F24J

PRODUCING OR USE OF HEAT NOT OTHERWISE PROVIDED FOR (materials therefor C09K5/00 ; engines or other mechanisms for producing mechanical power from heat, see the relevant classes, e.g. F03G for using natural heat)

Definition statement

This subclass/group covers:

Apparatus or devices using heat produced by exothermal chemical reactions, use of solar heat, e.g. solar collectors and other production or use of heat not derived from combustion, e.g. geothermal heat.

Relationship between large subject matter areas

Domestic stoves or ranges are classified in F24B or F24C.

Domestic- or space heating systems are classified in F24D.

Fluid heaters having heat-generating means are classified in F24H.

References relevant to classification in this subclass

This subclass/group does not cover:

Materials for the production of heat by chemical reaction other than by combustion	C09K 5/00
Engines or other mechanisms for producing mechanical power from heat	F03G

F24J 1/00

Apparatus or devices using heat produced by exothermal chemical reactions other than by combustion (for cooking-vessels A47J36/28; self-heating compresses A61F [N: A61F7/04C]; materials for the production of heat or cold involving non-reversible chemical reactions, other than by combustion, when used C09K5/18)

Definition statement

This subclass/group covers:

Apparatus wherein an exothermal chemical reaction takes place and wherein

the heat produced is further used, e.g. heat packs.

Details of heat generating devices, e.g. mountings, means for initiating the exothermal reaction, e.g. ignition devices, control means.

References relevant to classification in this subclass

This subclass/group does not cover:

Footwear with heating arrangements	A43B 7/02
Warming devices for cooking vessels generating the heat by exothermic reactions, e.g. heat released by the contact of unslaked lime with water	A47J 36/28
Self-heating compresses	A61F 7/03
Warming pads	A61F 7/08
Disinfection, sterilisation or deodorisation of air	A61L 9/03
Chemical processes with heating of the reactor	B01J 8/06
Using heat from a specified chemical reaction in plants characterised by the use of steam or heat accumulators	F01K 3/18
Heat storage apparatus using thermochemical reactions	F28D 20/00
Initiators for triggering crystallisation in latent heat storage apparatus	F28D 20/02
Thermonuclear fusion reactors	G21B 1/00

Informative references

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

Layered products	B32B
Packages having self-contained heating means	B65D 81/34

Explosives or thermic compositions	C06B
Materials undergoing chemical reactions when used	C09K 5/16

F24J 2/00

Use of solar heat, e.g. solar heat collectors (distillation or evaporation of water using solar energy C02F1/14; devices for producing mechanical power from solar energy F03G6/00; semiconductor devices adapted for converting solar energy into electrical energy H01L25/00, H01L31/04; semiconductor devices including arrays of solar cells using heat energy H01L31/058; generators in which light radiation is directly converted into electrical energy H02N6/00)

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.

Relationship between large subject matter areas

Roof covering aspects of solar energy are classified in subgroups of F24J 2/00, not in E04D.

Solar heat systems not otherwise provided for are classified in F24J 2/42, 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 H01L 31/058, not in F24J.

Supports for solar modules of any type (thermal or photovoltaic or both) are classified in F24J 2/52.

References relevant to classification in this subclass

This subclass/group does not cover:

Protection against solar radiation in cosmonautics	B64G 1/54
Distillation or evaporation of water using solar heat	C02F 1/14
Protective devices against sunshine for buildings	E06B 9/24
Gas-turbine plants using solar energy	F02C 1/05
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	F24D 11/02
Domestic hot water supply systems or recuperated waste heat systems or conventional heaters, combined with solar energy	F24D 17/00
Drying by using solar heat	F26B 3/28
Semiconductor devices adapted for converting solar energy into electrical energy	H01L 31/00
Thermophotovoltaic systems	H01L 31/04
Semiconductor devices including arrays of solar cells using heat energy	H01L 31/058
Generators in which light radiation is directly converted into electrical energy	H02N 6/00

Informative references

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

Collecting solar energy for greenhouses	A01G 9/24
Footwear with heating arrangements	A43B 7/02
Disinfection, sterilisation or deodorisation of air	A61L 9/03
Chemical processes with heating of the reactor	B01J 8/06
Chemical reactors using sunlight	B01J 19/12
Packages having self-contained heating means	B65D 81/34
Coating of glass	C03C 17/00

Joining glass to metal	C03C 17/00
Materials undergoing chemical reactions when used	C09K 5/16
Coating metallic materials	C23C
Coating by spraying	C23C 4/00
Coating by vacuum evaporation, by physical vapour deposition	C23C 14/00
Electrolytic coating	C25D
Three-dimensional framework structures	E04D 1/19
Thermal insulation for buildings	E04D 1/74
Vacuum insulating panels	E04B 1/80
Thin building elements with heating or cooling conduits	E04C 2/52
Fasteners for roof coverings	E04D 1/34
Roof coverings	E04D 3/06, E04D 3/08
Roof metal glazing bars	E04D 3/24
Corrugated roofs	E04D 3/30
Roof walkways	E04D 13/12
Systems for heating the water content of swimming pools	E04H 4/12
Towers, masts, poles	E04H 12/00
Windows	E06B
Using heat from a specified chemical reaction in steam plants	F01K 3/18
Devices for producing mechanical	F03G 6/06

power from solar energy with means for concentrating solar rays	
Wind motors combined with solar conversion means	F03D 9/00
Fasteners in general	F16B
Clamps	F16B 2/02, F16B 2/06
Joining plates to one another	F16B 5/00
Connection of rods or tubes mutually	F16B 7/00
Connection of rods or tubes to flat surfaces	F16B 9/00
Valves	F16K
Pipes	F16L
Frames, casings or beds for engines, machines; Stands or supports	F16M
Lighting devices using daylight	F21S 11/00
Reflectors for lighting devices	F21V 7/00
Steam generators using solar energy	F22B 1/00
Air conditioning using solar energy	F24F 5/00
Refrigeration systems using solar energy	F25B 27/00
Heat exchange apparatus	F28D
Details of heat transfer	F28F
Direction finders for determining the direction from which electromagnetic waves are being received	G01S 3/78
Optics	G02B

Reflective coatings	G02B 1/10
Antireflection coatings	G02B 1/11
Simple or compound lenses	G02B 3/00
Mirrors	G02B 5/08
Light guides	G02B 6/00
Mountings for mirrors	G02B 7/182
Mounting adapted for very large mirrors	G02B 7/183
Systems with reflecting surfaces, with or without refracting elements	G02B 17/00
Electro-optical glazing	G02F 1/13
Supports for aerials	H01Q 1/12
Orientation of aerials	H01Q 3/08
Supporting frames for photovoltaic devices	H01L 31/042
Photovoltaic devices specially adapted for house roof structures, e.g. roof tile elements	H01L 31/048
Light concentrating means for photovoltaic devices	H01L 31/052

F24J 3/00

Other production or use of heat, not derived from combustion (use of solar heat F24J2/00)

Definition statement

This subclass/group covers:

Particular heat generators not classified elsewhere, e.g. using heat resulting from internal friction of a moving fluid or from friction between a fluid and a

moving body, e.g. viscous fluid heat generators with internal rotor.

Use of natural heat, e.g. thermal energy recovered from the sea.

Use of geothermal heat, e.g. geothermal probes.

Relationship between large subject matter areas

Devices for producing mechanical power from geothermal energy are classified either in F03G (if details about the mechanical-power-producing-mechanisms) or in F24J 3/08 (if details about the geothermal heat exchanger) or in both.

References relevant to classification in this subclass

This subclass/group does not cover:

Heat recuperation means in installations for fermenting manure	A01C 3/02
Adding or removing heat to or from composting process	C05F 17/00
Fermentation plants with heat exchange means	C12M 1/02
Mechanical power producing mechanisms using pressure differences or thermal differences occuring in nature	F03G 7/04
Ocean thermal energy conversion, i.e. OTEC	F03G 7/05
Pulse tube cycles	F25B 9/14
Fusion reactors	G01B 1/00, G01B 3/00
Use of effects of cosmic radiation	G21H 3/00
Thermoelectric devices	H01L 35/00

Informative references

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

Drilling	E21B

Steam generation by transformation of mechanical energy into heat energy	F22B 3/06
Heat pump characterized by the source of potential heat	F25B 30/06
Use of the ground or aquifers for heat storage	F28D 20/00
Heating by electric, magnetic or electromagnetic fields	H05B 6/00