further comprising: after the second support element has been disengaged from the upper end of the stent, repeating the step of obtaining a digital image of the stent support and stent; repeating the step of analyzing the digital image; repeating the step of computing a desired position of the second support element; and repeating the step of using the positioning device to move the second support element to the desired position.
6. The method of claim 1, further comprising: obtaining a second digital image of the stent support and stent after the step of using the positioning device to move the second support element; and computing the actual position of the second support element from the second digital image and comparing the actual position of the second support element with the desired position.
7. The method of claim 6, further comprising: if the difference between the actual and desired positions of the second support element exceeds an acceptable limit, using the positioning device to move the second support element to the desired position.
8. The method of claim 1, further comprising: re-seating the stent on the conical portion of the first support element before the step of obtaining the digital image of the stent support and the stent.
9. The method of claim 8, wherein the step of re-seating includes vibrating the first support element.

10. The method of claim 8, wherein the step of re-seating includes striking the first support element.
11. The method of claim 8, wherein the step of re-seating includes lifting the stent off the first support element and releasing the stent.
12. The method of claim 8, wherein the step of re-seating includes tapping on the stent.
13. The method of claim 1, further comprising determining the orientation of the stent from the digital image of the stent support and stent.
14. The method of claim 13, wherein the step of determining the orientation of the stent includes examining crown types at least one stent end.
15. The method of claim 1, further comprising determining the type of the stent from the digital image of the stent support and stent.
16. The method of claim 15, further comprising computing the length of the stent and determining the type of the stent based on the length of the stent.
17. The method of claim 15, further comprising computing the number of end crowns at least one of the stent ends and determining the type of the stent based on the number of end crowns.
18. The method of claim 15, further comprising determining the types of end crowns at least one of the stent ends and determining the type of the stent based on the types of end crowns.
19. The method of claim 15, further comprising: determining the types of end crowns at least one of the stent ends; computing the length of the stent; and determining the type of the stent based on the types of end crowns and the length of the stent.
20. The method of claim 1, wherein the digital image includes the entire outer surfaces of the stent ends.
21. The method of claim 20, further comprising determining the orientation of the stent from the digital image of the stent support and stent.
22. The method of claim 21, wherein the step of determining the orientation of the stent includes examining the end crown types at least one stent end.
23. The method of claim 20, further comprising determining the type of the stent from the digital image of the stent support and stent.
24. The method of claim 23, further comprising computing the length of the stent and determining the type of the stent based on the length of the stent.
25. The method of claim 23, further comprising determining the number of end crowns at least one of the stent ends and determining the type of the stent based on the number of end crowns.
26. The method of claim 23, further comprising determining the types of end crowns at least one of the stent ends and determining the type of the stent based on the types of end crowns.
27. The method of claim 23, further comprising: determining the types of end crowns at least one of the stent ends; computing the length of the stent; and determining the type of the stent based on the types of end crowns and the length of the stent.

28. The method of claim 1, further comprising: supporting a free end of the core element so that the core element and the first support element are substantially coaxial.

29. A device for aligning a stent with a stent support, comprising: a stent support receptacle for receiving a first support element of a stent support to position the stent support in a vertical position; a digital imaging device for imaging a stent mounted on the stent support; a computer connected to the digital imaging device for receiving a digital image of the stent support and the stent mounted thereon, wherein the computer computes the position of an upper end of the stent from the digital image of the stent support and the stent mounted thereon and computes a desired position of a second support element of the stent support based on the position of the stent's upper end; and a positioning device for moving the second support element to the desired position.

30. The device of claim 29, further comprising: a core element support for supporting a free end of a core element of the stent support so that the core element and the first support element are substantially coaxial.

-- Original Publication -- (APPLICATION - A1)

CLM What is claimed is:

1. A method for aligning a stent with a stent support, comprising: placing a stent support and a stent mounted on the stent support in a vertical position with the stent support's first support element at a lower position and the stent support's second support element at an upper position, wherein the lower end of the stent faces a conical portion of the first support element and the upper end of the stent faces a conical portion of the second support element; obtaining a digital image of the stent support and stent; analyzing the digital image of the stent support and stent to compute the vertical position of the stent's upper end; computing a desired position of the second support element based on the position of the stent's upper end; and using a positioning device to move the second support element to the desired position, wherein the movement of the second support element causes the conical sections of the first and second support elements to engage the respective ends of the stent to center the stent around a core element of the stent support and to secure the stent in a longitudinal direction of the stent support.

2. The method of claim 1, further comprising: the step of obtaining the digital image of the stent support and stent includes using a digital imaging device to obtain the digital image of the stent support and stent.

3. The method of claim 1, further comprising: computing stent runout after the step of using the positioning device to move the second support element.

4. The method of claim 3, further comprising: if the computed stent runout is greater than an acceptable limit, lifting the second support element to disengage the second support element with the upper end of the stent.

5. The method of claim 4, further comprising: after the second support element has been disengaged with the upper end of the stent, repeating the step of obtaining a digital image of the stent support and stent; repeating the step of analyzing the digital image; repeating the step of computing a desired position of the second support element; repeating the step of using the positioning device to move the second support element to the desired position.

6. The method of claim 1, further comprising: obtaining a second digital image of the stent support and stent after the step of using the positioning device to move the second support element; and computing the actual position of the second support element from the second digital image and comparing the actual position of the second support element with the desired position.

7. The method of claim 6, further comprising: if the difference between the actual and desired positions of the second support element 46 exceeds an acceptable limit, using the positioning device to move the second support element 46 to the desired position.

8. The method of claim 1, further comprising: re-seating the stent on the conical portion of the first support element before the step of obtaining the digital image of the stent support and the stent;

9. The method of claim 8, wherein the step of re-seating includes vibrating the first support element.

10. The method of claim 8, wherein the step of re-seating includes striking the first support element.

11. The method of claim 8, wherein the step of re-seating includes lifting the stent off the first support element and releasing the stent.

12. The method of claim 8, wherein the step of re-seating includes tapping on the stent.

13. The method of claim 1, further comprising determining the orientation of the stent from the digital image of the stent support and stent.

14. The method of claim 13, wherein the step of determining the orientation of the stent includes examining crown types at at least one stent end.

15. The method of claim 1, further comprising determining the type of the stent from the digital image of the stent support and stent.

16. The method of claim 15, further comprising computing the length of the stent and determining the type of the stent based on the length of the stent.

17. The method of claim 15, further comprising computing the number of end crowns at at least one of the stent ends and determining the type of the stent based on the number of end crowns.

18. The method of claim 15, further comprising determining the types of end crowns at at least one of the stent ends and determining the type of the stent based on the types of end crowns.

19. The method of claim 15, further comprising: determining the types of end crowns at at least one of the stent ends; computing the length of the stent; and determining the type of the stent based on the types of end crowns and the length of the stent.

20. The method of claim 1, wherein the digital image includes the entire outer surfaces of the stent ends.

21. The method of claim 20, further comprising determining the orientation of the stent from the digital image of the stent support and stent.

22. The method of claim 21, wherein the step of determining the orientation of the stent includes examining the end crown types at at least one stent end.

23. The method of claim 20, further comprising determining the type of the stent from the digital image of the stent support and stent.
24. The method of claim 23, further comprising computing the length of the stent and determining the type of the stent based on the length of the stent.
25. The method of claim 23, further comprising determining the number of end crowns at at least one of the stent ends and determining the type of the stent based on the number of end crowns.
26. The method of claim 23, further comprising determining the types of end crowns at at least one of the stent ends and determining the type of the stent based on the types of end crowns.
27. The method of claim 23, further comprising: determining the types of end crowns at at least one of the stent ends; computing the length of the stent; and determining the type of the stent based on the types of end crowns and the length of the stent.
28. The method of claim 1, further comprising: supporting a free end of the core element so that the core element and the first support element are substantially coaxial.
29. A device for aligning a stent with a stent support, comprising: a stent support receptacle for receiving a first support element of a stent support to position the stent support in a vertical position; a digital imaging device for imaging a stent mounted on the stent support; a computer connected to the digital imaging device for receiving a digital image of the stent support and the stent mounted thereon, wherein the computer computes the position of an upper end of the stent from the digital image of the stent support and the stent mounted thereon and computes a desired position of a second support element of the stent support based on the position of the stent's upper end; and a positioning device for moving the second support element to the desired position.
30. The device of claim 29, further comprising: a core element support for supporting a free end of a core element of the stent support so that the core element and the first support element are substantially coaxial.

**DISPLAY BIB.EX**

ANSWER 1 OF 1 USPAT2 on STN

-- Latest Publication -- (GRANTED - B2)

AN 2008:355896 USPAT2 [Full-text](#)  
TI Method and device for aligning a stent with a stent support  
IN Park, Sang joon, Waterloo, CANADA  
Choo, Shaulaine, Cambridge, CANADA  
Andreacchi, Anthony S., San Jose, CA, UNITED STATES  
Chen, Yung-Ming, Cupertino, CA, UNITED STATES  
Currllin, Arnoldo M., San Diego, CA, UNITED STATES  
Garcia, Antonio, San Jose, CA, UNITED STATES  
Van Sciver, Jason, Los Gatos, CA, UNITED STATES  
Esbeck, Thomas David, Murrieta, CA, UNITED STATES  
Glenn, Bryan D., Murrieta, CA, UNITED STATES  
PA Abbott Cardiovascular Systems Inc., Santa Clara, CA, UNITED STATES (U.S. corporation)  
ATS Automation Tooling Systems Inc., Ontario, CANADA (non-U.S. corporation)  
PI US 7606625 B2 20091020  
AI US 2007-764015 20070615 (11)

24

**USPAT2**

DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Patel, Ramesh B  
LREP Squire, Sanders & Dempsey, L.L.P.  
CLMN Number of Claims: 30  
ECL Exemplary Claim: 1  
DRWN 17 Drawing Figure(s); 16 Drawing Page(s)  
LN.CNT 921  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

-- Original Publication -- (APPLICATION - A1)

AN 2008:355896 USPATFULL [Full-text](#)  
TI METHOD AND DEVICE FOR ALIGNING A STENT WITH A STENT SUPPORT  
IN Park, Sang joon, Waterloo, CANADA  
Choo, Shaulaine, Cambridge, CANADA  
Andreacchi, Anthony S., San Jose, CA, UNITED STATES  
Chen, Yung-Ming, Cupertino, CA, UNITED STATES  
Currilin, Arnolando M., San Diego, CA, UNITED STATES  
Garcia, Antonio, San Jose, CA, UNITED STATES  
Van Sciver, Jason, Los Gatog, CA, UNITED STATES  
Esbeck, Thomas David, Murrieta, CA, UNITED STATES  
Glenn, Bryan D., Murrieta, CA, UNITED STATES  
PI US 20080312728 A1 20081218  
US 7606625 B2 20091020  
AI US 2007-764015 A1 20070615 (11)  
DT Utility  
FS APPLICATION  
LREP SQUIRE, SANDERS & DEMPSEY LLP, 1 MARITIME PLAZA, SUITE 300, SAN FRANCISCO, CA, 94111, US  
CLMN Number of Claims: 30  
ECL Exemplary Claim: 1  
DRWN 16 Drawing Page(s)  
LN.CNT 916  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

**DISPLAY STD (Default display format)**

ANSWER 1 OF 1 USPAT2 on STN

AN 2013:359589 USPAT2 [Full-text](#)  
TI Folding mechanism  
IN Li, Jian, Shenzhen, CHINA  
Li, Wu-Qi, Shenzhen, CHINA  
USPA Hong Fu Jin Precision Industry (ShenZhen) Co., Ltd., Shenzhen, CHINA  
Hon Hai Precision Industry Co., Ltd., New Taipei, TAIWAN, PROVINCE OF CHINA  
PA Zhongshan Innocloud Intellectual Property Services Co., Ltd., Guangdong, CHINA (non-U.S. corporation)  
PI US 8978208 B2 20150317  
AI US 2012-13724881 20121221 (13)  
PRAI CN 2012-10176196 20120531  
DT Utility  
FS GRANTED  
LN.CNT 307  
INCL INCLM: 016/342.000  
NCL NCLM: 016/342.000  
CPC CPCI E05D0003-02 [I]  
CPCI-2 E05D0003-02 [I]; E05D0011-105 [I]  
IPC IPCI E05D0003-02 [I]  
IPCI-2 E05D0011-08 [I]; E05D0003-02 [I]; E05D0011-10 [I]  
IPCR E05D0003-02 [I]  
EXF 016/342; 016/340; 016/337-339; 016/303; 016/330; 016/312; 016/314; 016/316; 361/679.08; 361/679.11; 361/679.12; 361/679.27; 455/575.1; 455/575.3



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Internet: [www.stn-international.com](http://www.stn-international.com)

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Internet: [www.jaici.or.jp](http://www.jaici.or.jp)