

H01G

CAPACITORS; CAPACITORS, RECTIFIERS, DETECTORS, SWITCHING DEVICES OR LIGHT-SENSITIVE DEVICES, OF THE ELECTROLYTIC TYPE (selection of specified materials as dielectric [H01B 3/00](#); {ceramics [C04B](#)})

Definition statement

This place covers:

Passive two-terminal electrical components used to store energy in an electrical field, typically two electrical conductors, i.e. electrodes, separated by a dielectric or dielectric medium.

Non-electrolytic, fixed capacitors, per se, e.g. thin and thick film capacitors, details thereof, e.g. electrodes, dielectrics, housings and encapsulations, and structural combinations thereof with each other, e.g. stacked, multilayer, feed-through or anti-noise capacitors, or with electrolytic devices covered by this subclass, or with other electric elements not covered by this subclass where the structure consists mainly of a capacitor. Processes of manufacture thereof. [H01G 4/00](#).

Non-electrolytic, variable capacitors per se, in which the capacitance is varied by mechanical means, e.g. using variation of effective area of electrode, using variation of distance between electrodes, e.g. capacitors making use of microelectromechanical systems (MEMS), or using multiple capacitors. Details thereof, and structural combinations thereof with each other, with electrolytic devices covered by this subclass, or with other electric elements not covered by this subclass where the structure consists mainly of a capacitor. Processes of manufacture thereof. [H01G 5/00](#).

Non-electrolytic, variable capacitors per se, in which the capacitance is varied by non-mechanical means, e.g. electrets, ferroelectric capacitors. Details thereof, and structural combinations thereof with each other, with electrolytic devices covered by this subclass, or with other electric elements not covered by this subclass where the structure consists mainly of a capacitor. Processes of manufacture thereof. [H01G 7/00](#).

Electrolytic capacitors per se, e.g. liquid, solid, electric double layer, hybrid or redox capacitors, details thereof, e.g. terminals, electrolytes, electrodes, housings, and processes of manufacture thereof. Electrolytic rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices per se, and details thereof. Structural combinations thereof with each other, with non-electrolytic capacitors or with other electric components not covered by this subclass. Processes of manufacture thereof. [H01G 9/00](#).

Apparatus specially adapted for manufacturing capacitors; Processes specially adapted for manufacturing capacitors not provided for in other main groups of this subclass. [H01G 13/00](#).

Structural combinations of capacitors or other devices covered by at least two different main groups of this subclass with each other. [H01G 15/00](#).

Structural combinations of capacitors or other devices covered by at least two different main groups of this subclass with other electric elements, not covered by this subclass, e.g. RC combinations. [H01G 17/00](#). Details common to two or more main types of devices covered by this subclass, e.g. special adaptation for mounting; cooling, heating and ventilating arrangements; housings, encapsulations and protection or prevention arrangements. [H01G 2/00](#).

References

Limiting references

This place does not cover:

Selection of specified materials as dielectric	H01B 3/00
Capacitors with potential-jump or surface barrier	H01L 29/92 , H01L 51/05 .

Impedance networks utilizing capacitors, e.g. filters and circuitry thereof	H03H
Electret transducers	H04R 19/00

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Capacitive deionisation for electrochemical separation	C02F 1/4691
Indicating or measuring liquid level, or level of fluent solid material by measuring variations of capacity of capacitors	G01F 23/26
Measuring temperature using capacitive elements	G01K 7/34
Thin- or thick-film integrated circuits; Capacitors as components of an integrated circuit, e.g. stacked capacitors in DRAMs	H01L 27/00
Thin-film capacitors for integrated circuits; corresponding multi-step manufacturing processes	H01L 28/40
Thin- or thick-film solid state devices	H01L 49/02
Printed circuits incorporating printed capacitors	H05K 1/16

Informative references

Attention is drawn to the following places, which may be of interest for search:

Powder metallurgy	B22F
Layered products	B32B
Micromechanical devices, comprising flexible or deformable elements	B81B 3/00
Active carbon	C01B 32/30
Compositions of ceramic materials	C04B 35/00
Polymeric films or sheets	C08J 5/18
Electrolytic coating by surface reaction, i.e. forming conversion layers	C25D 11/00- C25D 11/38
Measuring force or stress by measuring variations in capacitance	G01L 1/14
Measuring steady or quasi-steady pressure of a fluid or a fluent solid material by making use of variations in capacitance	G01L 9/12
Investigating or analyzing material by investigating capacitance	G01N 27/22
Measuring capacitance; Measuring dielectric constants	G01R 27/26
Variable capacitance devices operated as switches	H01H 1/00
Batteries and fuel cells	H01M
Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries	H02J 7/00
Casings for electrical apparatus in general	H05K 5/00

Special rules of classification

Processes of manufacture specially adapted for manufacturing capacitors, e.g. parts thereof. e.g. dielectrics, electrodes, etc are covered by the corresponding product subgroups.

The following exceptions apply:

- Solid inorganic dielectrics vapour deposited are covered by [H01G 4/08](#).
- Formation of the dielectric layer is covered by [H01G 9/0032](#).
- Formation of a solid electrolyte layer is covered by [H01G 9/0036](#).

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Collector	a conductive component in intimate contact with an electrode material in an electrolytic or electric double layer capacitor
Electrolyte	an ionic conducting liquid or solid either comprised in one of the electrodes, typically the cathode, of an electrolytic capacitor or ensuring electric conduction between electrode active parts or electric double layers therein in Electric Double Layer Capacitors

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

MLCC	Multilayer Ceramic Capacitor
EDLC	Electric Double Layer Capacitor

In patent documents, the following words/expressions are often used as synonyms:

- "capacitor" and "condenser"
- "supercapacitor", "ultracapacitor", "electrochemical capacitor" and "electric double layer capacitor"
- "multilayer capacitor" and "stacked capacitor"

H01G 9/20

Light-sensitive devices

Definition statement

This place covers:

Photoelectrochemical cells based on junctions between an inorganic semiconductor and an electrolyte

Photoelectrochemical cells based on a dye dissolved in the electrolyte or adsorbed on an electrode

References

Limiting references

This place does not cover:

Solid state light sensitive devices using an inorganic semiconductor as the active part	H01L 31/00
Solid state light sensitive devices using an organic semiconductor as the active part	H01L 51/42
Photo electrochemical storage cells	H01M 14/005

Special rules of classification

In this group, documents are classified according to the ECLA Reform approach, i.e. "invention information" is identified with ECLA classification symbols, e.g. [H01G 9/2031](#), while "additional information" is identified with Indexing Code symbols, e.g. [H01G 9/2059](#).

In this subclass, Indexing Codes are mainly attributed with a view to allow retrieval of documents comprising a combination of technical characteristics, some of them being unimportant per se, and, hence, identified with an Indexing Code symbol rather than with the corresponding ECLA one-potential-jump barrier or surface barrier.

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

DSSC	dye sensitized solar cell
PEC	photo electrochemical cell

H01G 9/2004

{characterised by the electrolyte, e.g. comprising an organic electrolyte}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Primary cells with non-aqueous electrolyte	H01M 6/14
Accumulators with non-aqueous electrolyte	H01M 10/05

H01G 9/2027

{comprising an oxide semiconductor electrode}

Definition statement

This place covers:

Photo electrochemical cells having an oxide semiconductor as working electrode or having oxide semiconductor particles dispersed in the electrolyte;

examples of oxide semiconductors are: zinc oxide [ZnO], tungsten trioxide [WO₃], copper oxide [CuO], niobium pent oxide [Nb₂O₅]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Zinc oxides	C01G 9/02
Tungsten oxides	C01G 41/02

H01G 9/2031

{comprising titanium oxide, e.g. TiO₂ ([H01G 9/2036](#) takes precedence)}

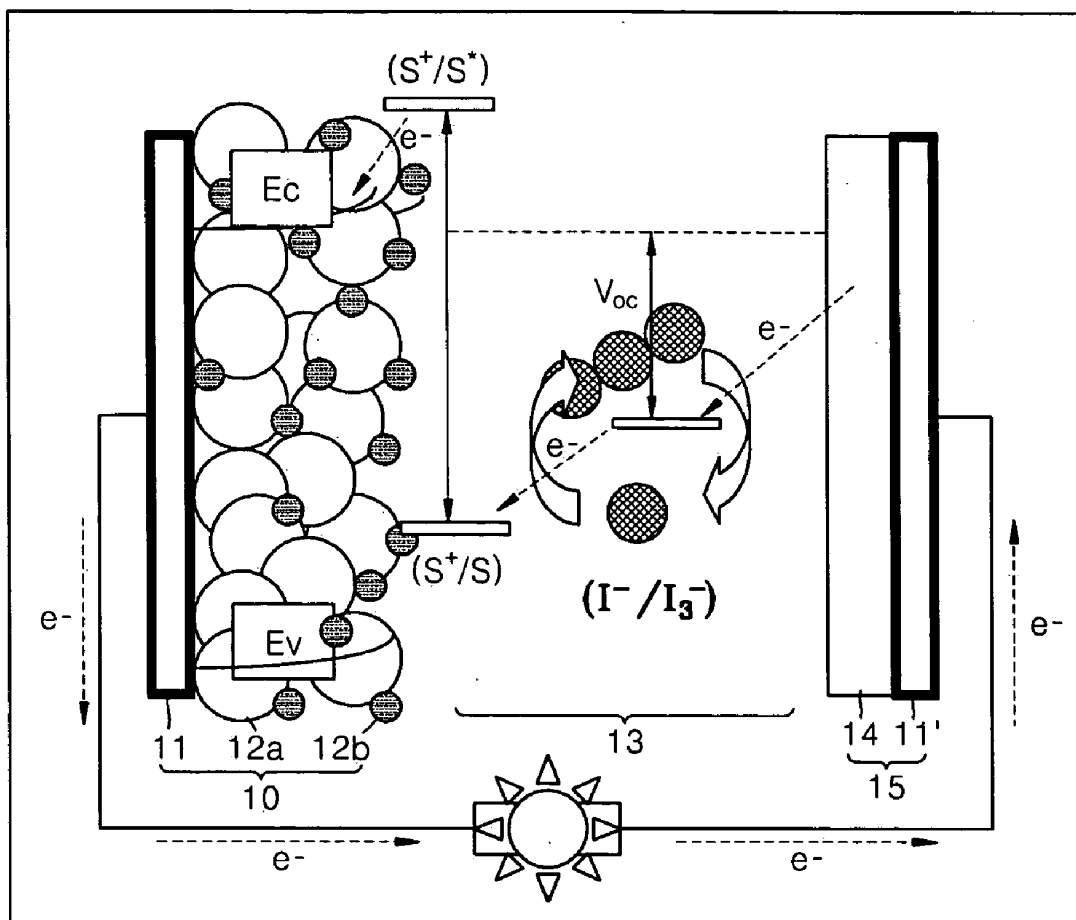
Definition statement

This place covers:

Dye sensitized solar cells; the sensitizer may be a dye (organic) or an inorganic pigment, e.g. PbSe nanoparticles.

Working principle of a dye sensitized solar cell

Illustrative example of subject matter classified in this group.I



US2009173381

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Titanium oxides	C01G 23/04
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H01G 9/2054

{comprising a semiconductor electrode comprising All-BVI compounds, e.g. CdTe, CdSe, ZnTe, ZnSe, with or without impurities, e.g. doping materials ([H01G 9/2027](#) takes precedence)}

References

Limiting references

This place does not cover:

Light sensitive devices comprising an oxide semiconductor electrode	H01G 9/2027
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H01G 9/2068

{Panels or arrays of photoelectrochemical cells, e.g. photovoltaic modules based on photoelectrochemical cells}

Definition statement

This place covers:

- Serial interconnection of photoelectrochemical cells;
- sealing of photoelectrochemical cells;
- dye sensitized solar cells in form of a fibre;
- special provisions for filling the photoelectrochemical cell with the electrolyte or dyeing solution.