



Understanding and using the IPC

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Nathalie Montillot

Program Officer, Technology and Innovation Support Division

Scenario



- You go to a library to do research on architecture in ancient China.
- How would you find books on this topic?

Photo source: Ragesoss (Wikimedia)

Library search

ancient

China

architecture



Photo source: GPA666 (Wikimedia)

Library search

ancient ✓

China ✓

architecture ✓



Photo source: British Library

Library search

ancient ✘

China ✔

architecture ✘



→ Common synonyms and related terms

Library search

ancient ✘

China ✘

architecture ✘

→ Other languages



Question

■ How could you solve these problems?

→ Library classification systems (e.g. Dewey Decimal System)

Classification

Dewey Decimal System

- 722 → Architecture to ca. 300
- 931 → History of ancient world China

Scenario



- You are searching a patent collection for documents on Portland cement.
- How would you find relevant documents?

Photo source: U.S. National Archives and Records Administration

Patent classification



International Patent Classification

■ C04B 7/02 → Portland cement

Photo source: Unknown

Patent classification vs. Keywords

- Terminology and jargon independent
- Language independent

→ A more complete and precise search

Advantages of patent classification

- Applied in a standardized manner to patent documents
- Available for patent documents published (nearly) anywhere in the world
- Available for (old) patent documents for which little or no searchable text is available
- Specially adapted for patent documentation

Advantages of the IPC

- IPC is the unifying system of patent classification worldwide, classifying patent documents in more than 100 countries
- Other patent classifications such as the Cooperative Patent Classification (CPC) managed by the EPO and USPTO build upon the IPC to provide more granular and advanced classification

IPC Structure

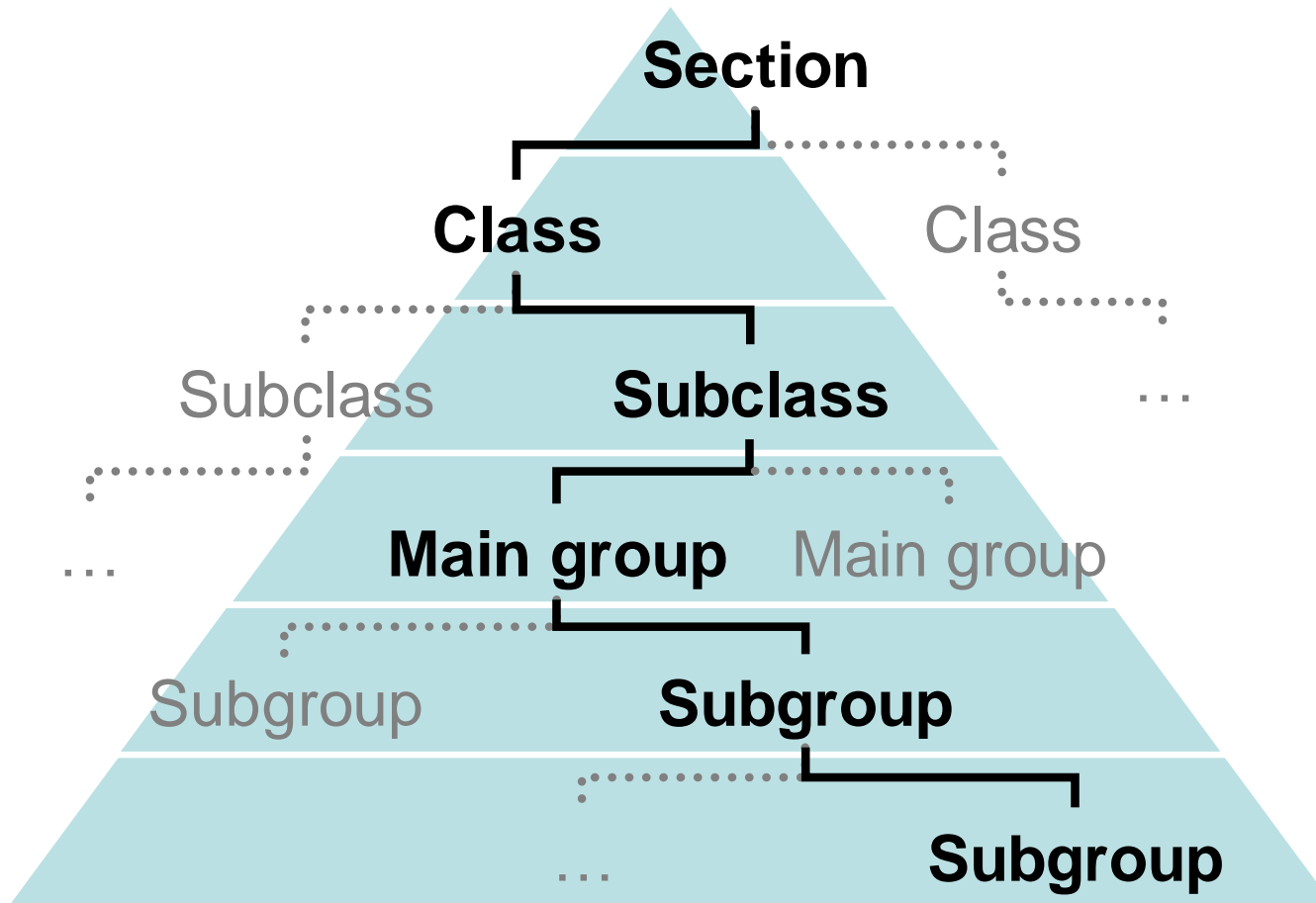
- Technologies are divided into eight sections (A-H) with approximately 75,000 subdivisions, each represented by a language independent symbol

+	A	HUMAN NECESSITIES
+	B	PERFORMING OPERATIONS; TRANSPORTING
+	C	CHEMISTRY; METALLURGY
+	D	TEXTILES; PAPER
+	E	FIXED CONSTRUCTIONS
+	F	MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
+	G	PHYSICS
+	H	ELECTRICITY

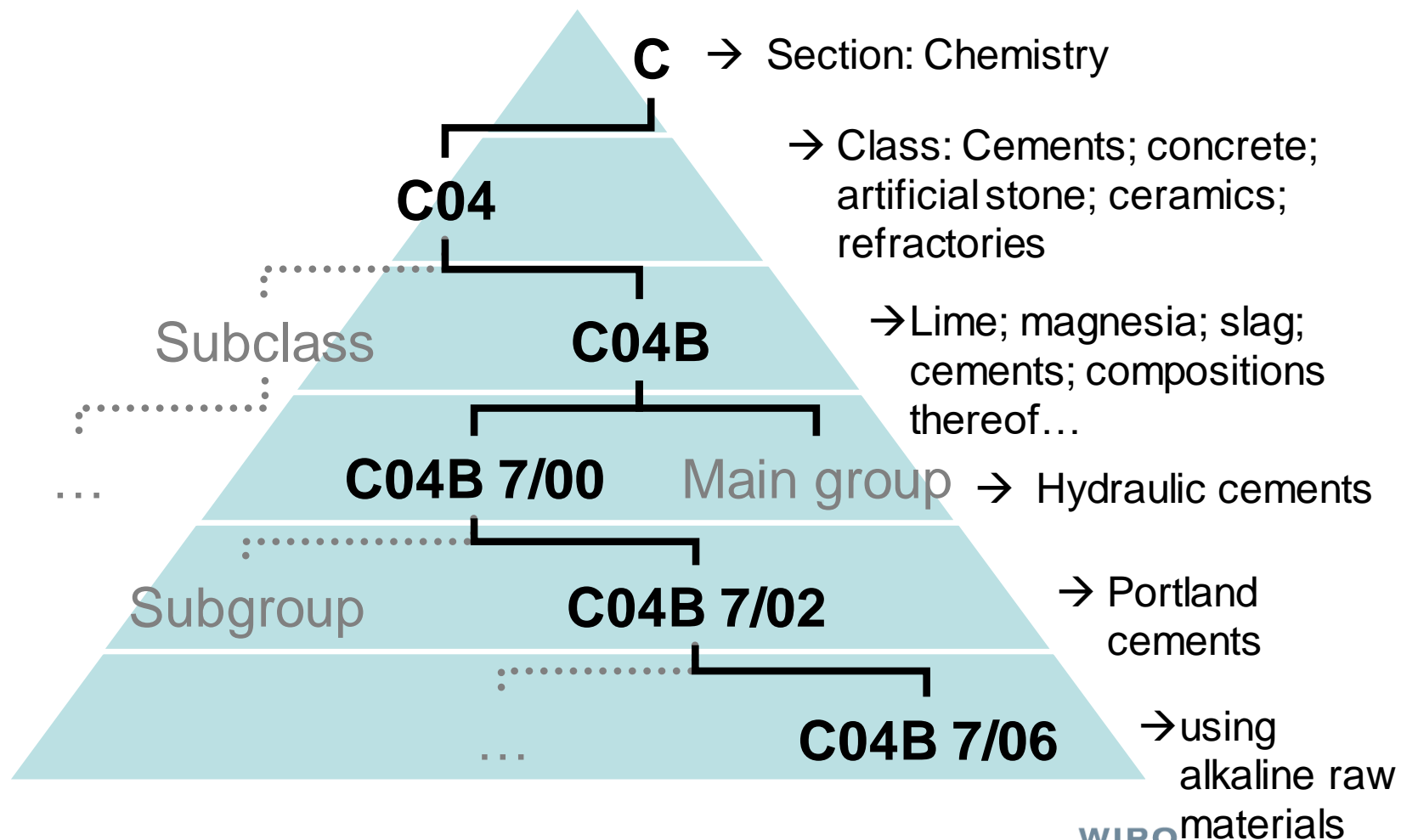
IPC: Structure

- Hierarchical
 - Section
 - Class
 - Subclass
 - Main group
 - Subgroup

IPC: Structure



IPC: Structure



IPC: Structure (subgroups)

C04B 7/00

Hydraulic cements [2006.01]

C04B 7/02

• Portland cement [2006.01]

C04B 7/04

• • using raw materials containing gypsum [2006.01]

C04B 7/06

• • using alkaline raw materials [2006.01]

C04B 7/12

• Natural pozzuolanas; Natural pozzuolana cements [2006.01]

C04B 7/13

• • Mixtures thereof with inorganic cementitious materials, e.g. Portland cements [2006.01]

C04B 7/14

• Cements containing slag [2006.01]

C04B 7/147

• • Metallurgical slag [2006.01]

C04B 7/153

• • • Mixtures thereof with other inorganic cementitious materials or other activators [2006.01]

C04B 7/17

• • • • with calcium oxide containing activators [2006.01]

C04B 7/19

• • • • • Portland cements [2006.01]

C04B 7/21

• • • • • with calcium sulfate containing activators [2006.01]

C04B 7/22

• Iron ore cements [2006.01]

C04B 7/24

• Cements from oil shales, residues or waste other than slag [2006.01]

C04B 7/26

• • from raw materials containing flue dust [2006.01]

C04B 7/28

• • from combustion residues (C04B 7/26 takes precedence) [2006.01]

→ More dots = lower hierarchical level

Example

- Use IPC classification to retrieve patent documents related to solar cells

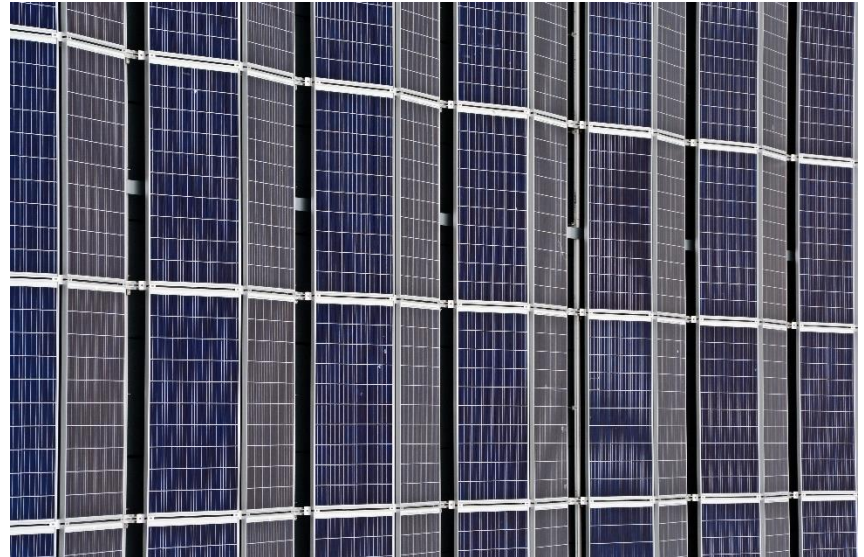


Photo source: Pixabay



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International Patent Classification (IPC)

The International Patent Classification (IPC), established by the [Strasbourg Agreement 1971](#), provides for a hierarchical system of language independent symbols for the classification of [patents](#) and utility models according to the different areas of technology to which they pertain. A new version of the IPC enters into force each year on January 1.

[Access the International Patent Classification](#)

Find out more

- [Preface](#)
- [Guide to the IPC](#)
- [Statistics](#)
- [Frequently asked questions](#)

FEATURED



International Patent Classification (IPC) Brochure

An effective and easy-to-use system to classify and search patent documents

[Download](#)

www.wipo.int/classifications/ipc/en/

IPC Official Publication

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

IPC HOME | DOWNLOAD

2021.01 Version

type an IPC Symbol

None

PDF

English version
 French version
 English/French

Path view
 Full view
 Hierarchic view
 Maingroup view

Tree view
 CPC FI

Deleted entries
 Subclass indexes
 Guidance Headings
 Notes

<input type="checkbox"/>	A	HUMAN NECESSITIES
<input type="checkbox"/>	B	PERFORMING OPERATIONS; TRANSPORTING
<input type="checkbox"/>	C	CHEMISTRY; METALLURGY
<input type="checkbox"/>	D	TEXTILES; PAPER
<input type="checkbox"/>	E	FIXED CONSTRUCTIONS
<input type="checkbox"/>	F	MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
<input type="checkbox"/>	G	PHYSICS
<input type="checkbox"/>	H	ELECTRICITY

Browse using the IPC scheme

The screenshot displays the WIPO IP Portal interface for IPC Publication. The top navigation bar includes 'WIPO IP PORTAL', 'MENU', 'IPC Publication', 'HELP', 'ENGLISH', and the WIPO logo. Below the navigation bar, a secondary menu contains 'Scheme', 'RCL', 'Compilation', 'Catchwords', and 'Search'. The 'Scheme' option is highlighted with a red box. The main content area lists IPC classes A through G, with 'H ELECTRICITY' highlighted by a red box. The left sidebar contains various filters and options, including 'IPC HOME | DOWNLOAD', a version dropdown set to '2021.01', a search input field, and several radio button options for language and view types. At the bottom of the sidebar, checkboxes for 'CPC', 'FI', 'Deleted entries', 'Guidance Headings', and 'Notes' are visible.

Class	Description
A	HUMAN NECESSITIES
B	PERFORMING OPERATIONS; TRANSPORTING
C	CHEMISTRY; METALLURGY
D	TEXTILES; PAPER
E	FIXED CONSTRUCTIONS
F	MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
G	PHYSICS
H	ELECTRICITY

Browse using the IPC scheme

H **ELECTRICITY**

Note(s)
These Notes cover the basic principles and general instructions for use of section H.

I. Section H covers:

- a. basic electric elements, which cover all electric units and the general mechanical structure of apparatus and circuits, including the assembly of various basic elements into what are called printed circuits and also cover to a certain extent the manufacture of these elements (when not covered elsewhere);
- b. generation of electricity, which covers the generation, conversion and distribution of electricity together with the controlling of the corresponding gear;
- c. applied electricity, which covers:
 - i. general utilisation techniques, viz. those of electric heating and electric lighting circuits;
 - ii. some special utilisation techniques, either electric or electronic in the strict sense, which are not covered by other sections of the Classification, including:
 - 1. electric light sources, including lasers;
 - 2. electric X-ray technique;
 - 3. electric plasma technique and the generation and acceleration of electrically charged particles or neutrons;
- d. basic electronic circuits and their control;
- e. radio or electric communication techniques;

+	H01	BASIC ELECTRIC ELEMENTS
+	H02	GENERATION, CONVERSION, OR DISTRIBUTION OF ELECTRIC POWER
+	H03	BASIC ELECTRONIC CIRCUITRY
+	H04	ELECTRIC COMMUNICATION TECHNIQUE
+	H05	ELECTRIC TECHNIQUES NOT OTHERWISE PROVIDED FOR
+	H99	SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [2006.01]

IPC search options and features

- Smart/advanced search
- Catchwords
- Definitions
- STATS

IPC Search

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords **Search**

IPC HOME | DOWNLOAD

2021.01 Version

type an IPC Symbol

None

PDF

English version
 French version
 English/French

Path view
 Full view
 Hierarchic view
 Maingroup view

Tree view
 CPC FI

Deleted entries
 Subclass indexes
 Guidance Headings
 Notes

<input type="checkbox"/>	A	HUMAN NECESSITIES
<input type="checkbox"/>	B	PERFORMING OPERATIONS; TRANSPORTING
<input type="checkbox"/>	C	CHEMISTRY; METALLURGY
<input type="checkbox"/>	D	TEXTILES; PAPER
<input type="checkbox"/>	E	FIXED CONSTRUCTIONS
<input type="checkbox"/>	F	MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
<input type="checkbox"/>	G	PHYSICS
<input type="checkbox"/>	H	ELECTRICITY

IPC Search

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

IPC HOME | DOWNLOAD

2021.01 Version

English version
 French version

Advanced Search

Terms

Cross-references

STATS


IPCCAT

Terms search:

Stemming

A01N,A01I Limit to

A01N,A01I Exclude

Path 

Scheme titles

Scheme references

Catchwords


Definitions

solar cells

Search Reset

Ordered by relevance:

- H01L 31/0687
- H01L 31/076
- H01L 31/0445
- H01L 31/046
- H01L 31/0693
- H01L 31/0747
- F24S 23/00
- F24S 20/30
- H01M 14/00
- F24S 50/80

 1/30

Prepare copy

IPC Advanced Search

The screenshot displays the WIPO IP Portal interface for IPC Advanced Search. The top navigation bar includes the WIPO logo, 'MENU', 'IPC Publication', 'HELP', 'ENGLISH', and another WIPO logo. Below this, a secondary navigation bar contains 'Scheme', 'RCL', 'Compilation', 'Catchwords', and 'Search'. The main content area features a large search input field, a 'Search' button, and a 'Reset' button. Below the search area are three boxes labeled 'Scheme terms', 'Catchword terms', and 'Definition terms'. On the left side, there is a sidebar with various options: 'IPC HOME | DOWNLOAD', a version selector (2021.01), language options (English and French), and a red-bordered box around the 'Advanced Search' checkbox. Below these are sections for 'Terms', 'Cross-references', 'STATS', and 'IPCCAT'. The 'Terms search:' section includes checkboxes for 'Stemming', 'Path', 'Scheme titles', 'Scheme references', 'Catchwords', and 'Definitions', along with 'Limit to' and 'Exclude' input fields.

WIPO IP PORTAL MENU

IPC Publication

HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

IPC HOME | DOWNLOAD

2021.01 Version

English version

French version

Advanced Search

Terms

Cross-references

STATS

IPCCAT

Terms search:

Stemming

A01N,A01I Limit to

A01N,A01I Exclude

Path

Scheme titles

Scheme references

Catchwords

Definitions

Search Reset

Scheme terms

Catchword terms

Definition terms

IPC Advanced Search

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

PC HOME | DOWNLOAD

2021.01 Version

English version
 French version

Advanced Search

Terms

Cross-references

STATS

IPCCAT

Terms search:

Stemming

A01N,A01I Limit to

A01N,A01I Exclude

Path

Scheme titles

Scheme references

Catchwords

Definitions

solar cells

Search Reset

Scheme terms

H01L 31/0687
H01L 31/076
H01L 31/0445
H01L 31/046
H01L 31/0693
H01L 31/0747
F24S 23/00
F24S 20/30
H01M 14/00
F24S 50/80

1/30

Prepare copy

Catchword terms

SOLAR

Definition terms

B62M 6/85
H01L 31/0687
H01L 31/078
H01L 31/0725
H01L 31/0443
H01L 31/0445
H01L 31/047
H01L 31/076
H01L 31/042
H01L 31/0525

1/4

Prepare copy

IPC Search Results (Catchwords)

The screenshot displays the WIPO IP Portal interface for an IPC search. The search term 'solar cells' is entered in the search box. The results are organized into three columns: Scheme terms, Catchword terms, and Definition terms. The 'Catchword terms' column is highlighted with a red box and shows the word 'SOLAR'. The 'Scheme terms' column lists various IPC codes such as H01L 31/0687, H01L 31/076, H01L 31/0445, H01L 31/046, H01L 31/0693, H01L 31/0747, F24S 23/00, F24S 20/30, H01M 14/00, and F24S 50/80. The 'Definition terms' column lists codes such as B62M 6/85, H01L 31/0687, H01L 31/078, H01L 31/0725, H01L 31/0443, H01L 31/0445, H01L 31/047, H01L 31/076, H01L 31/042, and H01L 31/0525. The interface includes a left sidebar with navigation options like 'PC HOME | DOWNLOAD', 'Version', 'English version', 'French version', 'Advanced Search', 'Terms', 'Cross-references', 'STATS', and 'IPCCAT'. The top navigation bar includes 'WIPO IP PORTAL', 'MENU', 'IPC Publication', 'HELP', 'ENGLISH', and 'WIPO'. The bottom right corner features the WIPO logo and the text 'WORLD INTELLECTUAL PROPERTY ORGANIZATION'.

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

solar cells

Search Reset

Scheme terms

H01L 31/0687
H01L 31/076
H01L 31/0445
H01L 31/046
H01L 31/0693
H01L 31/0747
F24S 23/00
F24S 20/30
H01M 14/00
F24S 50/80

1/30

Prepare copy

Catchword terms

SOLAR

Definition terms

B62M 6/85
H01L 31/0687
H01L 31/078
H01L 31/0725
H01L 31/0443
H01L 31/0445
H01L 31/047
H01L 31/076
H01L 31/042
H01L 31/0525

1/4

Prepare copy

WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

IPC Catchword Index

WIPO IP PORTAL MENU

IPC Publication

Scheme RCL Compilation Catchwords Search

SOIL fertilisation C05
SOIL pans [= waste pans] A47K 11/00
SOIL sterilisation A01G 11/00, A01N 25/00-A01N 65/00, C05, C09K 17/00
stabilising SOIL for foundations E02D 3/00
stabilising SOIL for roads E01C 3/04, E01C 7/36, E01C 21/00

SOLAR
drying solid material by SOLAR radiation F26B 3/28
SOLAR heat collectors F24S
SOLAR panel of photoelectric cells H01L 31/042
using SOLAR energy F03G 6/00
using SOLAR heat F24S

SOLDERING
making tubes with soldered seams B21C 37/08
manufacture of SOLDERING -wire or SOLDERING -rods B23K 35/40
soldered electric connections H01R 1/02

IPC Scheme

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

PC HOME | DOWNLOAD

2021.01 Version

type an IPC Symbol

H01L 31/042

English version

French version

English/French

Path view

Full view

Hierarchical view

Maingroup view

Tree view

CPC FI

Scheme	RCL	Compilation	Catchwords	Search
		H01L 31/0352	•• characterised by their shape or by the shapes, relative sizes or disposition of the semiconductor regions [2006.01]	
	-	H01L 31/036	•• characterised by their crystalline structure or particular orientation of the crystalline planes [2006.01]	
		H01L 31/0368	••• including polycrystalline semiconductors (H01L 31/0392 takes precedence) [2006.01]	
		H01L 31/0376	••• including amorphous semiconductors (H01L 31/0392 takes precedence) [2006.01]	
		H01L 31/0384	••• including other non-monocrystalline materials, e.g. semiconductor particles embedded in an insulating material (H01L 31/0392 takes precedence) [2006.01]	
		H01L 31/0392	••• including thin films deposited on metallic or insulating substrates [2006.01]	
D	A -	H01L 31/04	• adapted as photovoltaic [PV] conversion devices (testing thereof during manufacture H01L 21/66; testing thereof after manufacture H02S 50/10) [2014.01]	
D		H01L 31/041	•• Provisions for preventing damage caused by corpuscular radiation, e.g. for space applications [2014.01]	
D	-	H01L 31/042	•• PV modules or arrays of single PV cells (supporting structures for PV modules H02S 20/00) [2014.01]	
		H01L 31/043	••• Mechanically stacked PV cells [2014.01]	
D	-	H01L 31/044	••• including bypass diodes (bypass diodes in the junction box H02S 40/34) [2014.01]	
D		H01L 31/0443	•••• comprising bypass diodes integrated or directly associated with the devices, e.g. bypass diodes integrated or formed in or on the same substrate as the photovoltaic cells [2014.01]	
D	-	H01L 31/0445	••• including thin film solar cells, e.g. single thin film a-Si, CIS or CdTe solar cells [2014.01]	
D	-	H01L 31/046	•••• PV modules composed of a plurality of thin film solar cells deposited on the same substrate [2014.01]	
D		H01L 31/0463	••••• characterised by special patterning methods to connect the PV cells in a module, e.g. laser cutting of the conductive or active layers [2014.01]	
D		H01L 31/0465	••••• comprising particular structures for the electrical interconnection of adjacent PV cells in the module (H01L 31/0463)	

Hierarchic view

WIPO IP PORTAL MENU *IPC Publication* HELP ENGLISH WIPO

Scheme RCL Compilation Catchwords Search

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type an IPC Symbol

H01L 31/042

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 Full view
 Hierarchic view
 Main group view
 Tree view
 CPC FI
 Deleted entries
 Subclass indexes
 Guidance Headings
 Notes

body of the device is placed, or which is formed around the body without forming an intimate layer thereon. An enclosure which consists of one or more layers formed on the body and in intimate contact therewith is referred to as an "encapsulation";

- "integrated circuit" is a device where all components, e.g. diodes, resistors, are built up on a common substrate and form the device including interconnections between the components;
- "assembly" of a device is the building up of the device from its component constructional units and includes the provision of fillings in containers.

3. In this subclass, both the process or apparatus for the manufacture or treatment of a device and the device itself are classified, whenever both of these are described sufficiently to be of interest.

4. Attention is drawn to Note (3) after the title of section C, which Note indicates to which version of the periodic table of chemical elements the IPC refers. In this subclass, the Periodic System used is the 8 group system indicated by Roman numerals in the Periodic Table thereunder.

D	-	H01L 31/00	Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength, or corpuscular radiation and specially adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof (H01L 51/42 takes precedence; devices consisting of a plurality of solid state components formed in, or on, a common substrate, other than combinations of radiation-sensitive components with one or more electric light sources, H01L 27/00) [2006.01]	
D	A	-	H01L 31/04	• adapted as photovoltaic [PV] conversion devices (testing thereof during manufacture H01L 21/66; testing thereof after manufacture H02S 50/10) [2014.01]
D		H01L 31/041	• Provisions for preventing damage caused by corpuscular radiation, e.g. for space applications [2014.01]	
D	+	H01L 31/042	• PV modules or arrays of single PV cells (supporting structures for PV modules H02S 20/00) [2014.01]	
L	+	H01L 31/052	• Cooling means directly associated or integrated with the PV cell, e.g. integrated Peltier elements for active cooling or heat sinks directly associated with the PV cells (cooling means in combination with the PV module H02S 40/42) [2014.01]	
D		H01L 31/053	• Energy storage means directly associated or integrated with the PV cell, e.g. a capacitor integrated with a PV cell (energy storage means associated with the PV module H02S 40/38) [2014.01]	

IPC: Structure (notes and references)

D	—	H01L 31/00	Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength, or corpuscular radiation and specially adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof ; Details thereof (H01L 51/42 takes precedence; devices consisting of a plurality of solid state components formed in, or on, a common substrate, other than combinations of radiation-sensitive components with one or more electric light sources, H01L 27/00) [2006.01]	
D	⚠	—	H01L 31/04	• adapted as photovoltaic [PV] conversion devices (testing thereof during manufacture H01L 21/66; testing thereof after manufacture H02S 50/10) [2014.01]
D	—	H01L 31/042	• • PV modules or arrays of single PV cells (supporting structures for PV module H02S 20/00) [2014.01]	

→ Relevant symbols

—	H02S 20/00	Supporting structures for PV modules [2014.01] Note(s) [2014.01] Supporting structures also intended for use with solar heat collectors should also be classified in groups F24S 25/00-F24S 30/00 or F24S 50/20.
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→ IPC versions

IPC: Structure (definitions)

D - H01L 31/00 Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelengths than corpuscular radiation and specially adapted either for the conversion

Glossary term ✕

devices:
The term "device" refers to an electric circuit element; where an electric circuit element is one of a plurality of elements formed in or on a common substrate it is referred to as a "component".

D - H01L 31/042 •• PV modules or arrays of single PV cells (supporting structures for PV modules H02S 20/00)

Glossary term ✕

conversion devices:
light sensitive devices specially adapted for conversion of light into electrical energy, not for the purpose of light detection

→ Relevant definitions

IPC Search Results (STATS)

The screenshot displays the WIPO IP Portal interface for the 'IPC Publication' section. The search term 'solar cells' is entered in the search box. The 'STATS' option is highlighted in the left sidebar. The search results are displayed in three columns: Scheme terms, Catchword terms, and Definition terms.

Scheme terms:

- H01L 31/0687
- H01L 31/076
- H01L 31/0445
- H01L 31/046
- H01L 31/0693
- H01L 31/0747
- F24S 23/00
- F24S 20/30
- H01M 14/00
- F24S 50/80

Catchword terms:

- SOLAR

Definition terms:

- B62M 6/85
- H01L 31/0687
- H01L 31/078
- H01L 31/0725
- H01L 31/0443
- H01L 31/0445
- H01L 31/047
- H01L 31/076
- H01L 31/042
- H01L 31/0525

→ see the frequency of IPC symbols in patent documents by using IPC statistics

IPC Search Results (STATS)

WIPO IP PORTAL MENU *IPC Publication*

Scheme RCL Compilation Catchwords Search

solar cells


2021.01 Version
 English version
 French version
 Advanced Search

Terms
Cross-references
STATS
IPCCAT

STATS
 Stemming
A01N,A01I Limit to
A01N,A01I Exclude

Search Reset

STATS

 **Results**

55	H01L	+
10	H02S	+
10	H02J	+
6	H01M	+
5	G06F	+
5	C23C	+
4	F21V	+
4	B32B	+
4	F21S	+
4	C09K	+

IPC Search Results (STATS)

The screenshot shows the WIPO IP Portal interface. The top navigation bar includes 'WIPO IP PORTAL', 'MENU', 'IPC Publication', 'HELP', 'ENGLISH', and 'WIPO'. Below the navigation bar, there are tabs for 'Scheme', 'RCL', 'Compilation', 'Catchwords', and 'Search'. The main content area displays search results for the IPC class H01L. The results are listed in a table-like format with columns for the class symbol and the class description. The result for H01L is highlighted with a red box.

IPC HOME | DOWNLOAD

2021.01 Version

type an IPC Symbol

H01L

English version

French version

English/French

Path view

Full view

Scheme RCL Compilation Catchwords Search

applied electricity, referred to in I(c), above, which appears in section H itself.

H01 BASIC ELECTRIC ELEMENTS

Note(s) [7]

1. Processes involving only a single technical art, e.g. drying, coating, for which provision exists elsewhere are classified in the relevant class for that art.
2. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "microstructural devices" and "microstructural systems".

D H01L SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR (use of semiconductor devices for measuring G01; resistors in general H01C; magnets, inductors, transformers H01F; capacitors in general H01G; electrolytic devices H01G 9/00; batteries, accumulators H01M; waveguides, resonators, or lines of the waveguide type H01P; line connectors, current collectors H01R; stimulated-emission devices H01S; electromechanical resonators H03H; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R; electric light sources in general H05B; printed circuits, hybrid circuits, casings or constructional details of electrical apparatus, manufacture of assemblages of electrical components H05K; use of semiconductor devices in circuits having a particular application, see the subclass for the application) [2]

Note(s) [2010.01]

1. This subclass covers:

IPC bridge to Patentscope

The screenshot shows the WIPO IP Portal interface for the IPC Bridge - H01L 31/042. The page is divided into several sections:

- IPC National translations:** A grid of flags and language names including Chinese, Japanese, Slovak, Czech, Polish, Spanish, Dutch, Portuguese, Russian, German, Serbian, and Ukrainian.
- Patent databases:** A section listing various national patent databases: Patentscope, J-PlatPat, Espacenet, FR Espacenet, DEPATIS, USPTO, SPD (SE), PATENDIAMET (EE), KIPRIS (KR), and WEBREG (SK).
- Other classifications:** A section listing USPC, CPC, and FI / F-term.

The left sidebar contains navigation and search options, including a search bar, a version dropdown (2021.01), and a list of view options (English version, French version, etc.). A red box highlights a share icon in the sidebar. Another red box highlights the 'Patent databases' section in the main content area.

IPC bridge to Patentscope

IC:"H01L 31/042"



65,057 results

Offices all

Languages en

Stemming false

Single Family Member true

Include NPL false



Sort: Pub Date Desc ▾ Per page: 10 ▾ View: All ▾

< 1 / 6,508 ▾ >

Machine translation ▾

1. [20210159845](#) CASCADED SOLAR CELL STRING

US - 27.05.2021

Int.Class [H02S 20/25](#) Appl.No 17184507 Applicant Tesla, Inc. Inventor Bhavananda R. NADIMPALLY

One embodiment can provide a photovoltaic roof tile. The photovoltaic roof tile can include a front cover, a back cover, and a plurality of photovoltaic structures positioned between the front and back covers. A respective photovoltaic structure can include a first edge busbar positioned near an edge of a first surface and a second edge busbar positioned near an opposite edge of a second surface. The plurality of photovoltaic structures can be arranged in such a way that the first edge busbar of a first photovoltaic structure overlaps the second edge busbar of an adjacent photovoltaic structure with a layer of adhesive conductive film sandwiched between the first and second edge busbars, thereby resulting in the plurality of photovoltaic structures forming a serially coupled string.

2. [WO/2021/098299](#) ADHESIVE FILM, ANTI-PID ENCAPSULATION ADHESIVE FILM, COMPOSITION FORMING ADHESIVE FILM, AND PHOTOVOLTAIC MODULE AND LAMINATED GLASS

WO - 27.05.2021

Int.Class [C09J 4/08](#) Appl.No PCT/CN2020/109835 Applicant HANGZHOU FIRST APPLIED MATERIAL CO., LTD. Inventor WEI, Mengjuan

Disclosed are an adhesive film, an anti-PID encapsulation adhesive film, a composition forming the adhesive film, and a photovoltaic module and laminated glass. The composition comprises: an ethylene copolymer matrix resin, an amide organic matter, a metal oxide and/or a metal hydroxide, wherein the metal oxide is selected from one or more of the components aluminum oxide, calcium oxide, zinc oxide, barium oxide, magnesium oxide, zirconium oxide, titanium oxide, tin oxide, vanadium oxide, antimony oxide, tantalum oxide, niobium oxide, a laminar transition metal oxide, or ZnO-doped Al₂O₃, CaO/SiO₂-doped Al₂O₃, MgO-doped Al₂O₃, SiO₂-doped ZrO₂, and TiO₂-doped ZrO₂ which have undergone a doping treatment, and the metal hydroxide is selected from one or more of the components calcium hydroxide, magnesium hydroxide, zinc hydroxide, aluminum hydroxide, iron hydroxide and barium hydroxide. Alternatively, the composition comprises: a matrix resin, a metal ion trapping agent and an organic co-crosslinker. The adhesive film has a good anti-PID effect, photoelectric conversion efficiency and encapsulation performance.

3. [WO/2021/098916](#) SOLAR MODULE

WO - 27.05.2021

Int.Class [H01L 31/042](#) Appl.No PCT/DE2020/100977 Applicant HANWHA Q CELLS GMBH Inventor GERBIG, Christian

The invention relates to a solar module having at least two substring groups [A, B, C], each comprising an upper substring [A1, B1, C1] having a number of solar cells [11] connected in series, wherein the solar cells [11] of the upper substrings [A1, B1, C1] are arranged in a matrix form composed of at least two adjacent columns and a plurality of rows, a lower substring [A2, B2, C2] having a number of solar cells [21] connected in series, wherein the solar cells [21] are arranged in a matrix form composed of at least two adjacent columns and a plurality of rows, and wherein the lower substring [A2, B2, C2] and the upper substring [A1, B1, C1] comprise the same number of solar cells [11, 21] and a cross-connector [3], which interconnects the lower substring [A2, B2, C2] and the upper substring [A1, B1, C1] electrically in parallel to form the substring group [A, B, C], and a bypass diode [4] arranged electrically in the cross-connector [3], wherein the cross-connectors [3] of each substring group [A, B, C] are contacted with one another such that they are interconnected electrically in series with one another, wherein two columns of the lower substring [A2, B2, C2] comprise a different number of solar cells [21] and two columns of the associated upper substring [A1, B1, C1] in the substring group [A, B, C] comprise a different number of solar cells [11], such that the number of solar cells [11] of the upper substring [A1, B1, C1] and of the lower substring [A2, B2, C2] is odd.

IPC Green Inventory

- Special inventory for environmentally sound technologies as per the UN Framework Convention on Climate Change

TOPIC	IPC	PATENTSCOPE
▶ ALTERNATIVE ENERGY PRODUCTION		
▶ TRANSPORTATION		
▶ ENERGY CONSERVATION		
▶ WASTE MANAGEMENT		
▶ AGRICULTURE / FORESTRY		
▶ ADMINISTRATIVE, REGULATORY OR DESIGN ASPECTS		
▶ NUCLEAR POWER GENERATION		

<https://www.wipo.int/classifications/ipc/green-inventory/home>

IPC Green Inventory

■ Example: Alternative energy production: Biofuels

TOPIC	IPC	PATENTSCOPE
▼ ALTERNATIVE ENERGY PRODUCTION		
▼ BIO-FUELS		
▶ SOLID FUELS	C10L 5/00 , 5/40-5/48	C10L 5/00 , 5/40-5/48
▶ LIQUID FUELS	C10L 1/00 , 1/02 , 1/14	C10L 1/00 , 1/02 , 1/14
BIOGAS	C02F 3/28 , 11/04 C10L 3/00 C12M 1/107 C12P 5/02	C02F 3/28 , 11/04 C10L 3/00 C12M 1/107 C12P 5/02
FROM GENETICALLY ENGINEERED ORGANISMS	C12N 1/13 , 1/15 , 1/21 , 5/10 , 15/00 A01H	C12N 1/13 , 1/15 , 1/21 , 5/10 , 15/00 A01H
INTEGRATED GASIFICATION COMBINED CYCLE (IGCC)	C10L 3/00 F02C 3/28	C10L 3/00 F02C 3/28

IPC Green Inventory: bridge to IPC



C12M 1/00

Apparatus for enzymology or microbiology [2006.01]

Note(s) [3]

This group covers:

- apparatus where microorganisms or enzymes are produced or isolated;
- apparatus where the characteristics of microorganisms or enzymes are investigated, e.g. which growth factors are necessary;
- apparatus specially adapted to employ microorganisms or enzymes as "reactants" or biocatalysts;
- apparatus of both the laboratory and industrial scale.

C12M 1/02

• with agitation means; with heat exchange means [2006.01]



C12M 1/04

• with gas introduction means [2006.01]

C12M 1/06

• • with agitator, e.g. impeller [2006.01]

C12M 1/08

• • with draft tube [2006.01]

C12M 1/09

• • Flotation apparatus [2006.01]

C12M 1/10

• rotatably mounted [2006.01]



C12M 1/107

• with means for collecting fermentation gases, e.g. methane (producing methane by anaerobic treatment of sludge C02F 11/04) [2006.01]

IPC Green Inventory: bridge to Patentscope

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IC:"C12M 1/107" 13,900 results

Offices all Languages en Stemming false Single Family Member false Include NPL false

Sort: Relevance ▾ Per page: 10 ▾ View: All ▾ 1 / 1,390 ▾ Machine translation ▾

- 20040203139** WAY OF USING MICROORGANISMS FOR GETTING ENERGY /BIOREACTOR/ US - 14.10.2004
Int.Class [C12M 1/107](#) ? Appl.No 10647891 Applicant SHTOK DAVID Inventor Shtok David
This invention falls into the category of micro biotechnology. The claim is creation of the bioreactor populated with community of microorganisms, which participate in the process of oxygenation of carbohydrates of the natural origin and, as a final result, production of methane gas-CH₄. The new bioreactor makes possible the use of methane in automobile and energy production. At the same time it does not create harmful discharge into the atmosphere and keeps the environment 100% free of contamination. This invention applies a unique makeup of microorganisms: producers of methane. Produced methane is pumped through a system of pressure regulators into internal combustion engines, which are used in the energy production and other areas of industry. The bioreactor doesn't have any analogies in the world practice. Its application allows to discontinue the use of oil as the basis for production of gasoline and to replace other energy producing media.
- 34134** HỆ THỐNG KHÍ SINH HỌC VN - 25.08.2013
Int.Class [C12M 1/107](#) ? Appl.No 1201300287 Applicant SIMGAS IP B.V. Inventor CASTRO, Samuel
Sáng chế đề cập đến hệ thống khí sinh học gồm một bể kéo dài tạo thành một khoang phân hủy bên trong kéo dài, trong đó theo h/w; ống kéo dài của nó bể gồm một ngăn cuối ở tr/w; ống, nhiều ngăn giữa và một ngăn phía sau xếp thành dãy bao xung quanh khoang phân hủy, trong đó ngăn cuối ở tr/w; ống, các ngăn giữa và ngăn phía sau có các mép ngoài đ/w; ống ghép tỉ vào nhau.

IPC Help Page

The screenshot displays the WIPO IP Portal interface for the IPC Publication page. The top navigation bar includes the WIPO logo, a MENU button, and the page title "IPC Publication". Below the navigation bar, there are tabs for Scheme, RCL, Compilation, Catchwords, and Search. The main content area shows a list of IPC classes (A-H) with expandable icons (+) and their corresponding titles. On the right side, a help menu is visible, which is highlighted with a red circle. This menu contains the following items: CONTACT US, IPCPUB Support, Guide to the IPC, Download and IT support, TERMS OF USE, and PRIVACY POLICY. The left sidebar contains various utility buttons and options, including a search bar, a version selector (2021.01), and language selection options (English, French, English/French).

Guide to the IPC:

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