STN

Patent Classification on STN®

Part II

Jeremias Gromotka

CAS is a division of the American Chemical Society

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STN

Agenda

- Overview of patent classification systems
- International Patent Classification (IPC)
- National/Regional Classification Systems
  - European Classification (ECLA)
  - US National Classification (NCL)
  - Japanese File Index (FI)
  - Japanese File Forming Terms (F-Terms)
- Derwent Classsification
- Chemical Abstracts Classification

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The European Classification ECLA

- Introduced 1975
- Assigned exclusively by the EPO
  - very consistent use
- Extension of the IPC
  - highly detailed
- Assigned to ~30M documents
- Continuously revised and improved
  - Reclassification of existing documents

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ECLA Indexing Philosophy

- Classifying all new inventive concepts, whether claimed or not
  - Emphasis on function rather than application
  - single specific use (application) precedes
- Additional information may be indexed
  - Originally indexed via ECLA
  - Moving toward using ICO for this information

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ECLA Indexing Philosophy

- Classifying all new inventive concepts, whether claimed or not
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  - single specific use (application) precedes
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  - Moving toward using ICO for this information

Thesaurus available soon!

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The European Classification ECLA

- Format
  - IPC + extension

A	NN	A	NNNN	/	NNNNN
Section	Class	Subclass	Group		Subgroup

IPC

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The European Classification ECLA

- Format
  - IPC + extension

A NN A NNNN / NNNNN ananan

Section Class Subclass Group Subgroup extension

IPC

ECLA

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The European Classification ECLA

```
=> s B23K0026-00+NT/epc not B23k0026-00+NT/ipc
         12803 B
         36176 B
L1         647 B23K0026-00+NT/EPC NOT B23K0026-00+NT/IPC

=> d ti hit ipc 1-10

L1   ANSWER 1 OF 647  WPINDEX COPYRIGHT 2010       THOMSON REUTERS on STN
TI   Method of manufacturing mold for optical film used in backlight of
     LCD, involves etching stereostructure in surface of mold using laser
     beam, while changing initial phase of laser beam along transverse
     direction of optical film
EPC  B23K0026-36; B23K0026-40; B23K0026-40B10; B23K0026-40B6C; B29D0011-
     00C6
IPCI B29C0033-38
     [I,C]; B29C
     B29C0059-16
```

Working by laser beam, e.g. welding, cutting, boring (lasers per se H01S3/00) B23K26
B23K26/00

Removing material [N: (laser wire stripping H02G1/12D6; cleaning by laser treatment B08B7/00S2)] [N0102] [C0704] B23K26/36
taking account of the properties of the materials involved [N0102] B23K26/40
[N: Non-metallic material, isolators (B23K26/00F2 and B23K26/00F3 take precedence)] [N0102] B23K26/40B
[N: Brittle material, e.g. ceramics, semi-conductors wafers (laser severing glass C03B33)] [N0607] B23K26/40B6
[N: Ceramic material (note: C04B)] [N0607] B23K26/40B6C

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The European Classification ECLA

```
L1   ANSWER 2 OF 68  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Sealing openings in glass vessels  - esp. the filling holes in liquid
     crystal devices, using laser beam heating
EPC  B23K0026-00F4; C03B0023-20; C03C0027-10; G02F0001-1341
IC   IC C03B019-02; C03C027-00; G02F001-13; G09F013-24
                  [N: Non-metallic material, isolators (B23K26/00F2 and B23K26/00F3 take precedence)]  B23K26/00F4

L1   ANSWER 3 OF 68  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Integrated circuit fabrication method for VLSI design, involves
     heating wafer with laser beam at selected locations
EPC  B23K0026-00F3; B23K0026-00J; B23K0026-08B; B23K0026-12; B23K0026-40B6
IPCR H01L0021-02 [I,C]; H01L0021-31 [I,A]
                  [N: Semiconducting material]  B23K26/00F3

L1   ANSWER 4 OF 68  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Surgical apparatus for treating biological hard tissues e.g. dentin of
     tooth, includes thulium doped fiber laser having active region to…
EPC  A61C0001-00L; B23K0026-00F2
IPCI A61C0001-00 [I,A]; A61C0001-00 [I,C]
                  [N: Biological or living material]  B23K26/00F2
```

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The European Classification ICO

- In Computer Only
  - Internal EPO indexing tool
  - Introduced in the mid-1990s
- 'ECLA for side aspects'
  - Used for minor aspects
  - Same as the ECLA + experimental codes
    - For characteristics not covered by ECLA codes
  - Only in combination with ECLA
  - Non-obligatory

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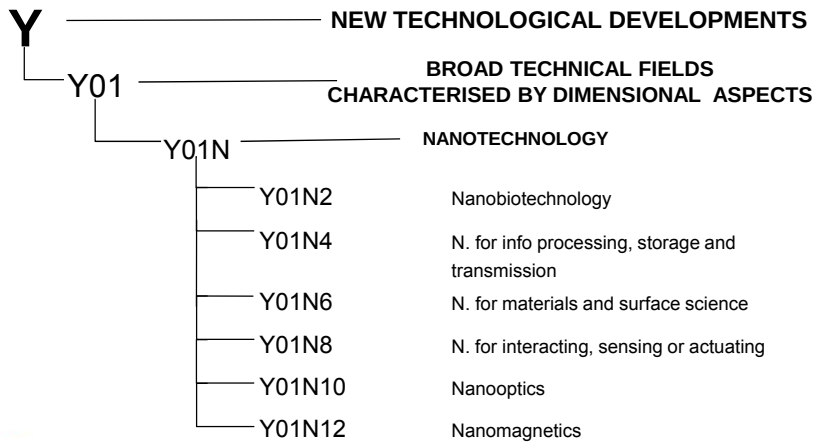
The European Classification ICO – Experimental Codes



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The European Classification ICO

- Format
  - ECLA, section codes shifted

A → K
B → L
C → M
D → N
E → P
F → R
G → S
H → T

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The European Classification ICO

```
=> s L23K0026-00?/ico not B23K0026-00?/ecla
            37 L23K0026:00?/ICO
           961 B23K0026-00?/ECLA
L1          37 L23K0026:00?/ICO NOT B23K0026-00?/ECLA

=> d ti ecla hit
L1   ANSWER 1 OF 37  WPINDEX COPYRIGHT 2009   THOMS
TI   Welding of nickel-base superalloy castings e.g. turbine component…
EPC  B23K0035-00B4; B23K0035-30F2
ICO  L23K0015:00; L23K0026:00; L23K0101:00B


L1   ANSWER 2 OF 37  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Electrical semiconductor circuits mfr.  - includes using an
     intermediate metallised layer between ceramic base and metal contact…
EPC  C04B0037-02B; C04B0037-02D4; H01L0023-498L
ICO  L23K0026:00C
```

An ICO-thesaurus will be available soon!

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Agenda

- Overview of patent classification systems
- International Patent Classification (IPC)
- National/Regional Classification Systems
  - European Classification (ECLA)
  - US National Classification (NCL)
  - Japanese File Index (FI)
  - Japanese File Forming Terms (F-Terms)
- Derwent Classsification
- Chemical Abstracts Classification

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STN

The United States Patent Classification

- Dates back to 1830
- Used by the USPTO
  - very consistent use
- Hierarchical, non-expressive
- Consists of ~450 classes and ~150,000 subclasses
- Patent documents revised and reclassified at regular intervals

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USPC Indexing Philosophy

- Application-oriented system
- 'Main' and 'secondary' classification levels
- Three main disciplines
  - chemical, electrical, mechanical
- Classes are mutually exclusive – no overlaps

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The United States Patent Classification

- Format
  - numerical code(*)

NNN / NNN . NNN (AA)

Class Subclass (Alpha-Subclass)

(* letters are used to denote alpha subclasses and digests)

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STN

The United States Patent Classification Digests

- Format
  - numerical code, leading ‘DIG’-identifier for subgroup

NNN / DIG . NNN

Group Subgroup

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STN

The United States Patent Classification Thesaurus

```
=> E 219121630/NCL 5
E#   FREQUENCY    AT     TERM
--   ---------    --     ----
E1         143     3     219121610/NCL
E2          56     2     219121620/NCL
E3         261     3 --> 219121630/NCL
E4         419     2     219121640/NCL
E5         127     3     219121650/NCL

=> E E3+ALL
E1       11703   BT4   219/NCL
                       ELECTRIC HEATING
E2         142   BT3   219050000/NCL
                       METAL HEATING (E.G., RESISTANCE HEATING)
E3          99   BT2   219121110/NCL
                       .BY ARC
E4         389   BT1   219121600/NCL
                       ..USING LASER
E5         261   -->   219121630/NCL
                       ...WELDING
E6         419   NT1   219121640/NCL
                       ....METHODS
********** END **********
```

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The United States Patent Classification Thesaurus

```
=> S E5+NT
L3        1417 219121630+NT/NCL  (2 TERMS)

=> D TI 1-5

L3   ANSWER 1 OF 1417  WPINDEX COPYRIGHT 2010       THOMSON REUTERS ON STN
TI   INTEGRAL LENS SHEET FORMATION FOR PHOTOVOLTAIC SOLAR CELL SUBASSEMBLY, BY
     POSITIONING INDIVIDUAL LENSES OVER RESPECTIVE APERTURES FORMED IN PARQUET
     PART, AND LASER WELDING INDIVIDUAL LENSES TO PARQUET PART BY FORMING LASER
     WELD

L1   ANSWER 2 OF 1417  WPINDEX COPYRIGHT 2010       THOMSON REUTERS ON STN
TI   LASER SOLDERING METHOD FOR SOLDERING E.G. INTEGRATED CIRCUIT ONTO PRINTED
     CIRCUIT BOARD, INVOLVES FUSING WIRE SOLDER AND SOLDER PASTE TO SOLDER ROD
     TERMINAL OF ELECTRONIC COMPONENT AND RING-SHAPED TERMINAL AT PRINTED
     CIRCUIT BOARD

L1   ANSWER 3 OF 1417  WPINDEX COPYRIGHT 2010       THOMSON REUTERS ON STN
TI   GAP CONTROL DEVICE USED WITH LASER WELDING DEVICE TO WELD OBJECTS TO EACH
     OTHER COMPRISES LASER GUIDE, GAP HOLDER TO FORM PREDETERMINED GAP BETWEEN
     OBJECTS AT A PART OF FOCUSING POSITION, AND PRESS

L1   ANSWER 4 OF 1417  WPINDEX COPYRIGHT 2010       THOMSON REUTERS ON STN
TI   VEHICLE STRUCTURE I.E. LASER WELDED DOOR, MANUFACTURING METHOD, INVOLVES…
```

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  - Japanese File Forming Terms (F-Terms)
- Derwent Classsification
- Chemical Abstracts Classification

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The Japanese File Index

- Introduced in 1980 as JPO-internal system
  - based on IPCv4 (extension)
  - revised 2006 for better compliance with IPCv8
  - ~192k symbols
- Assigned to claimed content
  - to all Japanese patents and utility models
  - by the IPCC
- Additional disclosed content may be indexed
  - technology, uses, chemical substances

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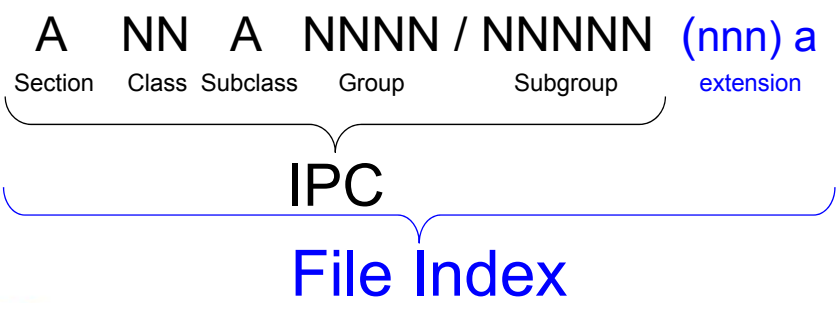
The Japanese File Index

- Format
  - IPC + extension



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The Japanese File Index

```
=> s B23K0026-00?/jpc not B23K26-00+NT/ipc
          9699 B23K0026-00?/JPC
         35405 B23K26-00+NT/IPC  (25 TERMS)
                (B23K0026-00+NT/IPC)
L1          37 B23K0026-00?/JPC NOT B23K26-00+NT/IPC

L1   ANSWER 1 OF 37  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Welding using radiation energy
IPCR B23K0015-00 [I,A]; B23K0015-00 [I,C]; B23K0020-04 [I,A]; B23K0020-04
FCL  B23K0015-00 501 B; B23K0026-00 310 F

L1   ANSWER 2 OF 37  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Impurity-doped semiconductor laser for single wavelength oscillation
     - uses dispersion of wavelengths in rare-earth-element-impurities…
IPCR H01L0021-02 [I,C]; H01L0021-205 [I,A]; H01S0005-00 [I,A]; H01S0005-00
     [I,C]; H01S0005-16 [I,A]; H01S0005-227 [I,A]; H01S0005-30 [I,A];
     H01S0005-323 [N,A]
FCL  B23K0026-00 310 P; B23K0026-10; B23K0009-00 501 S; G21C0021-00 A;
     G21C0021-02 A; H01L0021-205; H01S0003-18; H01S0005-0
```

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- Derwent Classsification
- Chemical Abstracts Classification

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The Japanese F-Terms

- Introduced in 1987 as JPO-internal system
  - for additional indexing
  - for all disclosed aspects
- Designed for electronic (boolean-logic) retrieval
  - never assigned alone
- Designed for use with keywords, FI and IPC
  - not fully elaborated for areas sufficiently covered by FI / IPC
- Printed on publications since 1999

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The Japanese F-Terms concept

- Coverage of the IPC split in ~2800 themes
  - based on FI (IPCv4)
- Themes are subdivided in terms (viewpoints)
  - use, purpose, material, preparation, process, control, structure…
- Over 350k term codes (symbols)
- Assigned by the IPCC
  - to Japanese documents only
- Thesaurus available

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The Japanese F-Terms

- Format
  - Alphanumerical code

NANNN / AA NN

theme aspect figure

(viewpoint)

term

File Forming Term

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Utilizing the FTERM-Thesaurus in WPINDEX

- The new F-Term-Thesaurus allows you to:
  - find suitable classification symbols
  - search using Relationship Codes
  - search using Boolean Logic (AND, OR, NOT)
  - identify related File Index symbols

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e capsule/fterm
E#   FREQUENCY    AT     TERM
--   ---------    --     ----
E1           0     1     CAPSULATED CONFIGURATIONS
                         (E.G.MICROCAPSULES)/FTERM
E2           0     1     CAPSULATION/FTERM
E3           0     1 --> CAPSULE/FTERM
E4           0     1     CAPSULE CONFIGURATIONS/FTERM
E5           0     1     CAPSULE MANUFACTURE USING C
E6           0     1     CAPSULE MATERIALS/FTERM
E7           0     1     CAPSULE POLYSACCHARIDES/FTERM
E8           0     1     CAPSULE PREPARATIONS/FTERM
E9           0     1     CAPSULE SEALING/FTERM
E10          0     1     CAPSULE SHELLS/FTERM
E11          0     1     CAPSULE STRUCTURES (E.G., DOUBLE WALLS)/FTERM
E12          0     1     CAPSULE TENSORS/FTERM

=> e e8+kt
E1           0   -->  Capsule preparations/FTERM
E2        2738        4C076/AA53/FTERM
********** END **********
```

We're looking for capsule formulations

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e e2+all
E1       33395   BT2  4C076/FTERM
                      Medicinal preparations
E2           4   BT1  4C076/AA00/FTERM
                      forms
E3        2738   -->  4C076/AA53/FTERM
                      Capsule preparations
E4         921   NT1  4C076/AA54/FTERM
                      Hard capsules
E5         158   NT2  4C076/AA55/FTERM
                      Capsules that contain emulsions, dispersions,or liquids
E6         706   NT1  4C076/AA56/FTERM
                      Soft capsules
E7          78   NT2  4C076/AA57/FTERM
                      Seamless capsules
E8         263   NT1  4C076/AA58/FTERM
                      Capsule materials
E9          22   NT1  4C076/AA59/FTERM
                      Finishing, coloring, or glazing of capsules
E10        239   NT1  4C076/AA60/FTERM
```

The Theme is 'Medicinial Preparations'

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Utilizing the FTERM-Thesaurus in WPINDEX

```
                        Coated capsules
E11       1029    NT1   4C076/AA61/FTERM
                        microcapsules
E12        124    NT2   4C076/AA62/FTERM
                        Shape or structure of microcapsules
E13        173    NT3   4C076/AA63/FTERM
                        Microcapsules that have multilayer structures
E14        533    NT2   4C076/AA64/FTERM
                        Characteristic capsule materials
E15        406    NT2   4C076/AA65/FTERM
                        Nanocapsules
E16        176    NT2   4C076/AA66/FTERM
                        Microcapsules that contain emulsions, dispersions, or
                        liquids
E17        566    NT2   4C076/AA67/FTERM
                        Providing for continuous or gradual release
********** END **********
```

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Utilizing the FTERM-Thesaurus in WPINDEX

- The new F-Term-Thesaurus allows you to:
  - find suitable classification symbols
  - search using Relationship Codes
  - search using Boolean Logic (AND, OR, NOT)
  - identify related File Index symbols

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Utilizing the FTERM-Thesaurus in WPINDEX

```
                    Coated capsules
E11       1029   NT1  4C076/AA61/FTERM
                      microcapsules
E12        124   NT2  4C076/AA62/FTERM
                      Shape or structure of microcapsules
E13        173   NT3  4C076/AA63/FTERM
                      Microcapsules that have multilayer structures
E14        533   NT2  4C076/AA64/FTERM
                      Characteristic capsule materials
E15        406   NT2  4C076/AA65/FTERM
                      Nanocapsules
E16        176   NT2  4C076/AA66/FTERM
                      Microcapsules that contain emulsions, dispersions, or
                      liquids
E17        566   NT2  4C076/AA67/FTERM
                      Providing for continuous or gradual release
********** END **********

=> s e11+NT
L1        2311 4C076/AA61+NT/FTERM  (7 TERMS)
```

We opt for microcapsules.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> d ti 1-5
L1   ANSWER 1 OF 2311  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Protein enclosure type bio-nanocapsule useful in drug delivery,
     comprises target protein e.g. cytokine enclosed in particle ...

L1   ANSWER 2 OF 2311  WPINDEX COPYRIGHT 2
TI   Protein nanoparticle, useful in a wat
     alleviating skin irritation, for trea

L1   ANSWER 3 OF 2311  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Making temperature-sensitive nano-carrier used to deliver protein
     involves adding initiator to dispersion of water-soluble ...

L1   ANSWER 4 OF 2311  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Microsphere formulation for preventing or treating diseases in human
     or animal subject, contains bioactive polypeptide or protein ...

L1   ANSWER 5 OF 2311  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   New sustained release composition without retarded time comprises
     polymer, bioactivator and release-rate control agent, useful for
```

Keyword searching would have been difficult in this case.

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Utilizing the FTERM-Thesaurus in WPINDEX

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> s 4C076/AA61+NT/fterm and (4C084/NA08 or 4C084/ZA08 or 4C086/NA08 or
     4C086/ZA08 or 4C087/NA08 or 4C087/ZA08 or 4C206/NA08 or
     4C206/ZA08)/fterm
          2311 4C076/AA61+NT/FTERM  (7 TERMS)
           135 4C084/NA08/FTERM
          2359 4C084/ZA08/FTERM
           299 4C086/NA08/FTERM
          9397 4C086/ZA08/FTERM
             9 4C087/NA08/FTERM
           262 4C087/ZA08/FTERM
           168 4C206/NA08/FTERM
          3407 4C206/ZA08/FTERM
L2         150 4C076/AA61+NT/FTERM AND (4C084/NA08 OR 4C084/ZA08 OR
               4C086/NA08 OR 4C086/ZA08 OR 4C087/NA08 OR 4C087/ZA08 OR
               4C206/NA08 OR 4C206/ZA08)/FTERM

=> d ti

L2   ANSWER 1 OF 150  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Sustained-release formulation for treating pain, is a microsphere
     which contains calcitonin, and is formed from in-vivo degradable
```

These additional Fterms cover analgetics.

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Utilizing the FTERM-Thesaurus in WPINDEX

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  - find suitable classification symbols
  - search using Relationship Codes
  - search using Boolean Logic (AND, OR, NOT)
  - identify related File Index symbols

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e 4C076+RFI/fterm
E1       33395   -->  4C076/FTERM
                 RFI  A61K9/00-9/72;47/00-47/48
********** END **********

RFI  A61K9/00-9/72;47/00-47/48 means:

         A61K0009/00 to A61K0009/72
                    and
         A61K0047/00 to A61K0047/48

=> e A61K0009/ipc
...
         A61K0009-48/IPC
         . Preparations in capsules, e.g. of gelatin, of chocolate
         A61K0009-50/IPC
         . . Microcapsules (A61K0009-52 takes
         A61K0009-51/IPC
         . . . Nanocapsules
```

The Relationship Code +RFI is available for Themes only.

Definitions for IPC and FI are not necessarily identical! They are in this case, though.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> s A61K0009-48+NT/ipc or (A61K0009-48? or A61K0009-5? or A61K0009-60? or
     A61K0009-62? or A61K0009-64? or  A61K0009-66?)/jpc
         25176 A61K0009-48+NT/IPC  (11 TERMS)
          2884 A61K0009-48?/JPC
          2167 A61K0009-5?/JPC
            19 A61K0009-60?/JPC
           144 A61K0009-62?/JPC
            45 A61K0009-64?/JPC
            49 A61K0009-66?/JPC
L3        25214 A61K0009-48+NT/IPC OR (A61K0009-48? OR A61K0009-5? OR
                A61K0009-60? OR A61K0009-62? OR A61K0009-64? OR  A61K0009-
                66?)/JPC

=> d ti

L3   ANSWER 1 OF 25214  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
TI   Capsule compound and the manufacturing method of the same - capable of
     prolonging the swollen condition of capsule for long period of time
     inside the container without being dried and shrinked
```

There is no FI-Thesaurus available yet.

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Utilizing the FTERM-Thesaurus in WPINDEX

- Broader concept or widely used terms can not be easily researched in the thesaurus using keywords.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e led/fterm

E#   FREQUENCY    AT     TERM
--   ---------    --     ----
E1           0     1     LECTIN/FTERM
E2           0     1     LECTINS/FTERM
E3           0     4 --> LED/FTERM
E4           0     1     LED DIRECTLY ATTACHED ONTO SUBSTRATES/FTERM
E5           0     1     LED EL (FOR BLINKING, SEE HD02)/FTERM
E6           0     1     LED LIGHT-EMITTING DIODES/FTERM
E7           0     0     LED LIKE/FTERM
E8           0     1     LED SHUTTERS, E.G. LIQUID CRYSTAL/FTERM
E9           0     0     LED, E.G., LIQUID CRYSTAL DISPLAYS/FTERM
E10          0     0     LED, SEE ALSO AH44 AF45/FTERM
E11          0     0     LEDGE/FTERM
E12          0     0     LEDGER/FTERM
```

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e e3+kt
E1           0   -->  LED/FTERM
E2         106        2C262/GA38/FTERM
E3         848        2F103/EB06/FTERM
E4         232        5G019/JJ08/FTERM
E5        1253        5K102/PB02/FTERM
E6           0   KT   Articles placed between fibers light-emitting diodes
                      (LED)/FTERM
E7           0   KT   Bonding molding to light-emitting diode (LED)
                      chips/FTERM
E8           0   KT   Bonding to molding onto light-emitting diode (LED)
                      chips/FTERM
E9           0   KT   Bulb-type light-emitting diodes (LED)/FTERM
E10          0   KT   Characteristic products after finished light-emitting
                      diodes (LED) are mounted/FTERM
E11          0   KT   DRIVE CIRCUITS LIGHT-EMITTING DIODES (LED)/FTERM
E12          0   KT   Devices mounting finished light-emitting diodes
                      (LED)/FTERM
E13          0   KT   Display devices light emitting diodes (LED)/FTERM
E14          0   KT   FORMS LIGHT-EMITTING DIODES (LED) (1)/FTERM
```

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E39          0   KT   Materials light-emitting diodes (LED)/FTERM
E40          0   KT   Means other than light-emitting diodes (LED)/FTERM
E41          0   KT   Members on which finished light-emitting diodes (LED)
                      are directly mounted/FTERM
E42          0   KT   Monolithic LED/FTERM
E43          0   KT   Monolithic light-emitting diode (LED) arrays/FTERM
E44          0   KT   Monolithic polychrome light-emitting diodes
                      (LED)/FTERM
E45          0   KT   Mounting multiple finished light-emitting diodes
                      (LED)/FTERM
E46          0   KT   Multiple light-emitting diodes (LED)/FTERM
E47          0   KT   Other members on which finished light-emitting diodes
                      (LED) are directly mounted/FTERM
E48          0   KT   Other structures attachment finished light-emitting
                      diodes (LED) auxiliaryfixtures/FTERM
E49          0   KT   Other structures attachment members on which finished
                      light-emitting diodes (LED) are directly mounted
                      members on which they are ultimately mounted/FTERM
E50          0   KT   Other structures mounting finished light-emitting
                      diodes(LED) members on which they are mounted/FTERM
```

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E67          0   KT   e.g. LED/FTERM
E68          0   KT   e.g., LED, EL/FTERM
E69          0   KT   e.g., photo-transistors, photo-diodes, LED/FTERM
E70          0   KT   i.e. LED/FTERM
E71          0   KT   i.e., LED/FTERM
E72          0   KT   light-emitting diode displays (LED)/FTERM
E73          0   KT   light-emitting diodes (LED)/FTERM
E74          0   KT   using LED EL/FTERM
********** END **********
```

The term 'LED' is very common in the thesaurus, further expanding would be very time-consuming.

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Utilizing the FTERM-Thesaurus in WPINDEX

- Broader concept or widely used terms can not be easily researched in the thesaurus using keywords.
- Solution: extract symbols from highly relevant documents or ANALYZE answer sets

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> s nichia/pa and led/ti
         2171 NICHIA/PA
        52684 LED/TI
L4        383 NICHIA/PA AND LED/TI

=> d ti fterm

L4  ANSWER 1 OF 383  WPINDEX COPYRIGHT 2009 THOMSON REUTERS on STN
TI   Light-emitting element e.g. LED used in light emitting device
     for various application, has reflection layer with refractive
     index lower than refractive index of semiconductor structure

FTRM 5F041; 5F041/AA03; 5F041/AA34; 5F041/CA05; 5F041/CA13;
     5F041/CA34; 5F041/CA40; 5F041/CA49; 5F041/CA57; 5F041/CA65;
     5F041/CA88; 5F041/CA92; 5F041/CA94; 5F041/CB15; 5F041/DA04;
     5F041/DA12; 5F041/DA17; 5F041/DA19;
     5F041/DA57; 5F041/DB03; 5F041/DB09
```

Easily create a relevant answer set using the value-add titles in DWPI.

Ideally, use an
=> ANA L4 FTERM LEN 5
to find all relevant themes.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
=> e 5F041+all/fterm
E1      31628   -->  5F041/FTERM
                     Light-emitting diodes
                RFI  H01L33/00-33/00@Z
E2          3   NT1  5F041/AA00/FTERM
                     purpose
E3         17   NT2  5F041/AA01/FTERM
                     Optical purposes
E4        651   NT3  5F041/AA02/FTERM
                     Improved high-speed operation, transient
                     response, or the like
E5       6129   NT3  5F041/AA03/FTERM
                     Improved light-emission efficiency
E6       3401   NT3  5F041/AA04/FTERM
                     Increased optical output
E7       1638   NT3  5F041/AA05/FTERM
                     Uniform distribution of the intensity of
                     light emissions
E8       2166   NT3  5F041/AA06/FTERM
                     Prevention of light diffusion, improvement
```

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E39         9   NT1  5F041/BB00/FTERM
                     DRIVE CIRCUITS FOR LIGHT-EMITTING DIODES (LED)
E40        12   NT2  5F041/BB01/FTERM
                     Types of circuits
E41       374   NT3  5F041/BB02/FTERM
                     Amplification circuits
E42      1139   NT3  5F041/BB03/FTERM
                     Switching circuits
E43       335   NT3  5F041/BB04/FTERM
                     Circuits that limit currents
E44       222   NT4  5F041/BB05/FTERM
                     Currents that use single elements
E45       700   NT4  5F041/BB06/FTERM
                     Currents that use multiple elements (i.e.,
                     including constant-current circuits
E46       155   NT3  5F041/BB07/FTERM
                     Circuits for dividing of currents
E47       116   NT3  5F041/BB08/FTERM
                     Differential and integrating circuits (i.e.,
                     including smoothing circuits)
```

Aspect BB doesn't cover LEDs per se, but LED drivers.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E64          0   NT1  5F041/CA00/FTERM
                      FORMS OF LIGHT-EMITTING DIODES (LED) (1)
E65         13   NT2  5F041/CA01/FTERM
                      Junction structures
E66       1835   NT3  5F041/CA02/FTERM
                      Homojunctions
E67       1141   NT3  5F041/CA03/FTERM
                      Heterojunctions
E68       5671   NT4  5F041/CA04/FTERM
                      Double heterojunctions
E69       4081   NT3  5F041/CA05/FTERM
                      Superlattices (i.e., including quantum wells)
E70        434   NT3  5F041/CA06/FTERM
                      Metal-insulator-semiconductor (MIS) or
                      metal-semiconductor (MES) structures
E71        246   NT3  5F041/CA07/FTERM
                      Pnpn structures (e.g., thyristor structures)
E72        591   NT3  5F041/CA08/FTERM
                      Other junction structures
E73        455   NT2  5F041/CA10/FTERM
```

The (1) appended to the definition indicates that the aspect CA is not sufficient to cover all form terms.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E140         0   NT1  5F041/CB00/FTERM
                      FORMS OF LIGHT-EMITTING DIODES (LED) (2)
E141        85   NT2  5F041/CB01/FTERM
                      ELEMENT STRUCTURE
E142       286   NT3  5F041/CB02/FTERM
                      Current-constricting structures
E143      1070   NT4  5F041/CB03/FTERM
                      Potential barriers (e.g., p-n junctions)
E144      1078   NT4  5F041/CB04/FTERM
                      insulators
E145       718   NT4  5F041/CB05/FTERM
                      Mesa forms
E146       253   NT4  5F041/CB06/FTERM
                      Concentration of impurities
E147      1052   NT3  5F041/CB11/FTERM
                      Mesa structures
E148       104   NT3  5F041/CB12/FTERM
                      Ballast-type structures
E149       463   NT3  5F041/CB13/FTERM
                      Thin-film structures
```

Additional terms can be found under the aspect CB.

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Utilizing the FTERM-Thesaurus in WPINDEX

```
E316      335   NT3  5F041/FF04/FTERM
                     Indication by characters or symbols
E317      135   NT4  5F041/FF05/FTERM
                     Seven-segment elements
E318     1061   NT4  5F041/FF06/FTERM
                     Matrix elements
E319     5404   NT2  5F041/FF11/FTERM
                     illumination
E320      219   NT2  5F041/FF12/FTERM
                     ornament
E321     2226   NT2  5F041/FF13/FTERM
                     Printers or copiers
E322     3218   NT2  5F041/FF14/FTERM
                     Optical communications
E323       43   NT2  5F041/FF15/FTERM
                     Photoexcitation (e.g., lasers)
E324     2360   NT2  5F041/FF16/FTERM
                     OTHER APPLICATIONS
********** END **********
```

FTerms are highly detailed. With 323 subdivisions, 5F041 is not overly large.

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Utilizing the FTERM-Thesaurus in WPINDEX

=> s e39+nt
L5 4007 5F041/BB00+NT/FTERM (25 TERMS)

E39 were LED driver circuits.

=> d ti hit
L5 ANSWER 2 OF 1186 WPINDEX COPYRIGHT 2009 THOMSON REUTERS on STN
TI LED driver for electronic devices e.g. LCD display device, has phase difference generation circuit that introduces phase difference one by one in pulse width modulation (PWM) signal input to each constant current output circuit
FTRM 3K073; 5F041; 3K073/AA62; 3K073/AB01; 3K073/AB02; 3K073/BA09; 3K073/BA28; 5F041/BB12; 5F041/BB22; 5F041/BB24; 5F041/BB33; 3K073/CG01; 3K073/CG09; 3K073/CG13; 3K073/CG28; 3K073/CG47; 3K073/CJ17; 5F041/FF11

Described is a digital circuit (BB12) built from resistors (BB22) and capacitors (BB24) operating with intermittent pulses (BB33).

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Agenda

- Overview of patent classification systems
- International Patent Classification (IPC)
- National/Regional Classification Systems
  - European Classification (ECLA)
  - US National Classification (NCL)
  - Japanese File Index (FI)
  - Japanese File Forming Terms (F-Terms)
- Derwent Classsification
- Chemical Abstracts Classification

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STN

Thomson Reuters (Scientific) Indexing

- Proprietary indexing scheme
- Assigned by Thomson Reuters
- Three levels of detail
  - File Segment
  - Derwent Classification
  - Manual Codes
- Subject matter is split in 21 DWPI Classification Sections (A-X) and 3 broad File Segments

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Thomson Reuters (Scientific) Indexing File Segment

- Basic attribution
  - simple
- Three segments
  - Chemical Patents Index (CPI, Sections A-M)
  - General Mechanical Patents Index (GMPI, Sections P, Q)
  - Electrical Patents Index (EPI, Sections S-X)
- Easy to remember, no research necessary

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Thomson Reuters (Scientific) Indexing File Segment

```
=> s (((antilock or anti(w)lock)
      (2a)brak?(2a)system#) or abs)/ti,ab
L3        18877 (((ANTILOCK OR ANTI(W)LOCK)(2A)BRAK?(2A)SYSTEM#...

=> e a/fs
**** START OF FIELD ****
E3            0 --> A/FS
E4      6669765     CPI/FS
E5      8742713     EPI/FS
E6      8681585     GMPI/FS
**** END OF FIELD ****

=> s l4 not cpi/fs
L4        5163 L3 NOT CPI/FS
```

Restricting the search to a File Segment significantly reduces the number of hits in a matter of seconds.

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STN

Thomson Reuters (Scientific) Indexing Derwent Classification

- More Detail
  - all 21 sections
  - two-digit sub-section number for additional detail
- Manual Code - Thesaurus can be used

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STN

Thomson Reuters (Scientific) Indexing Derwent Classification

```
=> s (((antilock or anti(w)lock)
      (2a)brak?(2a)system#) or abs)/ti,ab
L3        18877 (((ANTILOCK OR ANTI(W)LOCK)(2A)BRAK?(2A)SYSTEM#...

=> s l3 and X22/dc
L4         3507 L3 AND X22/DC
```

Derwent Classes offer quick categorization of the search matter, much like IPC-Subclasses.

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Thomson Reuters (Scientific) Indexing Manual Codes

- Maximum Detail
- Thesaurus available
- Format

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Thomson Reuters (Scientific) Indexing Manual Codes

- Maximum Detail
- Thesaurus available
- Format
  - alphanumerical code*

A	NN	–	A	NN	A	N	(A)
Section	Subsection		Group	Subgroup	Division	Subdivision	

Manual Code

* **Note:** In the Electrical Patents Index Sections (S-X) the first three letters of the Manual Code (MC) are the same as the DWPI Classification (DC).

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Thomson Reuters (Scientific) Indexing Manual Codes

```
=> s (((antilock or anti(w)lock)
      (2a)brak?(2a)system#) or abs)/ti,ab
L3        18877 (((ANTILOCK OR ANTI(W)LOCK)(2A)BRAK?(2A)SYSTEM#...

=> e x22+nt1/mc
E1     479880   -->  X22/MC
E2        352  **NT1  X22-A/MC
                 DEF  FOR INTERNAL COMBUSTION ENGINES
E3       2832  **NT1  X22-B/MC
                 DEF  LIGHTING OR SIGNALLING
E4       2768  **NT1  X22-C/MC
                 DEF  BRAKING, STEERING*
                 HNTE (1980-1996)
E5       2225  **NT1  X22-D/MC
                 DEF  LOCKABLE SWITCHES; LOCKS; THEFT ALARMS
E6      13347  **NT1  X22-E/MC
                 DEF  INSTRUMENTATION FOR DASHBOARD
E7       3296  **NT1  X22-F/MC
                 DEF  POWER SUPPLIES; BATTERIES; ALTERNATORS; CHARGING
```

Expanding from the Derwent Class...

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Thomson Reuters (Scientific) Indexing Manual Codes

```
=> e x22-c+nt1/mc
E1         2768   -->  X22-C/MC
E2         2065  **NT1  X22-C01/MC
                   DEF  ANTI-SKID
                        ARRANGEME
                   HNTE (1983-1996)
E3         4822  **NT1  X22-C02/MC
                   DEF  BRAKING
                   HNTE (1997-    )
E4         4960  **NT1  X22-C05/MC
                   DEF  STEERING
                   HNTE (1983-    )
********** END **********
```

… allows you to explore the MC-hierarchy…

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Thomson Reuters (Scientific) Indexing Manual Codes

```
=> e e3+nt1
E1         4822    -->  X22-C02/MC
E2          949     NT1  X22-C02A/MC
                    DEF  PARKING B
                    HNTE (1997-
E3         5415   **NT1  X22-C02C/MC
                    DEF  BRAKING FORCE CONTROLLER
                    HNTE (1997-    )
E4         1186   **NT1  X22-C02D/MC
                    DEF  AUTOMATIC BRAKE INITIATION
                    HNTE (1997-    )
********** END **********
```

…through relationship codes.

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Thomson Reuters (Scientific) Indexing Manual Codes

```
=>  e e3+nt1
E1         5415    -->  X22-C02C/MC
E2         1090     NT1  X22-C02C1/MC
                    DEF  ANTI-SLIP BRAKE REGULATION
                    HNTE (1997-    )
E3         3442     NT1  X22-C02C3/MC
                    DEF  ANTI-LOCK BRAKE SYSTEM
                    HNTE (1997-    )
E4          570     NT1  X22-C02C5/MC
                    DEF  ELECTRONIC STABILITY CONTROL
                    HNTE (2005-    )
E5          350     NT1  X22-C02C7/MC
                    DEF  BRAKE-BY-WIRE
```

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Thomson Reuters (Scientific) Indexing Manual Codes

```
=> s (((antilock or anti(w)lock)
      (2a)brak?(2a)system#) or
L3         18877 (((ANTILOCK OR ANTI(W ...

=> s l3 and X22-C02C3/MC
X22-C02C3 ANTI-LOCK BRAKE SYSTEM
          3442 X22-C02C3/MC
L4        1454 L3 AND X22-C02C3/MC
```

Manual Codes are a powerful and convenient search tool.

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STN

Agenda

- Overview of patent classification systems
- International Patent Classification (IPC)
- National/Regional Classification Systems
  - European Classification (ECLA)
  - US National Classification (NCL)
  - Japanese File Index (FI)
  - Japanese File Forming Terms (F-Terms)
- Derwent Classsification
- Chemical Abstracts Classification

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Chemical Abstracts Sections

- Assigned by CAS to all documents in CA
  - Proprietary indexing scheme
  - Not restricted to patents
  - represents physical sections of the (former) printed product
- Two levels of detail
  - File Segment
  - Section Codes
- Subject matter is split in 80 sections and 5 broad File Segments

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STN

Chemical Abstracts Sections File Segment

- Basic attribution
  - simple
- Five segments
  - Biochemistry (BIO)
  - Organic Chemistry (ORG)
  - Macromolecular Chemistry (MAC)
  - Applied Chemistry and Chemical Engineering (APP)
  - Physical, Inorganic, and Analytical Chemistry (PIA)
- Easy to remember, no research necessary

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STN

Chemical Abstracts Sections File Segment

```
=> s l1 and BIO/FS
9791617 BIO/FS
L2       199 L1 AND BIO/FS
```

File Segments are an easy way to restrict your search to a general area.

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STN

Chemical Abstracts Sections Section Codes

- File Segments subdivided in 80 section codes
  - further subdivisions available
- Thesaurus available
  - historical changes need to be addressed (+HIS)
- Five segments
  - Easy to remember, no research necessary

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Chemical Abstracts Sections File Segment

```
=>? section
...
Biochemistry (BIO/FS)

 1. Pharmacology
 2. Mammalian Hormones
 3. Biochemical Genetics
 4. Toxicology
 5. Agrochemical Bioregulators
 6. General Biochemistry
 7. Enzymes
 8. Radiation Biochemistry
 9. Biochemical Methods
10. Microbial, Algal, and Fungal Biochemistry
11. Plant Biochemistry
12. Nonmammalian Biochemistry
13. Mammalian Biochemistry
14. Mammalian Pathological  Biochemistry
15. Immunochemistry
```

HELP SECTION opens a list of the **Section Codes** available.

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STN

Chemical Abstracts Sections File Segment

```
16. Fermentation and Bioindustrial Chemistry
17. Food and Feed Chemistry
18. Animal Nutrition
19. Fertilizers, Soils, and Plant Nutrition
20. History, Education, and Documentation

Organic Chemistry (ORG/FS)

21. General Organic Chemistry
22. Physical Organic Chemistry
23. Aliphatic Compounds
24. Alicyclic Compounds
25. Benzene, Its Derivatives, and Condensed Benzenoid Compounds
26. Biomolecules and Their Synthetic Analogs
27. Heterocyclic Compounds (One Hetero Atom)
28. Heterocyclic Compounds (More Than One Hetero Atom)
29. Organometallic and Organometalloidal Compounds
30. Terpenes and Terpenoids
31. Alkaloids
```

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Chemical Abstracts Sections File Segment

```
 34. Amino Acids, Peptides, and Proteins

 Macromolecular Chemistry (MAC/FS)

 35. Chemistry of Synthetic High Polymers
 36. Physical Properties of Synthetic High Polymers
 37. Plastics Manufacture and Processing
 38. Plastics Fabrication and Uses
 39. Synthetic Elastomers and Natural Rubber
 ...

=> e 35+use/cc
E1      346125   -->  35/CC
E2         416     USE  35 ALKALOIDS, 1962 ONLY/CC
E3      228495     USE  35 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                        PRESENT/CC
E4       14808     USE  35 NONCONDENSED AROMATIC COMPOUNDS, 1963-1966/CC
E5      102406     USE  35 SYNTHETIC HIGH POLYMERS, 1967-1981/CC
********** END **********
```

Section Number 35 had different titles over time.

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STN

Chemical Abstracts Sections File Segment

```
=> e e3+all
E1     2750111   BT1  MACROMOLECULAR/CC
E2      228495     -->  35 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                        PRESENT/CC
                     NOTE THIS SECTION INCLUDES THE CHEMICAL TRANSFORMATIONS
                          OF SYNTHETIC HIGH POLYMERS: SYNTHESIS AND REACTIONS
                          OF POLYMERS, RELATED MONOMERS, AND POLYMER MODELS;
                          …
                     HNTE SUBJECT WAS COVERED IN SOMEWHAT BROADER SECTIONS
                          PRIOR TO 1982.  THESE OLD BROADER SECTIONS CAN BE
                          DISPLAYED USING THE +OLD RELATIONSHIP CODE.
E3       12584       OLD  26 PAINTS, VARNISHES, AND R
E4        7643       OLD  26 PIGMENTS, RESINS, VARNIS
                          1906-1909/CC
E5        2999       OLD  26 PIGMENTS, RESINS, VARNIS
                          1911-1914/CC
E6         386       OLD  27 PIGMENTS, RESINS, VARNISHES, AND INDIA RUBBER,
                          1910 ONLY/CC
E7       35045       OLD  31 SYNTHETIC RESINS AND PLASTICS, 1945-1961/CC
E8      102406       OLD  35 SYNTHETIC HIGH POLYMERS, 1967-1981/CC
E9       16132       OLD  45 SYNTHETIC HIGH POLYMERS, 1963-1966/CC
E10       6367       OLD  47 PLASTICS, 1962 ONLY/CC
```

The subject was previously covered in different sections.

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Chemical Abstracts Sections File Segment

```
E11          0       NT1  35-0 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                          PRESENT, REVIEWS/CC
E12          0       NT1  35-1 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                          PRESENT, GENERAL/CC
E13          0       NT1  35-10 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                          PRESENT, OTHER/CC
E14          0       NT1  35-2 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                          PRESENT, MONOMERS AND REAGENTS USED IN
                          POLYMERIZATION/CC
E15          0       NT1  35-3 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
                          PRESENT, POLYMERIZATION KINETICS, MECHANISMS,
                          THERMODYNAMICS, CATALYSIS, CATALYSTS/CC

=> s l4 and (e2+old or 35/sx)
        412057 "35 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
               PRESENT"+OLD/CC  (9 TERMS)
         91535 35/SX
L5        2902 L4 AND ("35 CHEMISTRY OF SYNTHETIC HIGH POLYMERS, 1982 TO
               PRESENT"+OLD/CC OR 35/SX)
```

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Patent Classification on

Jeremias Gromotka

CAS is a division of the American Chemical Society

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