EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 48

DATE: DECEMBER 1, 2014

PROJECT RP0070

The following classification changes will be effected by this Notice of Changes:

Action	**Subclass**	**Group(s)**
Symbols deleted:	G01R	31/2605
	G01R	31/405
	H01L	25/045
	H01L	27/1422
	H01L	27/1423
	H01L	27/1425
	H01L	27/1426
	H01L	27/1427
	H01L	27/1428
	H01L	31/0406
	H01L	31/0413
	H01L	31/0422
	H01L	31/0424
	H01L	31/0426
	H01L	31/0428
	H01L	31/045
	H01L	31/0482
	H01L	31/0483
	H01L	31/0484
	H01L	31/0485
	H01L	31/0486
	H01L	31/0487
	H01L	31/0522
	H01L	31/0524
	H01L	31/0527
	H01L	31/0528
	H01L	31/058
	H01L	31/0583
	H01L	31/0586
	H02N	6/00
New symbols:	H01L	31/041
	H01L	31/043
	H01L	31/044
	H01L	31/0443
	H01L	31/0445
	H01L	31/046
	H01L	31/0463
	H01L	31/0465
	H01L	31/0468

	H01L	31/047
	H01L	31/0475
	H01L	31/049
	H01L	31/053
	H01L	31/054
	H01L	31/0543
	H01L	31/0547
	H01L	31/0549
	H01L	31/056
	H02S	10/10
	H02S	10/12
	H02S	10/20
	H02S	10/30
	H02S	10/40
	H02S	20/10
	H02S	20/20
	H02S	20/21
	H02S	20/22
	H02S	20/23
	H02S	20/24
	H02S	20/25
	H02S	20/26
	H02S	20/30
	H02S	20/32
	H02S	30/10
	H02S	30/20
	H02S	40/10
	H02S	40/12
	H02S	40/20
	H02S	40/22
	H02S	40/30
	H02S	40/32
	H02S	40/34
	H02S	40/345
	H02S	40/36
	H02S	40/38
	H02S	40/40
	H02S	40/42
	H02S	40/425
	H02S	40/44
	H02S	50/10
	H02S	50/15
Title Change:	F24J	2/00
	F24J	2/38
	G01R	31/26
	G01R	31/40
	H01L	25/00
	H01L	27/142
	H01L	31/02021

	H01L	31/0203
	H01L	31/0216
	H01L	31/0232
	H01L	31/024
	H01L	31/04
	H01L	31/042
	H01L	31/048
	H01L	31/05
	H01L	31/052
	H01L	31/0525
	H01L	31/055
	H02S	30/00
Indent Change:	H01L	31/052
	H01L	31/0521
Scheme Warning Notices to be added/modified/deleted:	E04D	Warning
	H02S	Below subclass title (deleted)
	H02S	10/00 (added)
	H02S	20/00 (added)
	H02S	30/00 (added)
	H02S	40/00 (added)
	H02S	50/00 (added)
Scheme Notes to be added/modified/deleted:	F24J	2/00 (added)
	H02S	20/00 (added)

The following subclasses/groups are also impacted by this Notice of Changes: B63B, C25B, E01F, E04D, F16M, and G01M.

This Notice of Changes includes the following *[Check the ones included]:*

1. CLASSIFICATION SCHEME CHANGES
   - ☒ A. New, Modified or Deleted Group(s)
   - ☒ B. New, Modified or Deleted Warning Notice(s)
   - ☒ C. New, Modified or Deleted Note(s) or Guidance Heading(s)
2. DEFINITIONS (New or Modified)
   - ☒ A. DEFINITIONS (Full definition template)
   - ☒ B. DEFINITIONS (Definitions Quick Fix)
3. ☒ REVISION CONCORDANCE LIST (RCL)
4. ☒ CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

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PROJECT RP0070

1. CLASSIFICATION SCHEME CHANGES

A. New, Deleted, and Modified group(s)

SUBCLASS F24J – PRODUCTION OR USE OF HEAT NOT OTHERWISE PROVIDED FOR

Type*	Symbol	Indent Level	Title
C	F24J 2/00		**Use of solar heat, e.g. solar heat collectors** (distillation or evaporation of water using solar energy C02F 1/14; devices for producing mechanical power from solar energy F03G 6/00; semiconductor devices specially adapted for converting solar energy into electrical energy H01L 31/00; photovoltaic [PV] cells including means directly associated with the PV cell to utilise heat energy H01L 31/0525; PV modules including means associated with the PV module to utilise heat energy H02S 40/44)
C	F24J 2/38	1	employing tracking means (F24J 2/02, F24J 2/06 take precedence; rotary supports or mountings therefor F24J 2/54; supporting structures of photovoltaic modules for generation of electric power specially adapted for solar tracking systems H02S 20/32)

*N = new entries (reclassification involved); C = entries with modified file scope (reclassification involved); M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen/entries (deleted pending reclassification completion); U = entries that are unchanged

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SUBCLASS G01R – MEASURING ELECTRIC VARIABLES; MEASURING MAGNETIC VARIABLES

Type*	Symbol	Indent Level	Title
C	G01R 31/26	1	Testing of individual semiconductor devices (testing or measuring during manufacture or treatment H01L 22/00; testing of photovoltaic devices H02S 50/10)
D	G01R 31/2605	3	< administrative transfer to H02S50/10 >
C	G01R 31/40	1	Testing power supplies (testing photovoltaic devices H02S 50/10{; comparing current or voltage with a reference level in AC or DC supplies G01R19/16538})
D	G01R 31/405	2	< administrative transfer to H02S50/10 >

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SUBCLASS H01L – SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR

Type*	Symbol	Indent Level	Title
M	H01L 25/00		**Assemblies consisting of a plurality of individual semiconductor or other solid state devices{; Multistep manufacturing processes thereof} ({lead frames with assemblies of semiconductor devices thereon H01L23/49575; assembling semiconductor devices using processes or apparatus not provided for in a single one of the subgroups H01L21/06 to H01L21/326, e.g. sealing of a cap to a base of a container, H01L21/50;} devices consisting of a plurality of solid state components formed in or on a common substrate H01L27/00; photovoltaic modules or arrays of photovoltaic cells H01L31/042{, H01G9/20})**
D	H01L 25/045	5	< administrative transfer to H01L31/043 >
C	H01L 27/142	2	Energy conversion devices (photovoltaic modules or arrays of single photovoltaic cells comprising bypass diodes integrated or directly associated with the devices H01L 31/0443; photovoltaic modules composed of a plurality of thin film solar cells deposited on the same substrate H01L 31/046)
D	H01L 27/1422	3	< administrative transfer to H01L31/0475 >
D	H01L 27/1423	4	< administrative transfer to H01L31/046 >
D	H01L 27/1425	5	< administrative transfer to H01L31/0463 >
D	H01L 27/1426	5	< administrative transfer to H01L31/0465 >
D	H01L 27/1427	5	< administrative transfer to H01L31/0468 >
D	H01L 27/1428	4	< administrative transfer to H01L31/047 >
C	H01L31/02021	4	{for solar cells (Electrical connection means, e.g. junction boxes, specially adapted for structural association with photovoltaic modules H02S 40/34)}
C	H01L 31/0203	2	Containers; Encapsulations, {e.g. encapsulation of photodiodes} (for photovoltaic devices H01L 31/048; for organic photosensitive devices H01L 51/44)
C	H01L 31/0216	2	Coatings (H01L 31/041 takes precedence)
C	H01L 31/0232	2	Optical elements or arrangements associated with the device (H01L 31/0236 takes precedence; for photovoltaic cells H01L 31/054; for photovoltaic modules H02S 40/20)
C	H01L 31/024	2	Arrangements for cooling, heating, ventilating or temperature compensation (for photovoltaic devices H01L 31/052)

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C	H01L 31/04	1	adapted as photovoltaic [PV] conversion devices, e.g. PV modules or single PV cells (testing thereof during manufacture {H01L 22/00}; testing thereof after manufacture H02S 50/10)
D	H01L 31/0406	2	< administrative transfer to H02S10/30 >
N	H01L 31/041	2	Provisions for preventing damage caused by corpuscular radiation, e.g. for space applications
D	H01L 31/0413		< administrative transfer to H01L31/041 >
C	H01L 31/042	2	PV modules or arrays of single PV cells (supporting structures for PV modules H02S 20/00)
D	H01L 31/0422	3	< administrative transfer to H02S20/00 >
D	H01L 31/0424	4	< administrative transfer to H02S30/10 >
D	H01L 31/0426	3	< administrative transfer to H02S20/21 >
D	H01L 31/0428	3	< administrative transfer to H02S40/32 >
N	H01L 31/043	3	Mechanically stacked PV cells
N	H01L 31/044	3	including bypass diodes (bypass diodes in the junction box H02S 40/34)
N	H01L 31/0443	4	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
N	H01L 31/0445	3	including thin film solar cells, e.g. single thin film a-Si, CIS or CdTe solar cells
D	H01L 31/045	3	< administrative transfer to H02S30/20 >
N	H01L 31/046	4	PV modules composed of a plurality of thin film solar cells deposited on the same substrate
N	H01L 31/0463	5	characterised by special patterning methods to connect the PV cells in a module, e.g. laser cutting of the conductive or active layers
N	H01L 31/0465	5	comprising particular structures for the electrical interconnection of adjacent PV cells in the module (H01L 31/0463 takes precedence)
N	H01L 31/0468	5	comprising specific means for obtaining partial light transmission through the module, e.g. partially transparent thin film solar modules for windows
N	H01L 31/047	3	PV cell arrays including PV cells having multiple vertical junctions or multiple V-groove junctions formed in a semiconductor substrate
N	H01L 31/0475	3	PV cell arrays made by cells in a planar, e.g. repetitive, configuration on a single semiconductor substrate; PV cell microarrays (PV modules composed of a plurality of thin film solar cells deposited on the same substrate H01L 31/046)
C	H01L 31/048	3	Encapsulation of modules
D	H01L 31/0482	4	< administrative transfer to H02S20/23 >

D	H01L 31/0483	5	< administrative transfer to H02S20/25 >
D	H01L 31/0484	5	< administrative transfer to H02S20/24 >
D	H01L 31/0485	4	< administrative transfer to H02S40/34 >
D	H01L 31/0486	5	< administrative transfer to H02S40/345 >
D	H01L 31/0487	4	< administrative transfer to H01L31/049 >
N	H01L 31/049	4	Protective back sheets
C	H01L 31/05	3	Electrical interconnection means between PV cells inside the PV module, e.g. series connection of PV cells (electrodes H01L 31/0224; electrical interconnection of thin film solar cells formed on a common substrate H01L 31/046; particular structures for electrical interconnecting of adjacent thin film solar cells in the module H01L 31/0465; electrical interconnection means specially adapted for electrically connecting two or more PV modules H02S 40/36)
C	H01L 31/052	2	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)
C	H01L 31/0521	3	{using a gaseous or a liquid coolant, e.g. air flow ventilation, water circulation}
D	H01L 31/0522	4	< administrative transfer to H01L31/054 >
D	H01L 31/0524	5	< administrative transfer to H01L31/0543 >
C	H01L 31/0525	3	including means to utilise heat energy directly associated with the PV cell, e.g. integrated Seebeck elements
D	H01L 31/0527	5	< administrative transfer to H01L31/056 >
D	H01L 31/0528	5	< administrative transfer to H01L31/0549 >
N	H01L 31/053	2	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)
N	H01L 31/054	2	Optical elements directly associated or integrated with the PV cell, e.g. light-reflecting means or light-concentrating means
N	H01L 31/0543	3	{comprising light concentrating means of the refractive type, e.g. lenses}
N	H01L 31/0547	3	{comprising light concentrating means of the reflecting type, e.g. parabolic mirrors, concentrators using total internal reflection}
N	H01L 31/0549	3	{comprising spectrum splitting means, e.g. dichroic mirrors}
C	H01L 31/055	3	where light is absorbed and re-emitted at a different wavelength by the optical element directly associated or integrated with the PV cell, e.g. by using luminescent material, fluorescent concentrators or up-conversion arrangements
N	H01L 31/056	3	the light-reflecting means being of the back surface reflector [BSR] type
D	H01L 31/058	3	< administrative transfer to H02S40/44 >
D	H01L 31/0583	4	< administrative transfer to H02S10/10 >

D	H01L 31/0586	4	< administrative transfer to H02S 40/38 >

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SUBCLASS H02N – ELECTRIC MACHINES NOT OTHERWISE PROVIDED FOR

Type*	Symbol	Indent Level	Title
D	H02N 6/00		< administrative transfer to H02S 99/00 >

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SUBCLASS H02S – Generation of electric power by conversion of infra-red radiation, visible light or ultraviolet light, e.g. using photovoltaic [PV] modules

Type*	Symbol	Indent Level	Title
C	H02S 10/00		PV power plants; Combinations of PV energy systems with other systems for the generation of electric power
N	H02S 10/10	1	including a supplementary source of electric power, e.g. hybrid diesel-PV energy systems (combinations with gas-turbine plants F02C 6/00)
N	H02S 10/12	2	Hybrid wind-PV energy systems
N	H02S 10/20	1	Systems characterised by their energy storage means(H02S 40/38 takes precedence)
N	H02S 10/30	1	Thermophotovoltaic systems (photovoltaic cells specially adapted for conversion or sensing of infra-red [IR] radiation H01L 31/00; thermoelectric devices H01L 35/00)
N	H02S 10/40	1	Mobile PV generator systems
C	H02S **20/00**		**Supporting structures for PV modules**
N	H02S 20/10	1	Supporting structures directly fixed to the ground (H02S 20/30 takes precedence)

N	H02S 20/20	1	Supporting structures directly fixed to an immovable object (H02S 20/30 takes precedence)
N	H02S 20/21	2	specially adapted for motorways, e.g. integrated with sound barriers
N	H02S 20/22	2	specially adapted for buildings
N	H02S 20/23	3	specially adapted for roof structures
N	H02S 20/24	4	specially adapted for flat roofs
N	H02S 20/25	4	Roof tile elements
N	H02S 20/26	3	Building materials integrated with PV modules, e.g. façade elements (H02S 20/25 takes precedence)
N	H02S 20/30	1	Supporting structures being movable or adjustable, e.g. for angle adjustment
N	H02S 20/32	2	specially adapted for solar tracking
C	H02S **30/00**		Structural details of PV modules other than those related to light conversion (semiconductor device aspects of modules of electrolytic light sensitive devices H01G 9/20, of inorganic PV modules H01L 31/00, of organic PV modules H01L 51/42)
N	H02S 30/10	1	Frame structures
N	H02S 30/20	1	Collapsible or foldable PV modules
C	H02S **40/00**		Components or accessories in combination with PV modules, not provided for in groups H02S 10/00-H02S 30/00
N	H02S 40/10	1	Cleaning arrangements
N	H02S 40/12	2	Means for removing snow
N	H02S 40/20	1	Optical components
N	H02S 40/22	2	Light-reflecting or light-concentrating means (directly associated with the PV cell or integrated with the PV cell H01L 31/054)
N	H02S 40/30	1	Electrical components
N	H02S 40/32	2	comprising DC/AC inverter means associated with the PV module itself, e.g. AC modules
N	H02S 40/34	2	comprising specially adapted electrical connection means to be structurally associated with the PV module, e.g. junction boxes
N	H02S 40/345	3	{with cooling means associated with the electrical connection means, e.g. cooling means associated with or applied to the junction box (cooling means for PV cells H01L31/052, for PV modules H02S40/42)}
N	H02S 40/36	2	characterised by special electrical interconnection means between two or more PV modules, e.g. electrical module-to-module connection
N	H02S 40/38	2	Energy storage means, e.g. batteries, structurally associated with PV modules
N	H02S 40/40	1	Thermal components (H02S 10/30 takes precedence)
N	H02S 40/42	2	Cooling means (cooling means directly associated or integrated with the PV cell H01L 31/052)

N	H02S 40/425	3	{using a gaseous or a liquid coolant, e.g. air flow ventilation, water circulation}
N	H02S 40/44	2	Means to utilise heat energy, e.g. hybrid systems producing warm water and electricity at the same time (directly associated with the PV cell or integrated with the PV cell H01L 31/0525)
C	H02S **50/00**		**Monitoring or testing of PV systems, e.g. load balancing or fault identification**
N	H02S 50/10	1	Testing of PV devices, e.g. of PV modules or single PV cells(testing of semiconductor devices during manufacturing {H01L 22/00})
N	H02S 50/15	2	using optical means, e.g. using electroluminescence

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B. New, Deleted, and Modified Warning notice(s)

SUBCLASS H02S – Generation of electric power by conversion of infra-red radiation, visible light or ultraviolet light, e.g. using photovoltaic [PV] modules

Type*	Location	Old Warning notice	New/Modified Warning notice
M	E04D	The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups: E04D3/3645 covered by E04D3/363 E04D3/367 " " E04D3/364 E04D13/18 " " F24J2/00, H01L31/0482	The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups: E04D3/3645 covered by E04D3/363 E04D3/367 " " E04D3/364 E04D13/18 " " F24J2/00, H02S20/23
D	H02S	corresponds to IPC2014.01. Concordance CPC : IPC for the groups is as follows: - H02S10/00 : H01L31/04 – H02S20/00 : H01L31/042 – H02S30/00 : H01L31/042 – H02S40/00 : H01L31/042 – H02S50/00 : G01R31/40 – H02S99/00 : H02N6/00]	
N	H02S 10/00		Groups H02S 10/10 - H02S 10/40 are incomplete pending reclassification of documents from group H02S 10/00. Until reclassification is complete, group H02S 10/00 should be considered in order to perform a complete search.
N	H02S 20/00		Groups H02S 20/10 – H02S 20/32 are incomplete pending reclassification of documents from group(s) H02S 20/00, F24J 2/00, F24J 2/38, and H01L 31/048. Until reclassification is complete, groups H02S 20/00, F24J 2/00, F24J 2/38, and H01L 31/048 should be considered in order to perform a complete search.
N	H02S 30/00		Groups H02S 30/10 and H02S 30/20 are incomplete pending reclassification of documents from group H02S 30/00. Until reclassification is complete, group H02S 30/00 should be considered in order to perform a complete search.
N	H02S 40/00		Group(s) H02S 40/10 – H02S 40/44 are incomplete pending reclassification of documents from groups H02S 40/00, F24J 2/00, H01L 31/0232, H01L 31/05 – 31/055. Until reclassification is complete, groups H02S 40/00, F24J 2/00, H01L 31/0232, H01L 31/05 – H01L 31/055 should be considered in order to perform a complete search.

N	H02S 50/00		Groups H02S 50/10 – H02S 50/15 are incomplete pending reclassification of documents from group H02S 50/00. Until reclassification is complete, group H02S 50/00 should be considered in order to perform a complete search.

*N = new warning, M = modified warning, D = deleted warning

C. New, Deleted, and Modified Note(s)

SUBCLASS F24J – PRODUCTION OR USE OF HEAT NOT OTHERWISE PROVIDED FOR

Type*	Location	Old Note	New/Modified Note
N	F24J 2/00		Supporting structures also intended for use with photovoltaic modules should further be classified in the relevant groups of subclass H02S.

*N = new note, M = modified note, D = deleted note

SUBCLASS H02S – Generation of electric power by conversion of infra-red radiation, visible light or ultraviolet light, e.g. using photovoltaic [PV] modules

Type*	Location	Old Note	New/Modified Note
N	H02S 20/00		Supporting structures also intended for use with solar heat collectors should also be classified in groups F24J 2/38 or F24J 2/52.

*N = new note, M = modified note, D = deleted note

2. A. DEFINITIONS (i.e. new or modified)

F24J 2/00

Use of solar heat, e.g. solar heat collectors (distillation or evaporation of water using solar energy C02F 1/14; roof covering aspects of energy collecting devices E04D 13/18; devices for producing mechanical power from solar energy F03G 6/00; semiconductor devices adapted for converting solar energy into electrical energy H01L 31/00; semiconductor devices including solar cells using heat energy H01L 31/0525; photovoltaic [PV] modules including means to utilise heat energy directly associated with the PV module H02S 40/44)

Definition statement

This subclass/group covers:

Thermal solar collectors, e.g. solar stoves, solar heat collectors having working fluid conveyed through collector, thermal solar collectors integrated into a building, solar collectors using pools or ponds, solar collectors comprising a heat-exchanger.

Solar concentrators, e.g. systems that use lenses or mirrors to concentrate a large area of sunlight, or solar thermal energy, onto a small area; solar receivers, e.g. energy conversion devices that convert the concentrated solar energy into useful heat.

Solar collectors having particular type of channels for the working fluid, e.g. plate-like solar collectors, tubular solar collectors, trickle solar collectors.

Heat-pipe solar collectors; heat storage integrated to solar collectors, e.g. solar hot water storage.

Solar tracking means, solar position control means, integration of sensors into supports, means for calibrating solar concentrators.

Control arrangements, e.g. temperature control, controlling transmission of solar heat; safety means, e.g. responsive to wind.

Component parts, details of solar collectors, e.g. flow guiding means, protective covers, casings, means for cleaning, means for interconnecting solar collectors, sealing means, means for preventing corrosion or protecting against contaminants, means for overtemperature protection, means for protection against freezing, means for draining, means for allowing thermal expansion.

Particular absorber materials, particular absorber coatings.

Transparent coverings.

Thermal insulation.

Arrangements of supports or mountings, e.g. stationary supports, profiles or rails for mounting solar modules, stands; supports adapted for reciprocating movement; waterborne solar collectors, airborne solar collectors, supports specially adapted for rotary movement.

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Relationship between large subject matter areas

Roof covering aspects of solar energy are classified in subgroups of F24J2/00, not in E04D.

Solar heat systems not otherwise provided for are classified in F24J2/42, e.g. solar collectors having natural or thermosiphonic circulation.

Hybrid systems, e.g. solar modules including both thermal and photovoltaic energy recovery are classified in H02S40/44, not in F24J.

References relevant to classification in this group

This group does not cover:

Distillation or evaporation of water using solar energy	C02F 1/14
Devices for producing mechanical power from solar energy	F03G 6/00
Solar chimneys producing an updraft of heated gas, e.g. air driving an engine	F03G 6/04
Water or air heating systems combined with solar energy	F24D 11/00
Heat pump systems combined with solar energy	F24D11/02
Semiconductor devices adapted for converting solar energy into electrical energy	H01L 31/00
Semiconductor devices including means to utilise heat energy directly associated with the PV cell	H01L 31/0525
PV modules including means to utilise heat energy directly associated with the PV module	H02S 40/44

Informative references

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

Collecting solar energy for greenhouses	A01G9/24
Footwear with heating arrangements	A43B7/02
Disinfection, sterilisation or deodorisation of air	A61L9/03
Chemical processes with heating of the reactor	B01J8/06
Chemical reactors using sunlight	B01J19/12
Protection against solar radiation in cosmonautics	B64G1/54
Coating of glass	C03C17/00
Joining glass to metal	C03C17/00
Materials undergoing chemical reactions when used	C09K5/16
Coating metallic materials	C23C
Coating by spraying	C23C4/00
Coating by vacuum evaporation, by physical vapour deposition	C23C14/00
Electrolytic coating	C25D
Three-dimensional framework structures	E04B1/19
Thermal insulation for buildings	E04B1/74
Vacuum insulating panels	E04B1/80
Thin building elements with heating or cooling conduits	E04C2/52
Fasteners for roof coverings	E04D1/34
Roof coverings	E04D3/06, E04D3/08

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Roof metal glazing bars	E04D3/24
Corrugated roofs	E04D3/30
Roof walkways	E04D13/12
Systems for heating the water content of swimming pools	E04H4/12
Towers, masts, poles	E04H12/00
Windows	E06B
Protective devices against sunshine for buildings	E06B9/24
Using heat from a specified chemical reaction in steam plants	F01K3/18
Gas-turbine plants using solar energy	F02C1/05
Wind motors combined with solar conversion means	F03D9/00
Fasteners in general	F16B
Domestic hot water supply systems or recuperated waste heat systems or conventional heaters, combined with solar energy	F24D17/00
Drying by using solar heat	F26B3/28
Generators in which light radiation is directly converted into electrical energy	H02S 99/00
Clamps	F16B2/02, F16B2/06
Joining plates to one another	F16B5/00
Connection of rods or tubes mutually	F16B7/00
Connection of rods or tubes to flat surfaces	F16B9/00
Valves	F16K
Pipes	F16L
Frames, casings or beds for engines, machines; Stands or supports	F16M
Lighting devices using daylight	F21S11/00
Reflectors for lighting devices	F21V7/00
Steam generators using solar energy	F22B1/00
Air conditioning using solar energy	F24F5/00
Refrigeration systems using solar energy	F25B27/00
Heat exchange apparatus	F28D
Details of heat transfer	F28F
Direction finders for determining the direction from which electromagnetic waves are being received	G01S3/78
Optics	G02B
Reflective coatings	G02B1/10
Antireflection coatings	G02B1/11
Simple or compound lenses	G02B3/00
Mirrors	G02B5/08
Light guides	G02B6/00
Mountings for mirrors	G02B7/182
Mounting adapted for very large mirrors	G02B7/183
Systems with reflecting surfaces, with or without refracting elements	G02B17/00
Electro-optical glazing	G02F1/13
Supports for aerials	H01Q1/12
Orientation of aerials	H01Q3/08
Supporting structures for photovoltaic devices	H02S 20/00
Photovoltaic devices specially adapted for house roof structures, e.g. roof tile elements	H02S 20/23

Light concentrating means for photovoltaic devices	H01L31/054
Light concentrating means for photovoltaic modules	H02S 40/22

Special rules of classification within this group

Supporting structures also intended for use with photovoltaic modules should further be classified in subclass H02S

F24J 2/38

employing tracking means (F24J 2/02, F24J 2/06 take precedence; rotary supports or mountings therefor F24J 2/54; supporting structures of photovoltaic modules for generation of electric power specially adapted for solar tracking systems H02S 20/32)

References relevant to classification in this group

This group does not cover:

Solar heat collectors with support for article heated, e.g. stoves, ranges, crucibles, furnaces or ovens using solar heat	F24J 2/02
Solar heat collectors having concentrating elements	F24J 2/06
Rotary supports or mountings therefor	F24J 2/54
Supporting structures of photovoltaic modules for generation of electric power specially adapted for solar tracking systems	H02S 20/32

Informative references

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

Direction- finders for determining the direction from which electromagnetic waves are being received	G01S 3/78
Control of position or direction	G05D 3/00

G01R 31/26

Testing of individual semiconductor devices (testing or measuring during manufacture or treatment H01L 22/00; testing of photovoltaic devices H02S 50/10)

References relevant to classification in this group

This group does not cover:

Testing or measuring during manufacture or treatment	H01L 22/00
Testing of photovoltaic devices	H02S 50/10

Informative references

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

Measurement of impurity content of materials	G01N

Testing of integrated circuits	G01R 31/28

Glossary of terms

In this group, the following expression is used with the meaning indicated:

Individual semiconductor device	Basic semiconductor component or building block such as a diode or a transistor

G01R 31/40

Testing power supplies (testing photovoltaic devices H02S 50/10)

References relevant to classification in this group

This group does not cover:

Testing photovoltaic devices	H02S 50/10

H01L 25/00

Assemblies consisting of a plurality of individual semiconductor or other solid state devices {; Multistep manufacturing processes thereof} ({ lead frames with assemblies of semiconductor devices thereon H01L23/49575; assembling semiconductor devices using processes or apparatus not provided for in a single one of the subgroups H01L21/06 to H01L21/326 , e.g. sealing of a cap to a base of a container, H01L21/50}; devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00; photovoltaic modules or arrays of photovoltaic cells H01L 31/042 {, H01G 9/20})

References relevant to classification in this group

This group does not cover:

Assemblies of semiconductor devices on lead-frames	H01L23/49575
Devices consisting of a plurality of solid state components formed in or on a common substrate	H01L 27/00
Photovoltaic modules or arrays of photovoltaic cells	H01L 31/042
Tandem solar cells, meaning monolithically integrated solar cells with different wavelengths sensibilities deposited on one another by coating processes	H01L31/0687, H01L31/0725, H01L31/076, and H01L31/078
Assemblies of photo electrochemical cells, e.g. dye sensitised solar cells	H01G9/2068

Informative references

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

Leads on insulating substrates (chip carriers)	H01L 23/498
Interconnection structures for a plurality of bare semiconductor chips provided on or in an insulating substrate	H01L 23/538

Arrangements for connecting or disconnecting semiconductor or solid-state bodies; methods related thereto	H01L24/00
Integrated photodetecting devices on a substrate	H01L27/146
Integration of organic light emitting devices (OLEDs), e.g. OLED displays	H01L27/32
Light sensitive devices structurally associated with, e.g. formed in or on a common substrate with, one or more electric light sources, and electrically or optically coupled thereto (e.g. opto-couplers)	H01L31/12
Organic light emitting devices [OLEDs]	H01L51/50
Static Stores	G11C
Couplings of light guides with optoelectronic elements	G02B 6/42
Generators using solar cells or photovoltaic modules	H02S
Details of complete circuit assemblies provided for in another subclass, e.g. details of television receivers, see the relevant subclass, e.g. H04N	H04N
Details of assemblies of electrical components in general	H05K

Special rules of classification within this main group

The classification of additional information is mandatory in this main group.

Glossary of terms

Assembly of a Device	The “assembly” of a device is the building up of the device from its component constructional units and includes the provision of fillings in containers.

H01L 27/142

Energy conversion devices (photovoltaic modules or arrays of single photovoltaic cells comprising bypass diodes integrated or directly associated with the devices H01L 31/0443; photovoltaic modules composed of a plurality of thin film solar cells deposited on the same substrate H01L 31/046)

Definition statement

This group covers:

1. Single discrete photovoltaic cells integrated or directly associated with one or more electric components in or on the same substrate, e.g. single thin film photovoltaic cell with integrated bypass diode.
2. Devices consisting of PV cells and other semiconductor components, e.g. transistors, on a common substrate, typically PV cells being used as an energy source to drive the other semiconductors.
3. *Examples*:

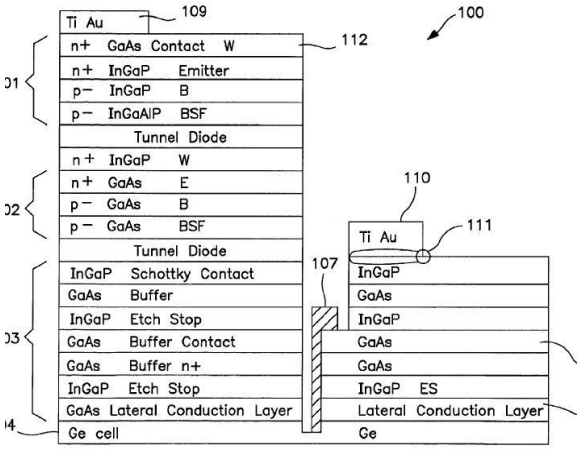
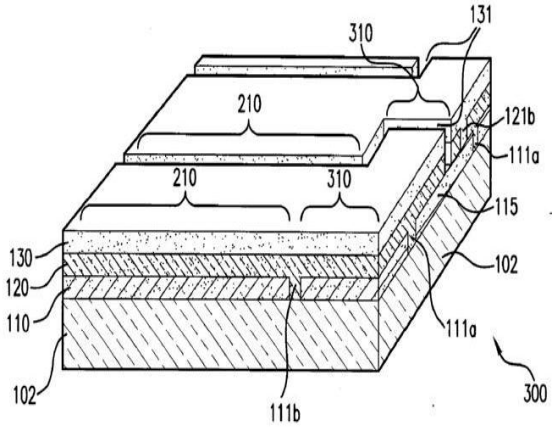


FIG. 1



References relevant to classification in this group

This group does not cover:

Photovoltaic modules or arrays of single photovoltaic cells comprising bypass diodes integrated or directly associated with the devices	H01L 31/0443
Photovoltaic modules composed of a plurality of thin film solar cells deposited on the same substrate	H01L 31/046

Informative references

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

Circuitry connections of bypass diodes in solar panel(s)	H01L31/05
Solar cell structures	H01L31/06- H01L31/078
Semiconductor organic solar cells	H01L51/42

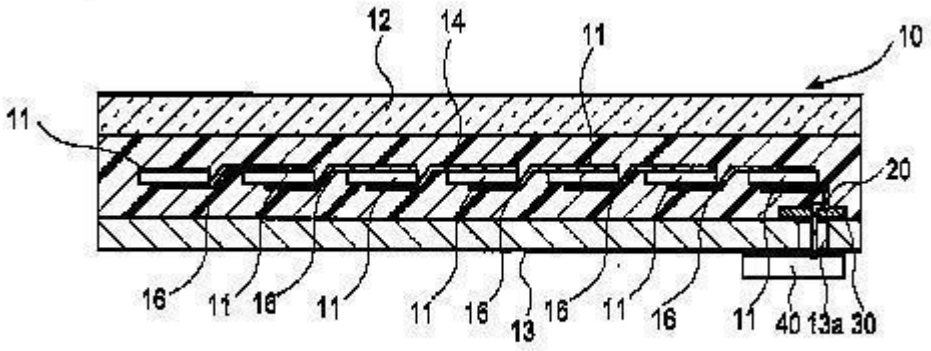
H01L 31/02008

{for solar cells or solar cell modules}

Definition statement

This subclass/group covers:

Special electrical connections of a solar cell or a solar module, i.e. to conduct electrical current to an external load**.**



contact terminal 40

Informative references

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

Connection between cells within a module for bulk solar cells	H01L31/05
Connection between cells within a module for thin film solar cells	H01L31/046
Electrical connection means, e.g. junction boxes, specially adapted for structural association with photovoltaic modules	H02S40/34
Wiring substrates, e.g. for back contacted solar cells	H01L31/0516

H01L 31/02021

{for solar cells (Electrical connection means, e.g. junction boxes, specially adapted for structural association with photovoltaic modules H02S 40/34)**}**

References relevant to classification in this group

This group does not cover:

Electrical connection means, e.g. junction boxes, specially adapted for structural association with photovoltaic modules	H02S 40/34

Informative references

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

MPPT systems	G05F1/67
Circuitry associated to or formed in the module, e.g. bypass diodes associated with the serial interconnection between cells of the module	H01L31/044. H01L31/05

H01L 31/0203

Containers; Encapsulations (for photovoltaic devices H01L 31/048; for organic photosensitive devices H01L 51/448)

Definition statement

This group covers:
Packaging aspects for single photosensitive components: Housing, transparent windows, resins.

References relevant to classification in this group

This group does not cover:

Housing / encapsulation for photovoltaic devices	H01L 31/048
Containers / encapsulation for organic photosensitive devices	H01L 51/448

Informative references

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

Containers not specific to light sensitive devices (microelectronic)	H01L 23/02
Assemblies consisting of a plurality of individual semiconductor or other solid state devices, e.g. the devices having separate containers	H01L 25/00
Optical elements or arrangements associated with semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength specially adapted for the control of electrical energy by such radiation	H01L 31/0232
Optical elements directly associated or integrated with the PV cell	H01L 31/054
Light absorption and re-emission at a different wavelength by the optical element directly associated or integrated with the PV cell, e.g. luminescent sheets for up or down-conversion	H01L 31/055
Packaging for devices classified in H01L 31/14, H01L 31/16	H01L 31/14 H01L 31/16
Semiconductor devices specially adapted for light emission, characterised by the semiconductor body package	H01L 33/48
Encapsulation of organic light emitting devices	H01L51/52
Sealing arrangements of electroluminescent light sources	H05B 33/04

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H01L 31/0216

Coatings (H01L 31/041 takes precedence)

Definition statement

This group covers:

Photosensitive semiconductor devices on which one or more layer(s) are directly deposited – as opposed to "optical elements" which are placed above or upon the device) - e.g. involving electrically passivating properties or optical enhancing properties.

References relevant to classification in this group

This group does not cover:

Provisions for preventing damage caused by corpuscular radiation, e.g. for space applications	H01L 31/041

Informative references

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

Encapsulation of solar cells	H01L31/048
PV devices comprising luminescent layers	H01L 31/055
Luminescent layers for photodetectors	H01L 31/02322
Processes or apparatus specially adapted for the manufacture or treatment of these devices or of parts thereof, e.g. passivation methods	H01L 31/18
Passivation and encapsulation of organic photosensitive devices	H01L 51/448

Special rules of classification within this group

If the layer is texturized, then classify in both (subgroup of) H01L31/0216 and H01L31/0236.

H01L 31/0232

Optical elements or arrangements associated with the device (H01L 31/0236 takes precedence; for photovoltaic cells H01L 31/054; for photovoltaic modules H02S 40/20)

Definition statement

This group covers:
Optical elements used for focusing, reflecting or diffracting light and associated with the photosensitive device.

References relevant to classification in this group

This group does not cover:

Optical elements for photovoltaic cells	H01L 31/054
Surface textures for light trapping effects	H01L 31/0236
Light-reflecting or light-concentrating means specially adapted for PV modules	H02S 40/20

Informative references

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

Imager structures, e.g. micro lenses for CCDs	H01L 27/146

Special rules of classification within this group

Plasmonic structures: if part of Schottky junctions, then see H01L31/1085 (MSM). If purely optical, then here (or H01L31/02322)

H01L 31/024

Arrangements for cooling, heating, ventilating or temperature compensation (for photovoltaic devices H01L 31/052)]

Definition statement

This group covers:

Cooling arrangements for photodetectors

References relevant to classification in this group

This group does not cover:

Cooling arrangements for photovoltaic devices	H01L 31/052

Informative references

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

Cooling apparatuses in general, e.g. arrangement or mounting of refrigeration units	F25D 19/00

H01L 31/04

Adapted as photovoltaic [PV] conversion devices, e.g. PV modules or single PV cells (testing thereof during manufacture H01L22/00; testing thereof after manufacture H02S 50/10)

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Definition statement

This group covers:

Semiconductor devices sensitive to light and adapted for the direct conversion of the light into electrical energy for the purpose of providing electrical energy (not for light detection purposes).

Relationship between large subject matter areas

This group and subgroups do not cover organic light sensitive devices, which are covered by H01L 51/42 as expressed by the limiting reference after H01L 31/00.

This group and subgroups also do not cover electrolytic light sensitive devices, e.g. dye sensitized solar cells, which are covered by H01G 9/20, as expressed by the limiting reference to H01G 9/00 after the sub class title of H01L.

References relevant to classification in this group

This group does not cover:

Testing of PV devices during manufacture	H01L 22/00
Electrolytic light sensitive devices, e.g. dye sensitized solar cells	H01G 9/20
Organic solar cells	H01L 51/42
Testing of PV devices after manufacture	H02S 50/10

Informative references

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

Imager structures consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate	H01L 27/146
Electrodes at the cell level	H01L 31/0224
Devices in which radiation controls flow of current through the device, e.g. photodetectors	H01L 31/08
Production of heat using solar radiation	F24J 2/00
Measurement of X-radiation, gamma radiation, corpuscular radiation or cosmic radiation with semiconductor detectors	G01T 1/24
Measurement of X-radiation, gamma radiation, corpuscular radiation or cosmic radiation with resistance detectors	G01T 1/26
Measurement of neutron radiation with semiconductor detectors	G01T 3/08
Couplings of light guides with optoelectronic elements	G02B 6/42
Arrangement for obtaining electrical energy from radioactive sources	G21H 1/12
Electrochemical current or voltage generators	H01M 6/00- H01M 16/00

Glossary of terms

In this group, the following terms (or expressions) are used with the meaning indicated:

Homojunction	pn junction involving both p and n regions made out of the same material, with the same composition and the same structure (only the doping species change).
Heterojunction	pn junction involving two different materials, the difference lying in the crystal

	structure and/or the composition (example : p-type amorphous silicon / n-type crystalline silicon)
P-i-n structure	P-N junction with thick intrinsic layer in between, whereby the intrinsic interlayer is the major part of the absorbing layer, i.e. not Heterojunction with Intrinsic Thin-layer solar cells
Heterojunction with Intrinsic Thin-layer solar cells	P-N structures including a very thin intrinsic inter-layer, which is not the absorbing layer of the structure
Tandem solar cell	a plurality of junctions are *monolithically* stacked on one another (for lateral integration, see H01L 27/142)
Schottky contact	rectifying (non-ohmic) metal/semiconductor contact
Group 14 elements	formerly known as group IVa elements (C, Si, Ge, Sn, Pb)
Conversion devices	light sensitive devices specially adapted for conversion of light into electrical energy, not for the purpose of light detection
MIS	Metal Insulator Semiconductor

In patent documents the expression "solar cells" is often used with the meaning "photovoltaic cells"

Synonyms and Keywords

In patent documents the following abbreviations are often used:

a-Si, α-Si	amorphous silicon
c-Si	crystalline silicon
mc-Si, muc-Si	microcrystalline silicon
poly-Si	polycrystalline silicon
PIN, p-i-n	P-N junction with thick intrinsic layer in between
AIBIIICVI compound	I-III-VI compound, chalcogenides, chalcopyrites
CIS	CuInSe2
CIGS	CuInGaSe2
CIGSS	CuInGaSSe
TCO	Transparent conducting oxide
ITO	Indium Tin Oxide
AZO	Aluminium doped Zinc Oxide
GZO	Gallium doped Zinc Oxide
QW	Quantum well
MQW	Multiple Quantum Well
HIT	Heterojunction with Intrinsic Thin-layer
PERL solar cell	Passivated Emitter Rear Locally Diffused solar cell
ARC	Anti-reflective coating
MPPT	Maximum Power Point Tracking
MWT	Metal Wrap Through
FMWT	Front Metal Wrap Through
EWT	Emitter Wrap Through
IBC	Interdigitated Back Contact (solar cells)

Special rules of classification within this group

- The group H01L31/04 itself only includes subject-matter where the nature of the light converting material is not clear.
- Devices including photovoltaic cell(s) as power source, wherein the document does not disclose any interesting detail regarding said photovoltaic devices, should be classified in the relevant classes for said device as such.

H01L 31/041

Provisions for preventing damage caused by corpuscular radiation, e.g. for space applications

Definition statement

This group covers:

- Photovoltaic devices specially adapted for space applications.
- Special features to improve the radiation resistance of the PV cell to avoid radiation damage

Informative references

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

Semiconductor devices sensitive to very short wavelengths, e.g. X-rays, gamma-rays or corpuscular radiation	H01L 31/115
Space applications, e.g. power supply for satellites made of solar cell modules	B64G 1/00

H01L 31/042

PV modules or arrays of single PV cells (Supporting structures for PV modules H02S 20/00)

Definition statement

This group covers:

1. PV cell arrays, modules or panels. The PV cells used here are normally of the crystalline-polycrystalline type (bulk cells), e.g. silicon solar cells.
2. Special configuration of the PV cells array,
3. Special electrical connections of the PV cells in a module
4. Circuitry integrated with the PV cells
5. Specific dispositions or shapes of adjacent cells within the module
6. Special configuration or structure of PV modules, adapted for special applications, e.g. solar hats
7. Bypass diodes associated to the interconnections between cells of the module.

References relevant to classification in this group

This group does not cover:

Supporting structures for PV modules	H02S 20/00

Informative references

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

Circuit arrangements for solar cells	H01L31/02021

Synonyms and Keywords

In patent documents, the expressions/words “modules” and “panels” are often used as synonyms.

H01L 31/044

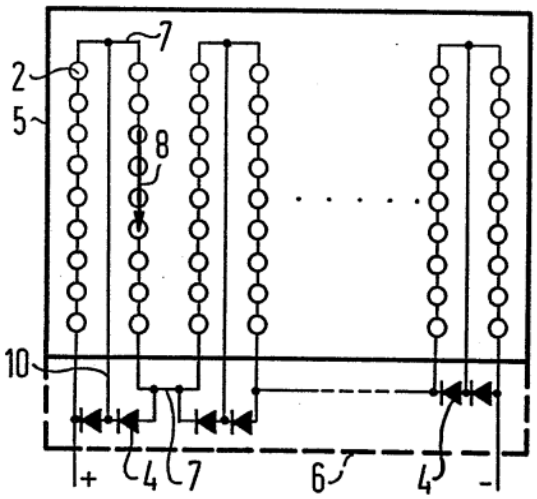
Including bypass diodes (bypass diodes in the junction box H02S 40/34)

Definition statement

This group covers:

Bypass diodes in PV modules, e.g. bypass diodes for a string of PV cells in a PV module

Example:



References relevant to classification in this group

This group does not cover:

bypass diodes in the junction box	H02S 40/34

H01L 31/0443

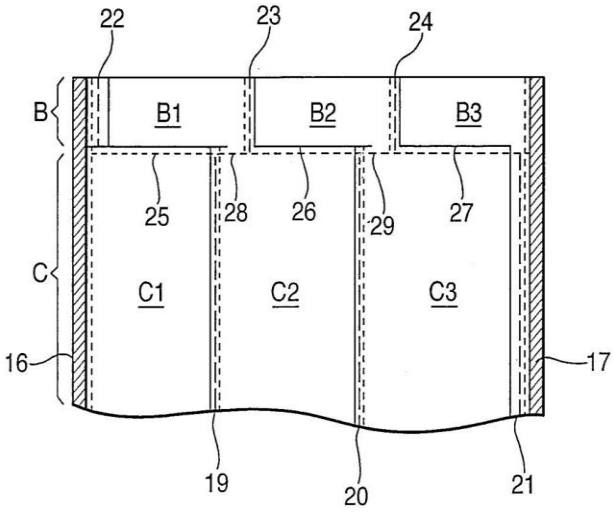
comprising bypass diodes integrated or directly associated with the devices, e.g. bypass diodes integrated or formed in or on the same substrate as the photovoltaic cells

Definition statement

This group covers:

Bypass diodes in PV modules, e.g. integrated with thin film solar cells.

Example:



(B: bypass diodes, C: plurality of thin film solar cells)

H01L 31/0445

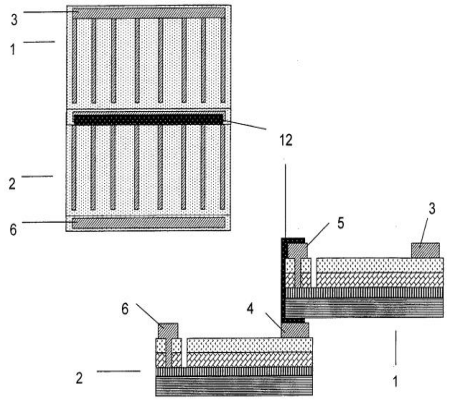
including thin film solar cells, e.g. single thin film a-Si, CIS or CdTe solar cells

Definition statement

This group covers:

PV modules or arrays of single PV cells including inorganic thin film solar cells, e.g. single thin film a-Si, CIS or CdTe solar cells.

Example:



H01L 31/046

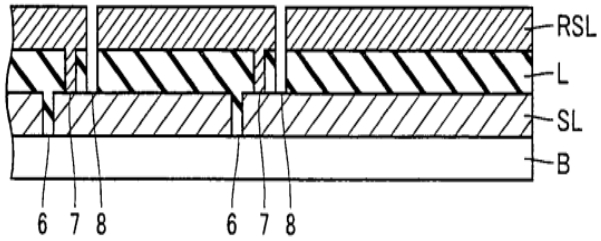
PV modules composed of a plurality of thin film solar cells deposited on the same substrate

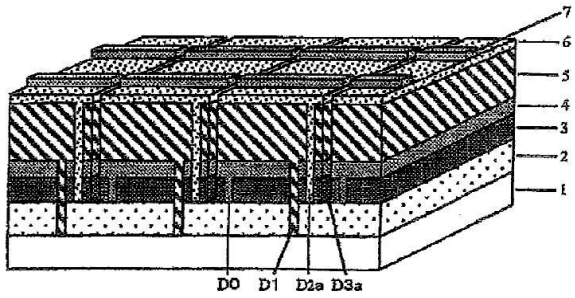
Definition statement

This group covers:

PV modules composed of a plurality of inorganic thin film solar cells deposited on the same substrate and electrically connected together, e.g. thin film a-Si, CIS or CdTe solar cells.

Example:





Informative references

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

Method of deposition of CIS compounds	H01L31/0322
Thin films deposited on metallic or insulating substrates	H01L31/0392
Method of deposition of amorphous silicon cells	H01L31/202, H01L31/204
Roll to roll deposition of amorphous silicon device	H01L31/206

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

Definition statement

This group covers:

specific patterning methods (like laser trimming, chemical etching) which aims at forming a module from a plurality of (interconnected) adjacent thin film solar cells from initially continuous thin films.

Informative references

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

Processes or apparatus specially adapted for the manufacture or treatment of PV cells	H01L31/18
Processes or apparatus specially adapted for the manufacture or treatment of PV cells comprising amorphous semiconductor materials	H01L31/20

H01L 31/0465

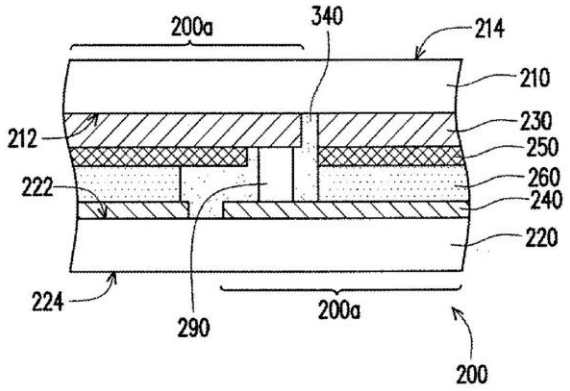
comprising particular structures for the electrical interconnection of adjacent PV cells in the module

Definition statement

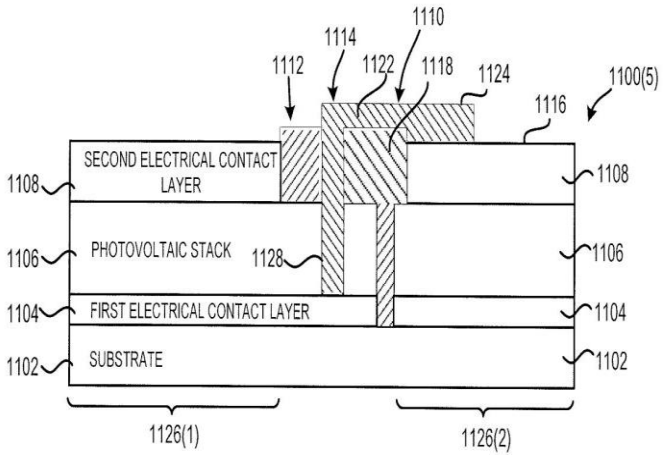
This group covers:

specific interconnection structures interconnecting adjacent thin film solar cells, e.g. insulating spacer to avoid short-circuits between cells.

Examples:



(Reference numeral 290: electrical interconnection structure)



(Reference numeral 1124: electrical interconnection structure)

References relevant to classification in this group

This group does not cover:

specific patterning methods to interconnect adjacent thin film solar cells in a thin film PV module	H01L31/0463

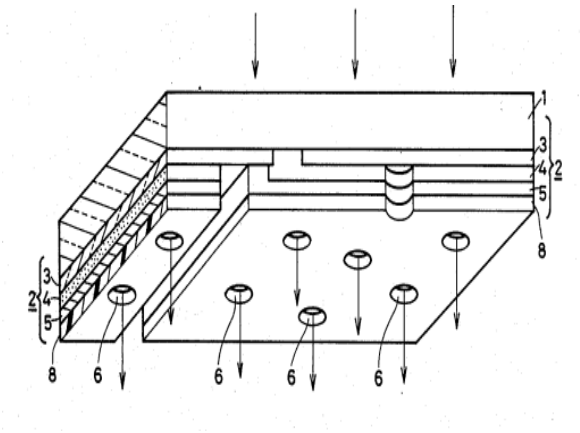
H01L 31/0468

comprising specific means for obtaining partial light transmission through the module, e.g. partially transparent thin film solar modules for windows

Definition statement

This group covers:

Example:



H01L 31/047

PV cell arrays including PV cells having multiple vertical junctions or multiple V-groove junctions formed in a semiconductor substrate

Definition statement

This group covers:

Solar cells formed in a semiconductor substrate (bulk type) and being separated by V-grooves or having a plurality of vertical junctions.

Examples:

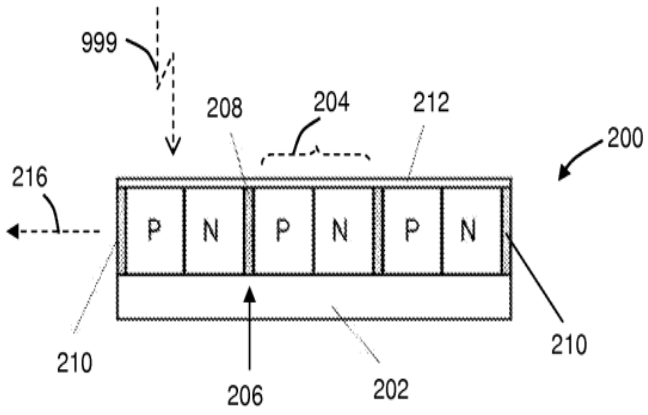


FIG. 3

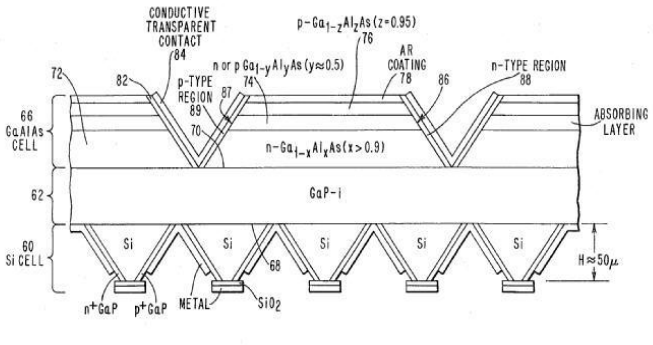
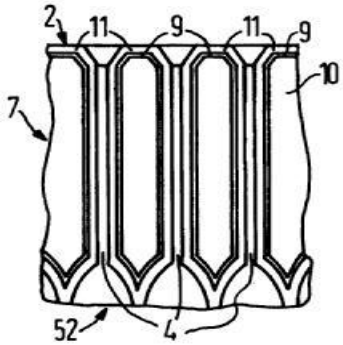
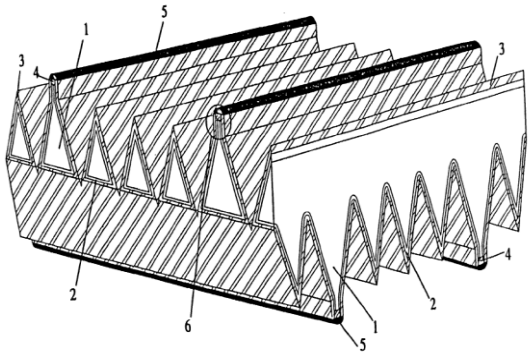

CONDUCTIVE TRANSPARENT CONTACT
84
p-Ga1-zAlzAs (z=0.95)
76
AR COATING
78
n-TYPE REGION
88
n or p Ga1-yAlyAs (y≈0.5)
74
p-TYPE REGION
87
89
82
72
86
66
GaAlAs CELL
70
ABSORBING LAYER
n-Ga1-xAlxAs (x>0.9)
62
GaP-i
60
Si CELL
Si
68
H≈50μ
n+GaP
p+GaP
METAL
SiO2

FIG 7


2
11
9
11
9
10
7
52
4


5
1
3
4
3
4
2
6
2
1
5

H01L 31/0475

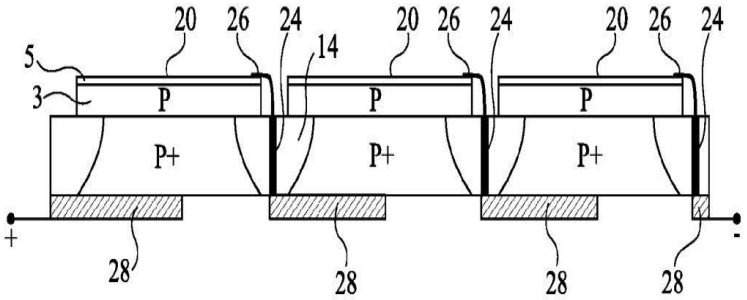
PV cell arrays made by cells in a planar, e.g. repetitive, configuration on a single semiconductor substrate; PV cell microarrays (PV modules composed of a plurality of thin film solar cells deposited on the same substrate H01L 31/046)

Definition statement

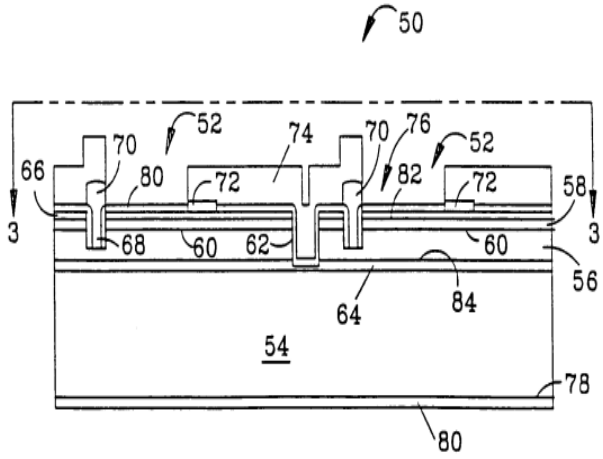
This group covers:

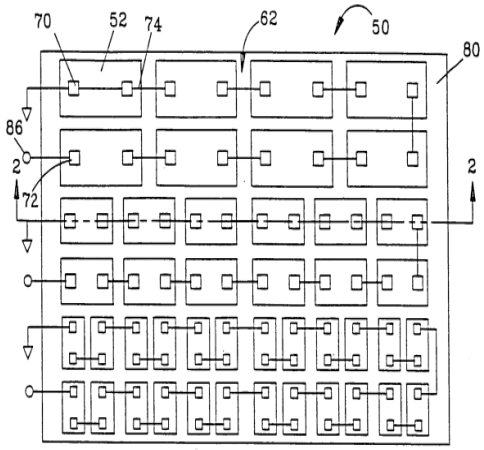
Photovoltaic cell arrays made by cells in a planar, e.g. repetitive, configuration on a single semiconductor substrate; PV cell microarrays.

Examples:



(Reference numerals 5: N-doping, 3: P-doping)





References relevant to classification in this group

This group does not cover:

Photovoltaic modules composed of a plurality of thin film solar cells deposited on the same substrate	H01L 31/046

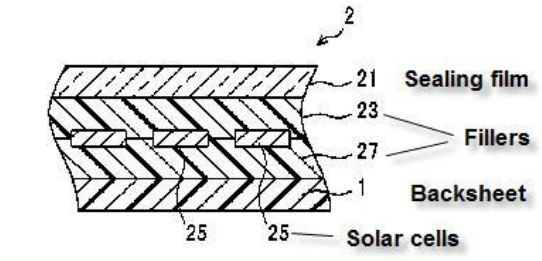
H01L 31/048

Encapsulation of modules

Definition statement

This group covers:

1. PV devices comprising encapsulation layers specially adapted for protecting the photovoltaic module, e.g. details of laminations, materials in-between; methods for obtaining them:



2. Housings for PV cells:

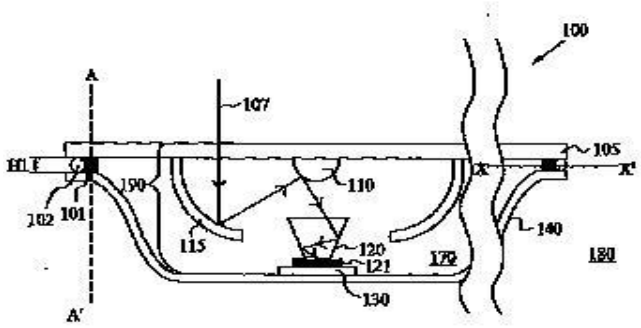


Fig. 1

Informative references

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

Encapsulation of photodetectors or photodiodes	H01L 31/0203
Coatings at the cell level, e.g. for passivation or antireflection	H01L31/02167
Back side reflectors for PV cells	H01L 31/056
Processes or apparatus peculiar to the manufacture or treatment of these devices or of parts thereof	H01L 31/18
Encapsulation of organic solar cells	H01L51/448
Layered products essentially comprising sheet glass, or glass	B32B 17/00
Synthetic resin laminates	B32B 27/00
Adhesives per se	C09J
Materials for sealing or packing joints or covers	C09K 3/10

H01L 31/049

Protective back sheets

Informative references

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

Layered sheets per se	B32B

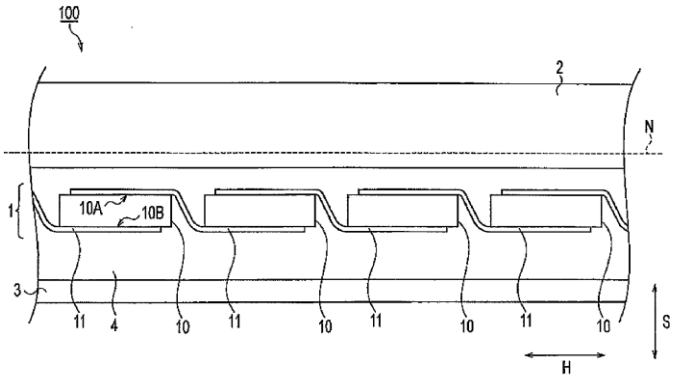
H01L 31/05

Electrical interconnection means between PV cells inside the PV module, e.g. series connection of PV cells (electrodes H01L 31/0224; electrical interconnection of thin film solar cells formed on a common substrate H01L 31/046; particular structures for electrical interconnecting of adjacent thin film solar cells in the module H01L 31/0465; electrical interconnection means specially adapted for electrically connecting two or more PV modules H02S 40/36)

Definition statement

This group covers:

- The serial interconnection of PV cells (10) inside a PV module (100), e.g.:



- Specific interconnection materials for electrically interconnecting PV cells
- Wiring substrates for serial connection of back contacted solar cells
- Methods for interconnecting PV cells

References relevant to classification in this group

This group does not cover:

Electrodes for PV cells	H01L 31/022425
Electrical interconnection of thin film solar cells formed on a common substrate	H01L 31/046
Particular structures for electrical interconnecting of adjacent thin film solar cells in the module	H01L 31/0465
Electrical interconnection means specially adapted for electrically connecting two or more PV modules	H02S 40/36

Informative references

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

Soldering in general	B23K
Conductive pastes as such	H01B1/20
Materials used as interconnection in printed circuits	H05K1/09

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)

Definition statement

This group covers:

- PV cells comprising active cooling means, e.g. peltier elements, a liquid or gaseous coolant, directly associated or integrated with the cell
- PV cells comprising passive cooling means, e.g. heat sinks, directly associated or integrated with the cell

References relevant to classification in this group

This group does not cover:

Cooling means in combination with the PV module	H02S 40/42

Informative references

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

Cooling means using Peltier elements for semiconductor devices in general	H01L 23/38
Cooling means for photodetectors or photodiodes	H01L 31/024
Optical elements directly associated or integrated with the PV cell, e.g. light reflecting and light concentrating means	H01L 31/054
Thermoelectric devices operating with Peltier or Seebeck-effect only	H01L 35/28

H01L 31/0525

including means to utilise heat energy directly associated with the PV cell, e.g. integrated Seebeck elements

Definition statement

This group covers:

Hybrid solar devices, i.e. PV cells including means for utilising thermal energy, e.g. by using Seebeck elements

Informative references

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

Using solar heat per se	F24J 2/00
Means to utilise heat energy directly associated with the PV module	H02S 40/44

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)

Definition statement

This group covers:

Photovoltaic devices including a battery to store electrical energy

References relevant to classification in this group

This group does not cover:

Energy storage means associated with the PV module	H02S 40/38

Informative references

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

Accumulators structurally combined with charging apparatus	H01M 10/465
Circuit arrangements for charging batteries with solar cells	H02J7/35

H01L 31/054

Optical elements directly associated or integrated with the PV cell, e.g. light-reflecting means or light-concentrating means

Definition statement

This group covers:

PV cells comprising solar concentrators, lenses and reflectors, e.g. Fresnel lenses:

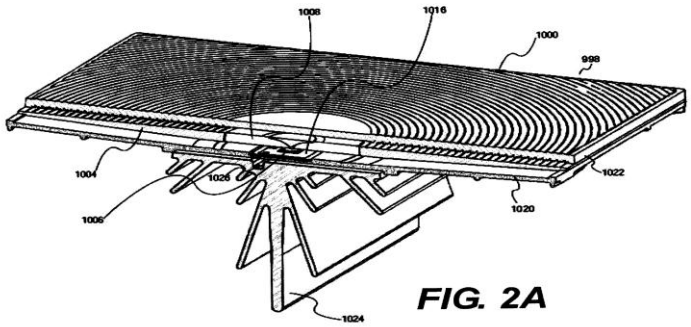


FIG. 2A

Informative references

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

Antireflective coatings for light sensitive devices	H01L 31/0216
Concentrating means for semiconductor photodetectors	H01L 31/0232
Concentrators for solar heat collectors	F24J 2/06
Optical elements per se	G02B

H01L 31/055

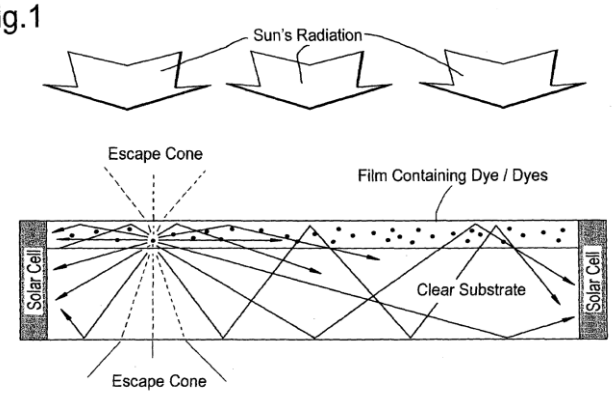
where light is absorbed and re-emitted at a different wavelength by the optical element directly associated or integrated with the PV cell, e.g. by using luminescent material, fluorescent concentrators or up-conversion arrangements

Definition statement

This group covers:

PV cells comprising coatings or separate members, which change the wavelengths of the incident light, making it more suitable for absorption by the associated PV cell, e.g. fluorescent concentrators:

Fig.1



Informative references

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

Luminescent members for semiconductor photodetectors, e.g. for X-ray detectors	H01L 31/02322
Luminescent, e.g. electroluminescent, chemiluminescent materials	C09K 11/00

Glossary of terms

In this group, the following terms (or expressions) are used with the meaning indicated:

Up conversion / down conversion	Incident photons are converted into photons of higher/respectively lower energies (shorter, respectively longer wavelengths).

Synonyms and Keywords

In patent documents the following expressions/words “photoluminescent materials”, “luminescent materials” and “phosphorescent materials” are often used as synonyms.

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H01L 31/056

the light-reflecting means being of the back surface reflector [BSR] type

Definition statement

This group covers:

PV cells comprising light-reflecting means sending back the light that already went through the PV cell, e.g. an Ag electrode in order to reflect the light on the back of the PV cell.

Informative references

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

Electrodes for PV cells	H01L 31/022425

Special rules of classification within this group

When an electrode has a specific structure/composition specially adapted for acting as back surface reflector, the document should be classified in H01L31/056 and additionally in H01L31/022425.

H01L 31/06

characterised by at least one potential-jump barrier or surface barrier

Informative References

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

Photovoltaic cell arrays including PV cells having multiple vertical junctions or multiple V-groove junctions formed in a semiconductor substrate	H01L 31/047

H01L 31/18

Processes or apparatus peculiar to the manufacture or treatment of these devices or of parts thereof (not peculiar thereto H01L 21/00)

Informative references

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

Testing of photovoltaic devices, e.g. of PV modules or single PV cells	H02S 50/10

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H01L 35/00

Thermo-electric devices comprising a junction of dissimilar materials, i.e. exhibiting Seebeck or Peltier effect with or without other thermo-electric effects or thermomagnetic effects; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof; Details thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00; refrigerating machines using electric or magnetic effects F25B 21/00; thermometers using thermoelectric or thermomagnetic elements G01K 7/00; obtaining energy from radioactive sources G21H)

References relevant to classification in this group

This group does not cover:

Thermophotovoltaic systems	H02S 10/30

H02S

Generation of electric power by conversion of infra-red radiation, visible light or ultraviolet light, e.g. using photovoltaic [PV] modules (solar heat collectors F24J 2/00; obtaining electrical energy from radioactive sources G21H 1/12; light sensitive inorganic semiconductor devices H01L 31/00; thermoelectric devices H01L 35/00; pyroelectric devices H01L 37/00; light sensitive organic semiconductor devices H01L 51/42)

Definition statement

This subclass covers:

1. Photovoltaic [PV] power plants, e.g. mobile PV generator systems
2. Combination of PV power plants with other systems for generation of electric energy
3. Supporting structures for PV modules
4. Structural details of PV modules not involving light conversion
5. Components or accessories specially adapted for PV modules, e.g. cleaning arrangements, optical components, electrical components, thermal components
6. Monitoring or testing of PV systems, e.g. load balancing or fault identification
7. Testing of PV devices

References relevant to classification in this group

This group does not cover:

Light sensitive inorganic semiconductor devices	H01L 31/00
Thermoelectric devices	H01L 35/00
Pyroelectric devices	H01L 37/00
Light sensitive organic semiconductor devices	H01L 51/42
Arrangements for obtaining electrical energy from radioactive sources	G21H 1/12
Solar heat collectors	F24J 2/00

Informative references

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

Space applications, e.g. power supply for satellites made of solar cell modules	B64G 1/00
Systems for regulating electric power to the maximum power available from a generator, e.g. from PV cells	G05F 1/67
Circuit arrangements or systems for supplying or distributing electric power	H02J

H02S 10/00

PV power plants; Combinations of PV energy systems with other systems for the generation of electric power

Definition statement

This group covers:

1. PV power plants
2. Hybrid diesel-PV energy systems
3. Hybrid wind-PV energy systems
4. Hybrid hydroelectric-PV energy systems
5. PV power plants comprising energy storage means integrated therein or associated therewith
6. Thermophotovoltaic systems
7. Mobile PV generators

H02S 10/10

including a supplementary source of electric power, e.g. hybrid diesel-PV energy systems (combinations with gas-turbine plants F02C 6/00)

Definition statement

This group covers:

PV power plants combined with a supplementary source of electric energy, e.g. combined with a diesel generator or a hydroelectric power plant

References relevant to classification in this group

This group does not cover:

PV energy systems combined with gas-turbine plants	F02C 6/00

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H02S 10/12

Hybrid wind-PV energy systems

Definition statement

This group covers:

- Electric power generators, where wind turbines are combined with PV modules, e.g.:

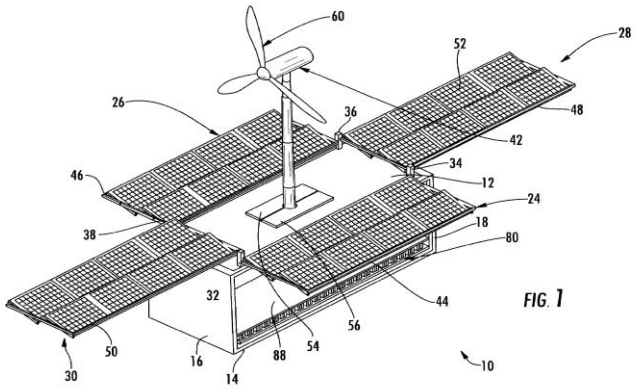


FIG. 1

Informative references

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

Wind Motors per se	F03D

H02S 10/20

Systems characterised by their energy storage means (H02S 40/38 takes precedence)

Definition statement

This group covers:

PV power plants including rechargeable batteries for energy storage.

References relevant to classification in this group

This group does not cover:

Energy storage means, e.g. batteries, structurally associated with PV modules, e.g. directly mounted onto the module	H02S 40/38

Informative references

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

Energy storage means directly associated or integrated with the PV cell	H01L 31/053
Secondary accumulators structurally combined with charging apparatus, e.g. solar battery charging system	H01M 10/46
Circuit arrangements for charging batteries with solar cells	H02J 7/35

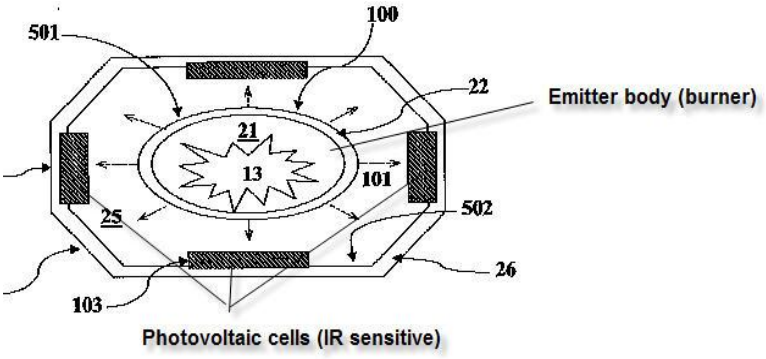
H02S 10/30

Thermophotovoltaic systems (photovoltaic cells specially adapted for conversion or sensing of infra-red [IR] radiation H01L 31/00; thermoelectric devices H01L 35/00)

Definition statement

This group covers:

Systems formed by an infrared radiation emitting source and by a (an array of) low band-gap solar cell(s) which are specifically sensitive to the infrared spectrum emitted by the source. Generally two types of system are the most common one: one in which a special emitter (of refractory materials) is heated (e.g. by a gas flame) and emits a specially adapted infrared spectrum, the other in which the solar light is concentrated in a cavity and converted by the solar cells situated in the cavity.
This subgroup is used to classify documents covering aspects of the systems, including the specific radiators.



Relationship between large subject matter areas

Documents featuring photovoltaic cells optimized for IR radiation spectrum are classified and found in the solar cell groups covering the cell structure or the cell materials (H01L 31/06 and subgroups).

Cells for TPV described independently from the TPV system are classified in the groups according to materials, structure, etc (H01L 31/068) since they merely refer to solar cells specifically sensitive to IR (IR forming also a part of the solar spectrum)

References relevant to classification in this group

This group does not cover:

Photovoltaic cells specially adapted for conversion or sensing of infra-red [IR] radiation	H01L 31/00
Thermoelectric devices	H01L 35/00

Informative references

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

Burners	F23D

Synonyms and Keywords

In patent documents the following abbreviations are often used:

TPV	Thermophotovoltaic

H02S 10/40

Mobile PV generator systems

Definition statement

This group covers:

PV generator systems being movable or displaceable

Example:

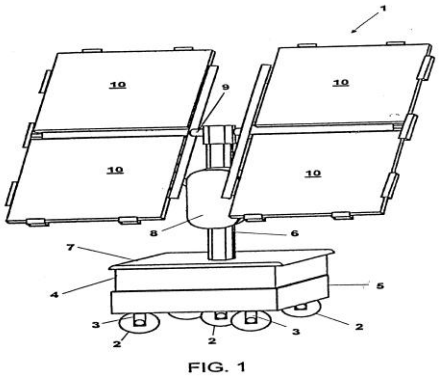


FIG. 1

Informative references

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

Collapsible or foldable PV modules	H02S 30/20

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PROJECT RP0070

H02S 20/00

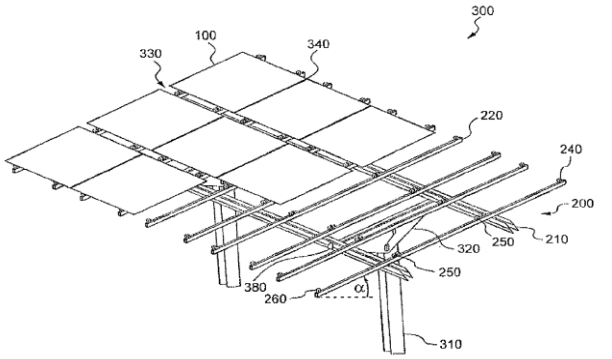
Supporting structures for PV modules

Definition statement

This group covers:

Mechanical structures for supporting one or a plurality of PV modules.

Example:



Informative references

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

Other supports for positioning apparatus or articles per se	F16M 13/00

Special rules of classification within this group

Supporting structures also intended for use with solar heat collectors should also be classified in groups F24J 2/38 or F24J 2/52

H02S 20/10

Supporting structures directly fixed to the ground (H02S 20/30 takes precedence)

References relevant to classification in this group

This group does not cover:

Supporting structures being movable or adjustable, e.g. for angle adjustment	H02S 20/30

H02S 20/20

Supporting structures directly fixed to an immovable object (H02S 20/30 takes precedence)

References relevant to classification in this group

This group does not cover:

Supporting structures being movable or adjustable, e.g. for angle adjustment	H02S 20/30

Informative references

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

Mobile PV generators	H02S 10/40

H02S 20/21

specially adapted for motorways, e.g. integrated with sound barriers

Definition statement

This group covers:

PV modules specially adapted for being used and mounted on sound barriers for road or railways, e.g. using the available surfaces of said barriers to produce electrical power.

Informative references

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

Sound barriers per se	E01F 8/0005

Special rules of classification within this group

Aspects of such PV modules specifically relating to PV applications should be classified in this subgroup, architectural aspects of the barrier walls are covered elsewhere (E01F 8/0005).

H02S 20/22

specially adapted for buildings

Definition statement

This group covers:

Supporting structure specially adapted for integrating PV modules in buildings, e.g. PV modules mounted on the façade:

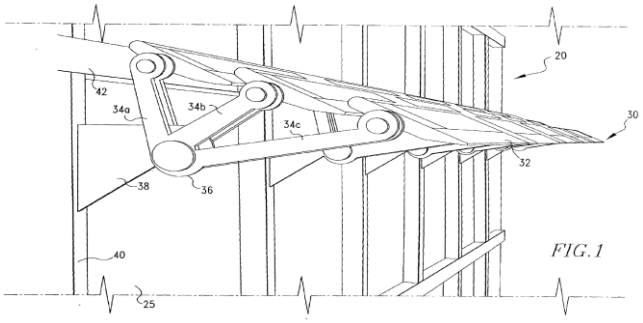


FIG. 1

Informative references

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

Roof tile elements	H02S 20/25
Building materials integrated with PV modules, e.g. façade elements	H02S 20/26

H02S 20/23

specially adapted for roof structures

Definition statement

This group covers:

- Solar PV modules adapted for house roofs, disposed within roof tiles
- Special structural arrangements for installations on house roofs
- Wind protection devices (deflectors) associated with the PV supporting structures
- Ballast devices

H02S 20/25

Roof tile elements

Definition statement

This group covers:

Photovoltaic devices integrated to or associated with one roof tile.
Example:

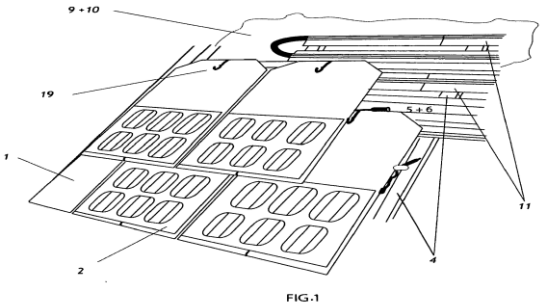


FIG.1

Informative references

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

Roof covering by making use of tiles	E04D 1/00
Roof covering by making use of flat or curved slabs	E04D 3/00
Solar heat collectors having working fluid conveyed through collector, e.g. solar thermal tiles	F24J 2/04

H02S 20/26

Building materials integrated with PV modules, e.g. façade elements (H02S 20/25 takes precedence)

References relevant to classification in this group

This group does not cover:

Roof tile elements	H02S 20/25

H02S 20/32

specially adapted for solar tracking

Definition statement

This group covers:

Example:

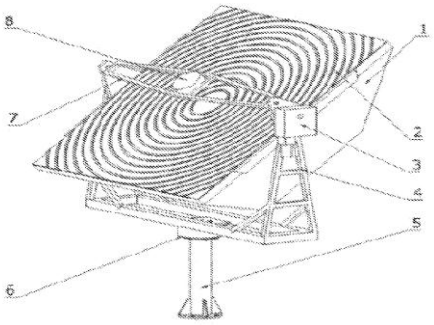


Figure 1

Informative references

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

Solar tracking for solar heat collectors	F24J 2/54
Direction- finders for determining the direction from which electromagnetic waves are being received	G01S 3/78
Control of position or direction	G05D 3/00

H02S 30/00

Structural details of PV modules other than those related to light conversion (semiconductor device aspects of modules of electrolytic light sensitive devices H01G 9/20, of inorganic PV modules H01L 31/00, of organic PV modules H01L 51/42)

Definition statement

This group covers:

1. Frame structure of PV modules
2. Collapsible or foldable PV modules

References relevant to classification in this group

This group does not cover:

Device aspects of modules of electrolytic light sensitive devices	H01G 9/20
Semiconductor device aspects of inorganic PV modules	H01L 31/00
Semiconductor device aspects of organic PV modules	H01L 51/42

H02S 30/10

Frame structures

Definition statement

This group covers:

Frames or parts of frames specially adapted for PV modules

Informative references

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

Supporting structures for PV modules	H02S 20/00
Collapsible or foldable PV modules	H02S 30/20
Solar thermal collectors, including mechanical mounting aspects of solar modules, when also suitable for solar thermal collectors	F24J 2/52
Direction-findings for determining the direction from which light is being received, e.g. forming part of solar tracking systems	G01S 3/78

H02S 30/20

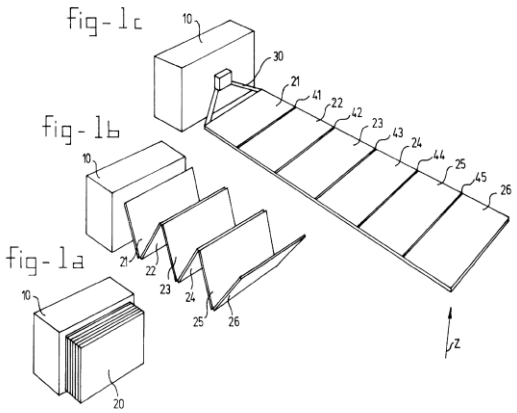
Collapsible or foldable PV modules

Definition statement

This group covers:

- PV modules specially adapted for being collapsible or foldable, e.g. for jalousies, umbrellas, handbags.

Example:



Informative references

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

Mechanical arrangements of foldable PV modules in satellites	B64G 1/44

Special rules of classification within this group

If the collapsible/foldable property is due to a special frame, then the subject matter is additionally classified in H02S 30/10.

H02S 40/00

Components or accessories in combination with PV modules, not provided for in groups H02S 10/00-H02S 30/00

Definition statement

This group covers:

- Cleaning arrangements in combination with PV modules, e.g. means for removing snow
- Optical components in combination with PV modules, e.g. light-concentrating means
- Electrical components in combination with PV modules, e.g. junction boxes, module-to-module interconnection
- Thermal components in combination with PV modules, e.g. cooling means

H02S 40/10

Cleaning arrangements

Informative references

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

Cleaning windows	A47L 1/00
Cleaning in general	B08B

H02S 40/12

Means for removing snow

Informative references

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

Snow traps for roof coverings	E04D 13/10

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H02S40/20

Optical components

Informative references

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

Optical elements in general	G02B

H02S 40/22

Light-reflecting or light-concentrating means (directly associated with the PV cell or integrated with the PV cell H01L 31/054)

Definition statement

This group covers:

Example:

Photovoltaic assembly with concentration (1) and spectral splitting (6, 7) of collected light beam:

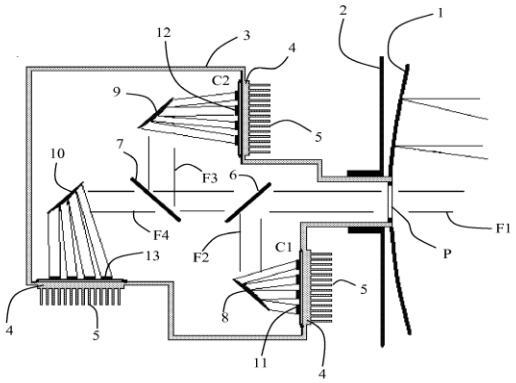


FIG. 1

References relevant to classification in this group

This group does not cover:

Light-reflecting or light-concentrating means directly associated with the PV cell or integrated with the PV cell	H01L 31/054

Informative references

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

Solar heat collectors having concentrating elements	F24J 2/06

H02S40/30

Electrical components

Informative references

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

Electric line connectors; Electric current collectors	H01R

H02S 40/32

comprising DC/AC inverter means associated with the PV module itself, e.g. AC modules

Definition statement

This group covers:

- DC/AC inverter means directly associated with the PV module, e.g. inverter on the backside of the PV module.

Informative references

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

Regulating electric power from a generator, e.g. from a solar module	G05F 1/67
Inverters per se	H02M
Circuit arrangements or systems for supplying or distributing electric power, e.g. circuits for connecting the PV module to the inverter	H02J

H02S 40/34

comprising specially adapted electrical connection means to be structurally associated with the PV module, e.g. junction boxes

Definition statement

This group covers:

- Junction boxes associated with the PV module, e.g. one box per module for electrical connection, or comprising bypass diodes

Informative references

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

Distribution boxes; Connection or junction boxes	H02G 3/08
Terminal blocks	H01R 9/24

H02S 40/36

characterised by special electrical interconnection means between two or more PV modules, e.g. electrical module-to-module connection

Definition statement

This group covers:

Electrical interconnection between two or more PV modules.

Example:

- Electrical contacts 34 and 36 are used for interconnecting two PV modules:

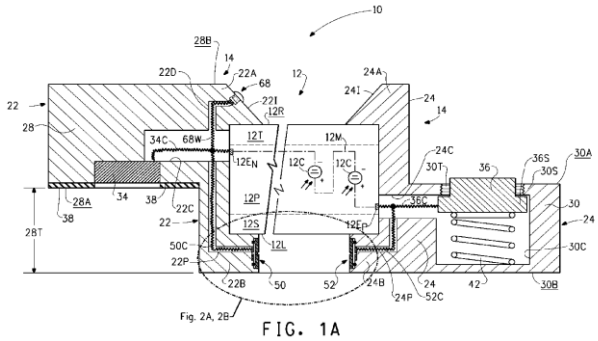


FIG. 1A

Informative references

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

Electrodes of PV cells	H01L 31/022425
Particular structures for electrical interconnecting of adjacent thin film solar cells in the module	H01L 31/0465
Interconnection between solar cells inside a PV module	H01L 31/05
Conductive pastes as such	H01B 1/20

Glossary of terms

In this group, the following terms (or expressions) are used with the meaning indicated:

"Interconnection" in this case means electrical connection, not mechanical.

H02S 40/40

Thermal components (H02S 10/30 takes precedence)

References relevant to classification in this group

This group does not cover:

Thermophotovoltaic systems	H02S 10/30

H02S 40/42

Cooling means (cooling means directly associated or integrated with the PV cell H01L 31/052)

References relevant to classification in this group

This group does not cover:

Cooling means directly associated or integrated with the PV cell	H01L 31/052

H02S 40/44

Means to utilise heat energy, e.g. hybrid systems producing warm water and electricity at the same time (directly associated with the PV cell or integrated with the PV cell H01L 31/0525)

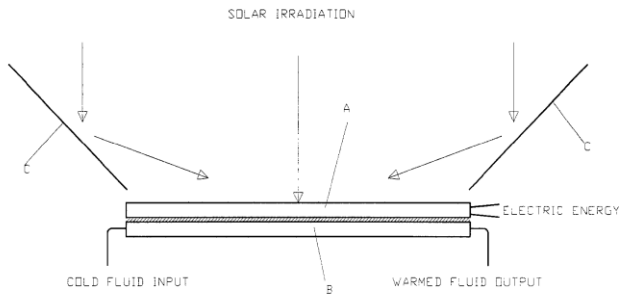
Definition statement

This group covers:

- Hybrid PV modules, producing warm water and electricity at the same time

Example:

STRUCTURE OF THE PANEL



References relevant to classification in this group

This group does not cover:

Means to utilise heat energy directly associated with the PV cell or integrated with the PV cell	H01L 31/0525

Informative references

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

Using solar heat per se	F24J 2/00

H02S 50/00

Monitoring or testing of PV systems, e.g. load balancing or fault identification

Informative references

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

Burglar, theft or intruder alarms	G08B 13/00
Testing of electric apparatus, lines, or components for short-circuits, discontinuities, leakage, or incorrect line connection	G01R 31/02

H02S 50/10

Testing of PV devices, e.g. of PV modules or single PV cells (testing of semiconductor devices during manufacturing H01L 22/00)

Definition statement

This group covers:

- Testing of electrical properties of PV devices in the dark state, e.g. short circuit test
- Testing of electrical properties, e.g. I-V characteristics, of PV devices under solar simulators

References relevant to classification in this group

This group does not cover:

Testing of semiconductor devices during manufacturing	H01L 22/00

Informative references

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

Testing of general semiconductor devices	G01R 31/26
Testing of electrical properties of electrical power supplies	G01R 31/40
Lighting devices intended for fixed installation, e.g. solar simulators	F21S 8/00
Electroluminescent light sources	H05B 33/00

H02S 50/15

using optical means, e.g. using electroluminescence

Definition statement

This group covers:

- Testing of optical responses e.g. electroluminescence, light reflection or light absorption, of PV devices

Informative references

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

Investigating or analysing materials by fluorescence or phosphorescence	G01N 21/64
Investigating or analysing materials by electroluminescence	G01N 21/66

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2. B. DEFINITIONS QUICK FIX

Symbol	**Location of change** (e.g., section title)	**Existing**	**New**
G02B	Informative References	H01L31/052	H01L31/054

NOTE: The table above may be used for less detailed definition corrections or modifications, e.g. misspelling, minor clarification, deletion of reference. Changes may not affect the subject matter scope of the area.

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3. REVISION CONCORDANCE LIST (RCL)

Type*	**From CPC Symbol (existing)**	**To CPC Symbol (new)**
C	F24J 2/00	F24J 2/00 H02S 20/00 H02S 40/44
C	F24J 2/38	F24J 2/38 H02S 20/32
C	G01R 31/26	G01R 31/26 H01L22/00
D	G01R 31/2605	H02S 50/10
C	G01R 31/40	G01R 31/40 H02S 50/10
D	G01R 31/405	H02S 50/10
D	H01L 25/045	< administrative transfer to H01L31/043 >
C	H01L 27/142	H01L 27/142 H01L 31/0443 H01L 31/0445 – H01L 31/0475
D	H01L 27/1422	< administrative transfer to H01L31/0475 >
D	H01L 27/1423	< administrative transfer to H01L31/046 >
D	H01L 27/1425	< administrative transfer to H01L31/0463 >
D	H01L 27/1426	< administrative transfer to H01L31/0465 >
D	H01L 27/1427	< administrative transfer to H01L31/0468 >
D	H01L 27/1428	< administrative transfer to H01L31/047 >
C	H01L 31/02021	H01L 31/02021, H02S 40/34
C	H01L 31/0203	H01L 31/0203 H01L 31/048 H01L 51/44
C	H01L 31/0216	H01L 31/0216 H01L 31/041
C	H01L 31/0232	H01L 31/0232 H01L31/0236 H01L 31/054 H02S 40/20
C	H01L 31/024	H01L 31/024 H01L 31/052
C	H01L 31/04	H01L 31/04 H01L 31/042 H02S 50/10
D	H01L 31/0406	< administrative transfer to H02S10/30 >
D	H01L 31/0413	< administrative transfer to H01L31/041 >
C	H01L 31/042	H01L 31/042 H01L 31/ 043 H01L 31/047 H01L 31/0475 H01L 31/053 H02S 20/00 - H02S 20/32

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Type*	**From CPC Symbol (existing)**	**To CPC Symbol (new)**
		H02S 40/38
D	H01L 31/0422	< administrative transfer to H02S20/00; thereafter reclassification to H02S 20/00 - 20/32 and H02S 30/10 >
D	H01L 31/0424	< administrative transfer to H02S 30/10 >
D	H01L 31/0426	< administrative transfer to H02S 20/21 >
D	H01L 31/0428	< administrative transfer to H02S 40/32 >
D	H01L 31/045	< administrative transfer to H02S 30/20 >
C	H01L 31/048	H01L 31/048 H01L 31/049 H02S 20/00 - H02S 20/32
D	H01L 31/0482	< administrative transfer to H02S 20/23 >
D	H01L 31/0483	< administrative transfer to H02S 20/25 >
D	H01L 31/0484	< administrative transfer to H02S 20/24 >
D	H01L 31/0485	< administrative transfer to H02S 40/34 >
D	H01L 31/0486	< administrative transfer to H02S 40/345 >
D	H01L 31/0487	< administrative transfer to H01L 31/049 >
C	H01L 31/05	H01L 31/05 H01L31/044 H01L 31/0443 H02S 40/36
C	H01L 31/052	H01L 31/052 H01L 31/0525 H01L 31/054 H01L 31/056 H02S 40/20 H02S 40/22 H02S 40/42
C	H01L31/0521	H01L31//0521 H02S 40/425
D	H01L 31/0522	< administrative transfer to H01L31/054; thereafter reclassification to H01L 31/054 and H02S 40/20 >
D	H01L 31/0524	< administrative transfer to H01L31/0543; thereafter reclassification to H01L 31/0545 and H02S 40/20 >
C	H01L31/0525	< administrative transfer of the existing inventory to H01L31/0547; thereafter renaming of the group to a new title >
D	H01L31/0527	< administrative transfer to H01L 31/056 >
D	H01L31/0528	< administrative transfer to H01L 31/0549 >
C	H01L 31/055	H01L 31/055, H02S 40/22
D	H01L 31/058	< administrative transfer to H02S40/44; thereafter reclassification to H01L31/0525 and H02S40/44 >
D	H01L 31/0583	< administrative transfer to H02S10/10; thereafter reclassification to H02S 10/10 and H02S 10/12 >

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Type*	**From CPC Symbol (existing)**	**To CPC Symbol (new)**
D	H01L 31/0586	< administrative transfer to H02S40/38; thereafter reclassification to H01L 31/053 and H02S 40/38 >
D	H02N 6/00	< administrative transfer to H02S 99/00 >
C	H02S 10/00	H02S 10/00 – 10/40
C	H02S 20/00	H02S 20/00 – 20/32
C	H02S 30/00	H02S 30/00 – 30/20
C	H02S 40/00	H02S 40/00 – 40/44
C	H02S 50/00	H02S 50/00 – 50/15

***** C = entries with modified file scope (reclassification involved); D = deleted entries,

NOTE: Frozen (F) symbols are not included in the RCL table above.

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4. CHANGES TO THE CPC-TO-IPC CONCORDANCE

CPC	**IPC**	**Action***
G01R 31/2605		delete CPC/IPC
G01R 31/405		delete CPC/IPC
H01L 25/045		delete CPC/IPC
H01L 27/1422		delete CPC/IPC
H01L 27/1423		delete CPC/IPC
H01L 27/1425		delete CPC/IPC
H01L 27/1426		delete CPC/IPC
H01L 27/1427		delete CPC/IPC
H01L 27/1428		delete CPC/IPC
H01L 31/0406		delete CPC/IPC
H01L 31/041	H01L 31/041	new CPC/IPC
H01L 31/0413		delete CPC/IPC
H01L 31/0422		delete CPC/IPC
H01L 31/0424		delete CPC/IPC
H01L 31/0426		delete CPC/IPC
H01L 31/0428		delete CPC/IPC
H01L 31/043	H01L 31/043	new CPC/IPC
H01L 31/044	H01L 31/044	new CPC/IPC
H01L 31/0443	H01L 31/0443	new CPC/IPC
H01L 31/0445	H01L 31/0445	new CPC/IPC
H01L 31/045		delete CPC/IPC
H01L 31/046	H01L 31/046	new CPC/IPC
H01L 31/0463	H01L 31/0463	new CPC/IPC
H01L 31/0465	H01L 31/0465	new CPC/IPC
H01L 31/0468	H01L 31/0468	new CPC/IPC
H01L 31/047	H01L 31/047	new CPC/IPC
H01L 31/0475	H01L 31/0475	new CPC/IPC
H01L 31/0482		delete CPC/IPC
H01L 31/0483		delete CPC/IPC
H01L 31/0484		delete CPC/IPC
H01L 31/0485		delete CPC/IPC
H01L 31/0486		delete CPC/IPC
H01L 31/0487		delete CPC/IPC
H01L 31/049	H01L 31/049	new CPC/IPC
H01L 31/0522		delete CPC/IPC
H01L 31/0524		delete CPC/IPC
H01L 31/0527		delete CPC/IPC
H01L 31/0528		delete CPC/IPC
H01L 31/053	H01L 31/053	new CPC/IPC
H01L 31/054	H01L 31/054	new CPC/IPC

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CPC	**IPC**	**Action***
H01L 31/0543	H01L 31/054	new CPC/IPC
H01L 31/0547	H01L 31/054	new CPC/IPC
H01L 31/0549	H01L 31/054	new CPC/IPC
H01L 31/056	H01L 31/056	new CPC/IPC
H01L 31/058		delete CPC/IPC
H01L 31/0583		delete CPC/IPC
H01L 31/0586		delete CPC/IPC
H02N 6/00		delete CPC/IPC
H02S 10/10	H02S 10/10	new CPC/IPC
H02S 10/12	H02S 10/12	new CPC/IPC
H02S 10/20	H02S 10/20	new CPC/IPC
H02S 10/30	H02S 10/30	new CPC/IPC
H02S 10/40	H02S 10/40	new CPC/IPC
H02S 20/10	H02S 20/10	new CPC/IPC
H02S 20/20	H02S 20/20	new CPC/IPC
H02S 20/21	H02S 20/21	new CPC/IPC
H02S 20/22	H02S 20/22	new CPC/IPC
H02S 20/23	H02S 20/23	new CPC/IPC
H02S 20/24	H02S 20/24	new CPC/IPC
H02S 20/25	H02S 20/25	new CPC/IPC
H02S 20/26	H02S 20/26	new CPC/IPC
H02S 20/30	H02S 20/30	new CPC/IPC
H02S 30/10	H02S 30/10	new CPC/IPC
H02S 30/20	H02S 30/20	new CPC/IPC
H02S 40/10	H02S 40/10	new CPC/IPC
H02S 40/12	H02S 40/12	new CPC/IPC
H02S 40/20	H02S 40/20	new CPC/IPC
H02S 40/22	H02S 40/22	new CPC/IPC
H02S 40/30	H02S 40/30	new CPC/IPC
H02S 40/32	H02S 40/32	new CPC/IPC
H02S 40/34	H02S 40/34	new CPC/IPC
H02S 40/345	H02S 40/34	new CPC/IPC
H02S 40/36	H02S 40/36	new CPC/IPC
H02S 40/38	H02S 40/38	new CPC/IPC
H02S 40/40	H02S 40/40	new CPC/IPC
H02S 40/42	H02S 40/42	new CPC/IPC
H02S 40/425	H02S 40/42	new CPC/IPC
H02S 40/44	H02S 40/44	new CPC/IPC
H02S 50/10	H02S 50/10	new CPC/IPC
H02S 50/15	H02S 50/15	new CPC/IPC

*Action column:

- For a new (N) CPC symbol, provide an IPC symbol and complete the Action column with “new CPC/IPC.”
- For an existing CPC symbol where the existing IPC symbol needs to be changed, provide an updated IPC symbol and complete the Action column with “new IPC.”

- For a deleted (D) CPC symbol complete the Action column with “delete CPC/IPC.”
- For a 2000 series CPC symbol with no IPC equivalent, complete the Action column with “CPCONLY”.

NOTE: Frozen (F) symbols are <u>not</u> included in the CICL table above.

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5. CROSS-REFERENCE LIST (CRL)

Scheme references impacted by this revision project

Location of reference to be changed	**Referenced subclass or group to be changed**	**Change**
E01F 8/0023	H01L 31/0426	H02S 20/21
G01R 31/42	G01R 31/405	H02S 50/10

Definitions references impacted by this revision project

Location of reference to be changed	**Referenced subclass or group to be changed**	**Section of definition**	**Change**
B63B 35/00	H02N 6/00	Informative References	H02S 99/00
C25B	H01L 31/058	Informative References	H02S 40/44
E01F 8/00	H01L 31/0426	References relevant to…	H02S 20/23
E04D	H01L 31/0482	References relevant to…	H02S 20/25
E04D 1/00	H01L 31/0482	References relevant to…	H02S 20/23
E04D 3/00	H01L 31/0482	References relevant to…	H02S 20/23
E04D 3/40	H01L 31/0482	References relevant to…	H02S 20/23
E04D 13/00	H01L 31/0482, H01L 31/0483	References relevant to…	H02S 20/00
F16M	H01L 31/0422	Informative references	H02S 20/00
G01M 11/00	G01R 31/2605	References relevant to…	H02S 50/10
H01L 25/042	H01L 25/045	Informative references	H01L 31/043
H01L 31/02002	H01L 27/1423	References relevant to…	H01L 31/046
H01L 31/022425	H01L 27/1423	Informative references	H01L 31/046
H01L 31/076	H01L 27/142	Informative references	H01L 31/0475
H01L 31/077	H01L 25/045	Informative references	H01L 31/046

NOTES:

- The CRL tables above are used for changes to locations outside of the project scope. Changes to references in scheme titles or definitions inside the project scope will be reflected in the "scheme change" template or one of the "definition" templates.
- In addition to other changes proposed, D (deleted) and F (frozen) symbols should be indicated as deleted from the scheme and definitions in the tables above.

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- When a reference is deleted, text related to that reference will also be deleted.
- If adding a reference, the text associated with the reference must be included in the “Change” column.