



# What Patent Searchers Need to Know from Patent Attorneys

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## STN, CAS, and Science IP – how they all fit together

- **STN<sup>®</sup>** - Online database service that provides global access to published scientific research, journal literature, patents, structures, sequences, properties, and other data (>170 databases)
- **CAS** (Chemical Abstracts Service)
  - Co-host of STN with FIZ Karlsruhe (Europe)
  - Division of the American Chemical Society (ACS)
  - Database producer
    - CAlus<sup>SM</sup>, CAS REGISTRY<sup>SM</sup>, CASREACT<sup>®</sup>, CHEMCATS<sup>®</sup>, CHEMLIST<sup>®</sup>, CIN<sup>®</sup>, MARPAT<sup>®</sup>
  - Developer of industry-leading search and analysis tools, e.g.,
    - STN<sup>®</sup> Express<sup>TM</sup>, SciFinder<sup>®</sup>, STN<sup>®</sup> AnaVist<sup>TM</sup>
- **Science IP<sup>®</sup>** - CAS Search Service

The logo for STN, consisting of the letters 'STN' in a bold, blue, sans-serif font with a registered trademark symbol (®) to the upper right.The logo for CAS, consisting of the letters 'CAS' in a blue, stylized, rounded font with a registered trademark symbol (®) to the upper right.

*A division of the American Chemical Society*

The logo for Science IP, featuring a stylized sunburst graphic above the text 'SCIENCE IP' in blue and gold, with 'The CAS Search Service' in blue below it.

## Agenda

### What patent searchers need to know from patent attorneys

- Legal reason for search
- Background information
- Report format



Confirm how this translates into search strategy

### What patent attorneys should know about search tools and tactics

- Methods for defining concepts
- Tactics for text searching
  - Proximity Operators
  - Limit to specific fields



Increase comprehensiveness of search

Increase precision of search

## Patent attorneys and searchers have similar workflows

### Patent attorney

- Receive request from client
- Pre-Interview preparation
- Interview inventor/client
- Prepare search instructions
- Information analysis – relevance
- Prepare opinion/draft application

### Patent searcher

- Receive request from attorney
- Pre-Interview preparation
- Interview patent attorney
- Develop search strategy
- Execute search
- Prepare search report
  - may include culling or “bucketing” of results

## Typically, the searcher receives a quick search request from the attorney

**Sent:** Friday, February 04, 2011  
**To:** Mullican, Michael  
**Subject:** Search Request

**Mike:**  
**Search patents for gel formulations of aspirin.**  
**-A**

**SCIENCE IP**  
The CAS Search Service

Phone messages for Mike

*Prior Art*

*US 6 287 731*

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> State-of-the Art | <input type="checkbox"/> Prior Art/Literature Search | <input checked="" type="checkbox"/> Patentability |
| <input type="checkbox"/> Infringement     | <input type="checkbox"/> Freedom-to-Practice/Operate | <input type="checkbox"/> General Research         |
| <input type="checkbox"/> Other _____      |  |   |

# Search request example: Freedom-to-Operate search for gel formulations of aspirin

Search Request 3/31/2011 - 14:00:00

Reason For Search: **Freedom-to-Operate**

Search Topic: **Gel formulations of Aspirin**

Keywords and Concepts:


Compound Names/Tradenames: **aspirin, acetylsalicylic acid**

Key Authors or References:

Range of Years:

Additional Information:

# Searcher interviews attorney to confirm legal reason for search

 US006248731B1	
(12) <b>United States Patent</b> <b>Blahut</b>	(10) Patent No.: <b>US 6,177,418</b> (45) Date of Patent: <b>Dec. 19, 2000</b>
(54) <b>STABILIZED ASPIRIN COMPOSITIONS AND METHOD OF PREPARATION FOR ORAL &amp; TOPICAL USE</b>	(56) <b>References Cited</b> U.S. PATENT DOCUMENTS
(76) Inventor: <b>Natalie Blahut</b> , 9302 Miccosukee, Tallahassee, FL 32310	1,217,862 2/1917 Gerngross et al.
(*) Notice: Subject to any patent is extended under U.S.C. 154(b)	<b>Controlled delivery of aspirin: Effect of aspirin degradation and <i>in vitro</i> release from PLGA systems</b>
(21) Appl. No.: <b>09/739,018</b>	Yu Tang <sup>1</sup> and Jagdish Singh <sup>1</sup>
(22) Filed: <b>Dec. 19, 2000</b>	<sup>1</sup> Department of Pharmaceutical Sciences, College of Pharmacy, Nursing, and Health Sciences, North Dakota State University, Fargo, ND 58105, USA
<b>Related U.S. Applications</b>	Received 1 August 2007; revised 22 January 2008; accepted 24 January 2008; published online 6 February 2008.
(62) Division of application No. 2000, now Pat. No. 6,177,418	<b>Abstract</b>
(51) Int. Cl. <sup>7</sup> .....	The objective of this study was to develop poly (D,L-lactide-co-glycolide) (PLGA) based <i>in vitro</i> gel forming formulations controlled delivery system for controlled delivery of aspirin, and to characterize the <i>in vitro</i> release of aspirin and polymer degradation. Aspirin was dissolved into PLGA and poly (D,L-lactide-co-glycolide) (PLGA) was used as plasticizer to reduce initial burst release. The solvent was removed to form a gel depot. Released samples were withdrawn periodically and analyzed by high performance liquid chromatography. The effect of aspirin on the degradation of PLGA was studied by Nuclear Magnetic Resonance and Gel Permeation Chromatography. PLGA based <i>in vitro</i> gel forming formulations controlled delivery system showed that the <i>in vitro</i> release of aspirin for 7 days only. Analysis of PLGA matrix residuals revealed that PLGA in aspirin loaded formulations exhibited a significantly ( $p < 0.05$ ) faster degradation compared to blank formulations. These findings suggest that aspirin causes an unusually faster degradation of PLGA. Such faster degradation of PLGA has not been noticed for any other drugs reported in the literature.
(52) U.S. Cl. ....	
(58) Field of Search .....	

- Non-Patent Publications ✓
- Patent Publications
  - US
    - Granted ✓
    - PGpubs ✓
  - PCTs
    - All ✓
    - Designated for US
    - Not yet entered the national phase
  - Foreign ✓

## Searcher interviews attorney to confirm legal reason for search (cont.)

- **Freedom-to-Operate**
  - Last 20-25 years?
- **Validity/Invalidity cut-off date: April, 20, 1998**
  - US patent publications: **filing** dates prior to April 20, 1998
  - PCTs designated for the US with **filing** dates prior to April 20, 1998
  - Foreign publications and other PCTs: **Publication** dates prior to April 20, 1998
  - Non-patent: **Publication years** prior to 1999

## During interview, search and attorney come to an understanding of the number of answers and cost

- **How many is too many answers?**
  - Limit to granted US patents
  - Limit text search to title, abstract, or claims
- **Budget**

## During interview, searcher and attorney settle on desired report format

L2 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2006:677774 HCAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 145:110486  
 TITLE: Stabilizing salicylate compositions and method of preparation for oral and topical use  
 INVENTOR(S): Blahut, Natalie  
 PATENT ASSIGNEE(S): USA  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
<a href="#">US 20060153935</a>	A1	20060713	US 2006-327380	20060109
PRIORITY APPLN. INFO.:			US 2005-641748P	P 20050107
			US 2005-696520P	P 20050706

AB Salicylic acid or [acetylsalicylic](#) acid are combined with citric acid and then mixed with a concd. potassium hydroxide soln. to form a stable compd. of either potassium salicylic acid or potassium [acetylsalicylic](#) acid that can be used to make lotions, creams, [gels](#) or ointments for topical [formulations](#) or mixed to form a sports, health or therapeutic drinks.

## During interview, searcher and attorney settle on desired report format (cont.)

Title	Inventor	Patent Number	Abstract
Stabilizing salicylate compositions and method of preparation for oral and topical use	Blahut, Natalie	<a href="#">US 20060153935</a>	Salicylic acid or acetylsalicylic acid are combined with citric acid and then mixed with a concentrated potassium hydroxide solution to form a stable compound of either potassium salicylic acid or potassium <b>acetylsalicylic</b> acid that can be used to make lotions, creams, <b>gels</b> , or ointments for <b>topical formulations</b> or mixed to form sports, health, or therapeutic drinks.
<b>Topical analgesic formulation</b> containing fruits, oils and <b>aspirin</b>	DeGrate, Frenchell	<a href="#">US 5932230</a>	An analgesic cosmetic formulation in the form of an ointment, salve, or cream which is applied to the skin, including the hands and feet for the treatment of such conditions as redness, swelling, itching, and soreness of the skin. The cosmetic formulation contains ingredients including oranges, avocado, watermelon, banana, lemon, palm oil, coconut oil, petroleum jelly, beeswax, aloe vera, vitamin E, aspirin, ammonium sulfate, sodium bisulfate, and quine sulfate.

## Post-interview, the search is better defined

Search Request 3/31/2011 - 14:00:00

Reason For Search: **Freedom-to-Operate**

Search Topic: **Topical formulations of Aspirin, preferably gel**

Keywords and Concepts: **topical, gel, ointment**

Compound Names/Tradenames: **aspirin, acetylsalicylic acid, CAS  
Registry number 50-78-2 and sodium and potassium salts**

Key Authors or References: **Aware of US 6,287,731**

Additional Information:

- **World-wide patents and non-patent publications**
- **Patents citing US 6,287,731**
- **limit text search to claims if >500 documents found**
- **display bibliographic data only; a table**


## Defining concepts: why and how

- **Why use more than one method?**
  - Enhance comprehensiveness
- **How?**
  - Text terms
  - Patent classification codes – IPC (International), ECLA (European), US or Japanese (F-terms)
  - Database thesauri of controlled vocabulary or terms – CAS controlled terms, MeSH terms, roles, manual codes, Uniterms
  - Chemical structures – Chemical names, trade/generic names, lab codes; chemical identifiers, e.g., CAS Registry Numbers; Markush structures

Controlled vocabulary is an established list of standardized terminology for use in indexing and retrieval of information

*OECD Glossary of Statistical Terms* <http://stats.oecd.org/glossary/about.asp>

# Patent classification codes are important for defining concepts

 US006248731B1	
(12) <b>United States Patent</b> <b>Blahut</b>	(10) <b>Patent No.:</b> <b>US 6,248,731 B1</b> (45) <b>Date of Patent:</b> <b>Jun. 19, 2001</b>
<hr/>	
(54) <b>STABILIZED ASPIRIN COMPOSITIONS AND METHOD OF PREPARATION FOR ORAL &amp; TOPICAL USE</b>	(56) <b>References Cited</b>
(76) Inventor: <b>Natalie Blahut</b> , 9302 Miccosukee, Tallahassee, FL (US) 32308	U.S. PATENT DOCUMENTS 1,217,862     2/1917   Gerngross et al. .... 514/159 3,279,990    10/1966   Rose et al. .... 514/159 4,228,162    10/1980   Luzzi et al. .... 424/232 4,885,287    12/1989   Hussain et al. .... 514/159 5,723,453    3/1998   Phykitt ..... <b>514/165</b>
( * ) Notice:   Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	FOREIGN PATENT DOCUMENTS 1489672     10/1977   (GB) .
(21) Appl. No.: <b>09/739,018</b>	<i>Primary Examiner</i> —Raymond Henley, III (74) <i>Attorney, Agent, or Firm</i> —Dowell & Dowell
(22) Filed: <b>Dec. 19, 2000</b>	
<b>Related U.S. Application Data</b>	
(62) Division of application No. 2000, now Pat. No. 6,177,411	<b>ABSTRACT</b> sitions for oral and topical use are stabilized with potassium hydroxide.
(51) <b>Int. Cl.</b> <sup>7</sup> .....	<b>9 Claims, No Drawings</b>
(52) <b>U.S. Cl.</b> .....	
(58) <b>Field of Search</b> .....	

## International patent classification codes and their definitions can be found on STN

BT1 A61K0031-00/IPC - Medicinal preparations containing organic active ingredients

--> A61K0031-60/IPC

. Salicylic acid; Derivatives thereof

NT1 A61K0031-612/IPC

. . having the hydroxy group in position 2 esterified

NT2 A61K0031-616/IPC

. . . by carboxylic acids, e.g. acetylsalicylic acid

## US patent classification codes and their definitions can be found on STN

BT1 514001000/NCL

DESIGNATED ORGANIC ACTIVE INGREDIENT CONTAINING

--> 514159000/NCL

.Ortho-hydroxybenzoic acid (i.e., salicylic acid)

NT1 514163000/NCL

..With carboxylic acid, ester or metal salt thereof

NT1 514165000/NCL

..Aspirin per se (i.e., 2-(acetyloxy)benzoic acid)

## Structure databases like CAS REGISTRY are important for defining substances

L2 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2011 ACS on STN

RN 50-78-2 REGISTRY

CN Benzoic acid, 2-(acetyloxy)- (CA INDEX NAME)

OTHER NAMES:

CN 2-(Acetyloxy)benzoic acid

CN 2-Acetoxybenzoic acid

CN 2-Carboxyphenyl acetate

. . .

CN Acetosalic acid

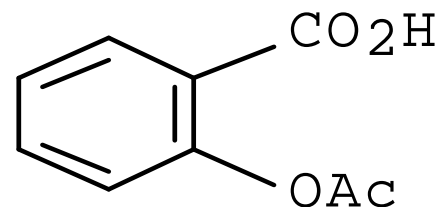
CN Acetosalin

. . .

CN Acetylsalicylic acid

. . .

CN Aspirin



Note: Ac =  $-\text{C}(\text{O})\text{CH}_3$

## Following concept definition, a more complete set of terms and definitions is available for aspirin

- **Text terms**

- Aspirin, acetylsalicyl?, acetyloxybenzoic, acetyloxybenzoate, carboxyphenyl acetate, acetosalic, acetosalin...

- **Patent classification codes**

- International: A61K 31/616
- US: 514/165

- **Structure terms – CAS Registry Numbers**

- parent compound: 50-78-2
- potassium salt (1:1): 3839-54-1
- potassium salt (2:1): 25817-25-8
- sodium salt: 493-53-8
- sodium salt hydrate(1:1:2): 112317-24-5

## Key documents can help find text terms for topical or gel

### US 6,248,731 B1

What is claimed is:

• • •

8. The medicinal drug of claim 6 mixed with a water based carrier including a **dermtologically acceptable lotion, cream, gel or ointment** with a resulting pH which is compatible to mammalian **skin**.

## Reference books can also be used to find text terms

*Physical Chemistry.* a **semirigid colloidal** dispersion of a solid with a liquid or gas, as jelly, glue, etc.

*Biochemistry.* a **semirigid polymer**, as agarose, starch, cellulose acetate, or polyacrylamide, cast into slabs or cylinders for the electrophoretic separation of proteins and nucleic acids.

*Dictionary.com Unabridged, based on Random House Dictionary*

A **semirigid** jelly-like **colloid** in which a liquid is dispersed in a solid:  
*nondrip paint is a gel*

*Collins English Dictionary*

A **colloid** in which the disperse phase combines with the dispersion medium to produce a **semisolid material**. v. gelled, gel-ling, gels

*American Heritage © Stedman's Medical Dictionary Dictionary.com*

<http://dictionary.reference.com/browse/gel>

## Patent classification codes help define the gel concept

- **US Patent Classification Codes**

514	Drug, bio-affecting and body treating compositions
514/944	Gel
514/969	Ointment or Salve base
514/947	Penetrant or absorbent (enhances penetration into subject treated); Topical Application
514/887	Inflammation, skin; Topical Treatment

## Define gel concepts with CAS thesauri

```
BT2 Disperse systems/CT
  BT1 Colloids/CT
    --> Gels/CT
      UF Colloidal gels/CT
      UF Gel/CT
      NT1 Cosmetic gels/CT
      NT1 Hydrogels/CT
      NT1 Microgels/CT
      NT1 Pharmaceutical gels/CT
        NT2 Pharmaceutical hydrogels/CT
      . . .
      RT Gelation/CT
```

# Define gel concepts with MEDLINE thesauri and MeSH terms

```
E42      BT1      Administration, Topical/CT
E43              --> Administration, Cutaneous/CT
E44              MN      E2.319.267.120.60./CT
E47              UF      Administration, Dermal/CT
E49              UF      Administration, Percutaneous/CT
E50              UF      Administration, Transcutaneous/CT
E51              UF      Administration, Transdermal/CT
E76              UF      Skin Administration, Drug/CT
E84              NT1     Transdermal Patch/CT
```

## Following concept definition, a more complete set of terms and definitions is available for topical and gel

- **Text terms**

- topical?, skin, dermis, dermaceutical?, dermatol?, dermal?, dermatitis?, transderm?, diaderm?, cutaneous?, percutan?, transcutan?, epiderm?,
- gel, gelling, gelled, jell, jelled, jelling, gelate#, gelation, gelatinous, gelatination, hydrogel?, salve, ointment, cream, lotion, unguent, unguentum, pomade, paste, toothpaste, colloidal suspension, gelatin(notW)capsule, (semirigid or semisolid)(1A)colloid? . . .

- **Patent classification codes**

- US: 514/944, 514/969, 514/947, 514/887
- International: A61K 09/06

- **Controlled terms**

- MeSH Terms: E2.319.267.120.60./CT
- CAS: Pharmaceutical gels/CT, Drug delivery systems (L) ointments, gels/CT, Pharmaceutical jelly/CT, Pharmaceutical hydrogels/CT, Pharmaceutical hydrogels/CT

## Tools and tactics help refine the text search

Boolean operators	Fields in patent record
<ul style="list-style-type: none"><li>• AND</li><li>• OR</li><li>• NOT (AND NOT)</li></ul>	<ul style="list-style-type: none"><li>• Title</li><li>• Abstract</li><li>• Claims</li><li>• Controlled Terms</li></ul>

## Use proximity operators to refine search

Operator	Definition	Search	Sample Result
(10W)*	within 10 words in the order shown	semirigid (10W) colloid	semirigid...colloid
(10A)*	within 10 words in either direction	semirigid (10A) colloid	semirigid...colloid colloid...semirigid
(S)**	Same sentence	semirigid (S) colloid	semirigid...colloid colloid...semirigid
(P)**	Same paragraph	semirigid (P) colloid	
(L)**	Same search field	semirigid (L) colloid	
(T)	terms occurring in within a single word in either direction	?trans? (T) ?derm?	transdermal, transepidermal, transperidermal, dermatrans

\*Limited to the same sentence

\*\*Definition varies by STN database

## Use proximity operators to refine search (cont'd)

Operator	Example - Definition	Sample Result
(notW)	gelatin? (notW) capsul?  Documents in which the term gelatin? is NOT immediately followed by capsul?	<ul style="list-style-type: none"><li>• Will find documents containing the terms:<ul style="list-style-type: none"><li>– gelatin</li><li>– gelatin AND gelatin capsule</li></ul></li><li>• Will <u>NOT</u> find documents which only contain the term:<ul style="list-style-type: none"><li>– gelatin capsule</li></ul></li></ul>

## Use wildcards to simplify text search strategy

Symbol	Definition	Search	Example results
?	0 to any number of characters	topical? ?topical ?topical?	topical, topicaly topical, atopical topical, topicaly, atopical, atopically
#	0 to 1 characters (at end of word)	gel#	gel, gels, gell
!	1 character (internal)	gel!tinous	geletinous, gelitinous (misspelling of gelatinous)

**Note:** Left truncation not available in all STN databases

## Summary

- **Confirm legal reason for search**
- **Confirm how legal reason translates to the search strategy**
- **Use key documents to aid in defining concepts**
- **Be aware of multiple methods of defining concepts**
  - Text, patent classification codes, controlled terms (database thesauri), structure search
- **Be aware of search tools and tactics**
  - limit by fields, proximity operators, wildcards, left and right truncation





# Thank you!

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