

**CPC****COOPERATIVE PATENT CLASSIFICATION****F24J****PRODUCING OR USE OF HEAT NOT OTHERWISE PROVIDED**

**FOR** (materials therefor [C09K 5/00](#); engines or other mechanisms for producing mechanical power from heat, see the relevant classes, e.g. [F03G](#) for using natural heat)

**F24J 1/00**

**Apparatus or devices using heat produced by exothermal chemical reactions other than by combustion** (for cooking-vessels [A47J 36/28](#); self-heating compresses [A61F {A61F 7/03}](#); materials for the production of heat or cold involving non-reversible chemical reactions, other than by combustion, when used [C09K 5/18](#))

**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](#))

**NOTE**

Supporting structures also intended for use with photovoltaic modules should further be classified in the relevant groups of subclass [H02S](#).

- F24J 2/0007 . {Passive solar heat collectors}
- F24J 2/0015 . {Solar heat collectors absorbing essentially direct solar radiation combined with a solar heat collector absorbing concentrated radiation}
- F24J 2/0023 . {Solar heat collector using additional ambient air heat or another heat source, e.g. electrical}
- F24J 2002/003 . {Heat traps}
- F24J 2002/0038 . {Solar modules layout; Modular arrangements}
- F24J 2002/0046 . . {in the form of multiple rows and multiple columns, all solar modules being coplanar}
- F24J 2002/0053 . . {Coplanar arrangements with frame overlapping portions}
- F24J 2002/0061 . . {Overlying arrangements similar to roof tiles}
- F24J 2002/0069 . . {Stepped arrangements, e.g. in parallel planes, without module overlapping}
- F24J 2002/0076 . . {Non-parallel arrangements}
- F24J 2002/0084 . . {Preventing shading effects}
- F24J 2002/0092 . . {Arrangements of solar thermal modules combined with solar PV modules}
- F24J 2/02 . Solar heat collectors with support for article heated, e.g. stoves, ranges, crucibles, furnaces or ovens using solar heat
- F24J 2/04 . Solar heat collectors having working fluid conveyed through collector
- F24J 2002/0405 . . {having a particular shape, e.g. prismatic, pyramidal}
- F24J 2002/0411 . . . {in the form of louvers}
- F24J 2002/0416 . . . {allowing change of position for optimization of heat collection}

F24J 2/0422	. . {Solar collectors integrated in fixed constructions, e.g. in buildings}
F24J 2/0427	. . . {in the form of a fence, a balustrade or a handrail}
F24J 2/0433	. . . {in the form of a window}
F24J 2/0438	. . . {in the form of a floor construction}
F24J 2/0444	. . . {in the form of a façade construction}
F24J 2/045	. . . {in the form of a roof construction ( <a href="#">F24J 2/0455</a> takes precedence)}
F24J 2/0455	. . . {in the form of shingles or tiles}
F24J 2/0461	. . {using pools or ponds}
F24J 2/0466	. . . {Salt gradient solar ponds}
F24J 2/0472	. . . {Floating solar collectors or covers}
F24J 2/0477	. . {having circuits for more than one working fluid ( <a href="#">F24J 2/30</a> takes precedence)}
F24J 2/0483	. . {having two or more passages for the same working fluid ( <a href="#">F24J 2/20</a> , <a href="#">F24J 2/24</a> take precedence)}
F24J 2/0488	. . {Solar heat collectors having absorber surfaces of a particular form}
F24J 2/0494	. . . {having two or more absorber surfaces}
F24J 2/05	. . surrounded by a transparent enclosure, e.g. evacuated solar collectors
F24J 2/055	. . . {the enclosure being cylindrical}
F24J 2/06	. . having concentrating elements ( <a href="#">optical elements or systems per se G02B</a> )
F24J 2/062	. . . {Prisms}
F24J 2/065	. . . {Fluorescent material}
F24J 2/067	. . . {Light guides}
F24J 2/07	. . . Receivers working at high temperature, e.g. for solar power plants
F24J 2002/075	. . . . {movable or adjustable}
F24J 2/08	. . . having lenses as concentrating elements
F24J 2/085	. . . . {having discontinuous faces, e.g. Fresnel lenses}
F24J 2/10	. . . having reflectors as concentrating elements
F24J 2002/1004	. . . . {Special shape not covered by <a href="#">F24J 2/1047</a> - <a href="#">F24J 2/18</a> }
F24J 2002/1009	. . . . . {corrugated}
F24J 2002/1014	. . . . . {curved}
F24J 2002/1019	. . . . . {dish-shaped}
F24J 2002/1023	. . . . . {trough-shaped}
F24J 2002/1028	. . . . . . {asymmetric}
F24J 2002/1033	. . . . . {spiral}
F24J 2002/1038	. . . . . {hyperbolic}
F24J 2002/1042	. . . . . {involutives}
F24J 2/1047	. . . . {having discontinuous faces}
F24J 2/1052	. . . . {flexible ( <a href="#">F24J 2/125</a> , <a href="#">F24J 2/145</a> take precedence)}
F24J 2/1057	. . . . {characterised by the material or the construction of the reflector}
F24J 2002/1061	. . . . {Reflective elements inside solar collector casings}
F24J 2002/1066	. . . . {Micro-reflectors}

F24J 2002/1071	. . . .	{in the form of reflective coatings}
F24J 2002/1076	. . . .	{Reflectors layout}
F24J 2002/108	. . . .	{Assemblies of spaced reflective elements on common support, e.g. Fresnel reflectors}
F24J 2002/1085	. . . .	{Reflectors formed by assemblies of adjacent similar reflective facets}
F24J 2002/109	. . . .	{Reflectors formed by assemblies of adjacent reflective elements having different orientation or different features}
F24J 2002/1095	. . . .	{Assemblies of spaced reflective elements in the form of grids, e.g. vertical or inclined reflective elements extending over heat absorbing elements}
F24J 2/12	. . . .	parabolic
F24J 2/125	. . . .	{flexible}
F24J 2/13	. . . .	hemispherical
F24J 2/14	. . . .	semi-cylindrical or cylindro-parabolic
F24J 2/145	. . . .	{flexible}
F24J 2/15	. . . .	conical
F24J 2/16	. . . .	having flat plates
F24J 2/18	. . . .	spaced, opposed interacting reflecting surfaces
F24J 2/20	. .	the working fluid being conveyed between plates
F24J 2/201	. . .	{having conduits of plastic material}
F24J 2/202	. . .	{having conduits formed by paired plates and internal partition means}
F24J 2/204	. . .	{having conduits formed by paired plates, only one of which is plane}
F24J 2/205	. . .	{having conduits formed by paired non-plane plates}
F24J 2/207	. . .	{having curved plate-like conduits, e.g. semi-spherical}
F24J 2/208	. . .	{having conduits formed by inflation of portions of a pair of joined sheets}
F24J 2/22	. . .	having extended surfaces, e.g. protrusions, corrugations ( <a href="#">F24J 2/28</a> takes precedence)
F24J 2/23	. .	the working fluid trickling freely {or flowing in a continuous film} over collector elements
F24J 2/24	. .	the working fluid being conveyed through tubular heat absorbing conduits
F24J 2002/241	. . .	{the conduits having a non-circular cross-section}
F24J 2/242	. . .	{the tubular conduits being integrated in a block; the tubular conduits touching each other}
F24J 2/243	. . .	{the tubular conduits being of plastic material}
F24J 2/244	. . .	{the tubular conduits are not fixed to heat absorbing plates and are not touching each other}
F24J 2/245	. . . .	{the conduits being parallel to each other}
F24J 2/246	. . . .	{the conduits being helically coiled}
F24J 2/247	. . . .	{the conduits being spirally coiled}
F24J 2/248	. . . .	{the conduits being otherwise bent, e.g. zig-zag}
F24J 2/26	. . .	having extended surfaces, e.g. protrusions ( <a href="#">F24J 2/28</a> takes precedence)
F24J 2002/261	. . . .	{Special fins}

- F24J 2002/263 . . . . . {extending obliquely}
- F24J 2/265 . . . . . {the conduits being parallel to each other}
- F24J 2/266 . . . . . {the conduits being spirally coiled}
- F24J 2/268 . . . . . {the conduits being otherwise bent, e.g. zig-zag}
- F24J 2/28 . . . . . having permeable mass, foraminous or porous materials
- F24J 2/30 . . . . . with means to exchange heat between plural fluids
- F24J 2/32 . . . . . having evaporator and condenser section, e.g. heat pipe
- F24J 2/34 . . . . . having heat storage mass
- F24J 2/345 . . . . . {Hot water storage}
- F24J 2/36 . . . . . Rollable or foldable collector units
- 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)
- F24J 2002/385 . . . . . {Calibration means; Methods for initial positioning of solar concentrators or solar receivers}
- F24J 2/40 . . . . . Control arrangements; {(Control of position for tracking F24J 2/38)}
- F24J 2/402 . . . . . {responsive to temperature}
- F24J 2/405 . . . . . {responsive to wind}
- F24J 2/407 . . . . . {for controlling transmission of solar radiation}
- F24J 2/42 . . . . . Solar heat systems not otherwise provided for {(solar heat systems in greenhouses A01G 9/243; distillation by solar energy C02F 1/14; devices for producing mechanical power from solar energy F03G 6/00; central heat systems using heat solar energy F24D 11/003, F24D 11/007, F24D 11/0221, F24D 11/0264; domestic hot-water supply systems using solar energy F24D 17/0015, F24D 17/0042, F24D 17/0063; air-conditioning systems using solar energy F24F 5/0046; refrigeration machines, plants or systems using solar energy F25B 27/002; drying solid materials or objects by radiation, e.g. from the sun F26B 3/28)}
- F24J 2/423 . . . . . {for swimming pools}
- F24J 2/426 . . . . . {for showers}
- F24J 2/44 . . . . . having thermosiphonic circulation
- F24J 2/46 . . . . . Component parts, details or accessories of solar heat collectors
- F24J 2002/4601 . . . . . {Arrangements for heat transfer optimization}
- F24J 2002/4603 . . . . . {Flow guiding means; Inserts inside conduits}
- F24J 2002/4605 . . . . . {Arrangements for one-way heat transfer, e.g. thermal diodes}
- F24J 2/4607 . . . . . {Safety or protection arrangements; Arrangements for preventing malfunction; Auxiliary devices, e.g. means for testing (control means F24J 2/40)}
- F24J 2/4609 . . . . . {Protective covers, lids; closure members (F24J 2/50 takes precedence)}
- F24J 2/461 . . . . . {Means for cleaning or for removing snow}
- F24J 2/4612 . . . . . {Means for preventing corrosion or protecting against contaminants, e.g. preventing condensations}
- F24J 2/4614 . . . . . {for draining rain water}
- F24J 2/4616 . . . . . {for maintaining vacuum, e.g. by using getters}
- F24J 2/4618 . . . . . {for preventing condensation}

F24J 2/462	. . . .	{for deaerating or degassing the working fluid}
F24J 2/4621	. . .	{Means for overtemperature protection (arrangements for draining the working fluid: <a href="#">F24J 2/4634</a> ); Means for overpressure protection}
F24J 2/4623	. . . .	{Arrangements for modifying heat collecting features, e.g. by defocusing or by changing the position of heat receiving elements}
F24J 2/4625	. . . .	{Cooling arrangements, e.g. by using external heat dissipating means or internal cooling circuits ( <a href="#">F24J 2/4627</a> takes precedence)}
F24J 2/4627	. . . .	{Arrangements for venting solar collector enclosures}
F24J 2/4629	. . . .	{Arrangements for preventing overpressure inside solar collector enclosures ( <a href="#">F24J 2/4627</a> takes precedence)}
F24J 2/463	. . . .	{Arrangements for preventing overpressure inside solar collector circuits}
F24J 2/4632	. . .	{Means for freezing protection (arrangements for draining the working fluid: <a href="#">F24J 2/4634</a> )}
F24J 2/4634	. . .	{Arrangements for draining the working fluid}
F24J 2/4636	. . .	{Arrangements to accommodate differential expansion of solar collector elements}
F24J 2/4638	. . .	{Arrangements for protecting solar collectors against adverse weather conditions ( <a href="#">F24J 2/4609</a> takes precedence)}
F24J 2/464	. .	{Casings}
F24J 2/4641	. . .	{characterised by using specific material}
F24J 2/4643	. . . .	{Plastic materials}
F24J 2/4645	. . . .	{Metallic materials}
F24J 2/4647	. .	{Means for fluidically interconnecting different solar collectors or for connecting solar connectors with other components; Headers; Fluid distributing means}
F24J 2/4649	. .	{Selection of particular working medium (materials for heat transfer <a href="#">C09K 5/00</a> )}
F24J 2/465	. .	{Arrangements of sealing means}
F24J 2/4652	. .	{Solar heat collectors having absorber surfaces provided with special coatings, e.g. anti-reflective coatings}
F24J 2/4654	. .	{Materials for the heat-exchange conduits ( <a href="#">F24J 2/201</a> , <a href="#">F24J 2/243</a> , <a href="#">F24J 2/48</a> take precedence)}
F24J 2002/4656	. .	{Arrangements for reinforcement of solar collector elements}
F24J 2002/4658	. .	{Fastening; Joining}
F24J 2002/4659	. . .	{by using hook and loop-type fasteners}
F24J 2002/4661	. . .	{by using hooks}
F24J 2002/4663	. . .	{by clamping}
F24J 2002/4665	. . .	{by clipping, e.g. by using snap connectors}
F24J 2002/4667	. . .	{by screwed connection}
F24J 2002/4669	. . .	{by using threaded elements, e.g. stud bolts}
F24J 2002/467	. . .	{by using form-fitting connection means, e.g. tongue and groove}
F24J 2002/4672	. . .	{by using toothed elements}
F24J 2002/4674	. . .	{by deforming the material, e.g. by crimping or clinching}
F24J 2002/4676	. . .	{by bonding, e.g. by using adhesives}
F24J 2002/4678	. . .	{by welding or brazing}

F24J 2002/4679	. . .	{Joining different materials}
F24J 2002/4681	. . . .	{Joining glass with non-glass elements}
F24J 2002/4683	. .	{Selection of particular materials}
F24J 2002/4685	. . .	{Ceramics}
F24J 2002/4687	. . .	{Concrete}
F24J 2002/4689	. . .	{Foams}
F24J 2002/469	. . .	{Carbone, e.g. graphite}
F24J 2002/4692	. . .	{Plastics}
F24J 2002/4694	. . .	{Textiles; Fabrics}
F24J 2002/4696	. . .	{Natural materials, e.g. wood}
F24J 2002/4698	. . .	{Recycled materials}
F24J 2/48	. .	characterised by absorber material
F24J 2/481	. . .	{of metallic material ( <a href="#">F24J 2/487</a> takes precedence)}
F24J 2/482	. . .	{of plastic ( <a href="#">F24J 2/488</a> takes precedence)}
F24J 2/484	. . .	{of ceramic; of concrete; of natural stone ( <a href="#">F24J 2/485</a> takes precedence)}
F24J 2/485	. . .	{using absorber coatings (radiation-absorbing paints <a href="#">C09D 5/32</a> )}
F24J 2/487	. . . .	{of metallic material}
F24J 2/488	. . . .	{of plastic material}
F24J 2/50	. .	Transparent coverings
F24J 2002/501	. . .	{Special shape}
F24J 2002/502	. . . .	{in the form of multiple covering elements}
F24J 2002/503	. . . .	{in the form of curved covering elements}
F24J 2/505	. . .	{characterised by using specific material}
F24J 2/506	. . . .	{plastic material}
F24J 2/507	. . .	{using evacuated elements ( <a href="#">F24J 2/05</a> takes precedence)}
F24J 2002/508	. . .	{Transparent insulation; Convection preventing members}
F24J 2/51	. .	Thermal insulation ( <a href="#">F24J 2/50</a> takes precedence)
F24J 2/515	. . .	{characterised by the material}
F24J 2/52	. .	Arrangement of mountings or supports
F24J 2/5201	. . .	{Stationary supporting structures for solar modules; Load-bearing elements for movable supporting structures}
F24J 2/5203	. . . .	{comprising elongated rigid mounting elements, e.g. mounting profiles or rails for covering a building surface with solar modules; Module frames ( <a href="#">F24J 2/523</a> takes precedence)}
F24J 2/5205	. . . . .	{Substantially planar profile assemblies, e.g. grids comprising coplanar profiles or stacked profiles}
F24J 2/5207	. . . . .	{comprising profiles of particular shape having in cross-section first and second module supporting portions for coupling adjacent solar modules}
F24J 2/5209	. . . . .	{Substantially coplanar profile assemblies comprising longitudinal profiles laterally coupled with transversal profiles}
F24J 2/5211	. . . . .	{Solar module peripheral frames}

F24J 2002/5213	. . . . .	{Special profiles}
F24J 2002/5215	. . . . .	{having hollow parts with closed cross-section}
F24J 2002/5216	. . . . .	{having circular or oval cross-section}
F24J 2002/5218	. . . . .	{having a central web, e.g. I-shaped, inverted T- shaped}
F24J 2002/522	. . . . .	{U-, C- or O-shaped; Hat profiles}
F24J 2002/5222	. . . . .	{in the form of corrugated profiles}
F24J 2002/5224	. . . . .	{having curved portions}
F24J 2002/5226	. . . . .	{having undercut grooves}
F24J 2/5228	. . . . .	{comprising plate-like mounting elements, e.g. profiled or corrugated plates; Plate-like module frames ( <a href="#">F24J 2/523</a> takes precedence)}
F24J 2/523	. . . . .	{comprising elongated standing elements, e.g. posts, legs; Standing structures for supporting solar modules at defined orientation; Three-dimensional frameworks; Volumetric supporting structures, e.g. box-like elements or shaped bodies}
F24J 2/5232	. . . . .	{Posts coupled with upper profiles}
F24J 2/5233	. . . . .	{Profile arrangements, e.g. assemblies of base profiles with vertical or inclined profiles, three-dimensional frameworks ( <a href="#">F24J 2/5232</a> takes precedence)}
F24J 2/5235	. . . . .	{comprising bent plates or assemblies of plates}
F24J 2/5237	. . . . .	{comprising shaped bodies, e.g. molded box-like elements, concrete elements, foamed elements; Massive supporting structures}
F24J 2/5239	. . . . .	{Interconnected assemblies of stands; Stands having first and second module supporting portions for coupling adjacent modules}
F24J 2/5241	. . . . .	{comprising elongated non rigid elements, e.g. straps, wires, ropes}
F24J 2/5243	. . . . .	{Fixation means, e.g. connectors or fasteners}
F24J 2/5245	. . . . .	{Connectors for anchoring solar modules or supporting elements to the ground or to building structures}
F24J 2/5247	. . . . .	{in the form of bent strips or assemblies of strips; Hook-like connectors; Connectors to be mounted between building covering elements}
F24J 2/5249	. . . . .	{for anchoring to protrusions of buildings, e.g. to corrugations or to standing seams}
F24J 2/525	. . . . .	{Ground anchoring means; Foundations for supporting elements; Massive elements for anchoring supporting structures to the ground or to flat horizontal surfaces}
F24J 2/5252	. . . . .	{Connectors for fixing solar modules, or solar module peripheral frames to supporting elements, e.g. to profiled mounting members}
F24J 2/5254	. . . . .	{Solar module side connectors or base connectors}
F24J 2/5256	. . . . .	{Clamping or clipping elements}
F24J 2/5258	. . . . .	{with clamping action by using screw-threaded elements}
F24J 2/526	. . . . .	{Connectors for coupling adjacent supporting elements together, e.g. profile to profile connectors}
F24J 2/5262	. . . . .	{Connectors for coupling adjacent solar modules or solar module peripheral frames together ( <a href="#">F24J 2/5252</a> takes precedence)}



F24J 2/5264	. . . .	{comprising means for adjusting the final position or the final orientation of a supporting element relative to another one or relative to a mounting surface; comprising means for compensating mounting tolerances}
F24J 2/5266	. . .	{adapted for non-rotary movement}
F24J 2/5267	. . .	{Waterborne solar collectors}
F24J 2/5269	. . . .	{Moving platforms}
F24J 2/5271	. . .	{Airborne solar collectors, e.g. using inflated structures ( <a href="#">F24J 2/0472</a> , <a href="#">F24J 2/5267</a> take precedence)}
F24J 2002/5273	. . .	{Details; Special support components or methods}
F24J 2002/5275	. . . .	{Arrangements for mounting elements inside solar collectors; Spacers inside solar collectors}
F24J 2002/5277	. . . .	{Foldable support elements}
F24J 2002/5279	. . . .	{Stackable support elements}
F24J 2002/5281	. . . .	{Methods for installing support elements}
F24J 2002/5283	. . . .	{Supports with play between elements}
F24J 2002/5284	. . . .	{Filling or spacing means; Elastic means}
F24J 2002/5286	. . . .	{Tensioning means}
F24J 2002/5288	. . . .	{Means for preventing movements, e.g. stops}
F24J 2002/529	. . . .	{Means for accommodating irregularities on mounting surface; Tolerance compensation means}
F24J 2002/5292	. . . .	{Ballasting means}
F24J 2002/5294	. . . .	{Sealing means between support elements and mounting surface}
F24J 2002/5296	. . . .	{Sealing means between support elements, e.g. overlapping arrangements; Gap closing arrangements}
F24J 2002/5298	. . . .	{Means for preventing theft; Locking means}
F24J 2/54	. . .	specifically adapted for rotary movement {( <a href="#">F24J 2/5269</a> takes precedence)}
F24J 2/5403	. . . .	{with only one rotation axis}
F24J 2/5406	. . . . .	{with vertical axis}
F24J 2/541	. . . . .	{with horizontal axis}
F24J 2/5413	. . . . .	{with inclined axis}
F24J 2/5417	. . . . .	{with two rotation axis}
F24J 2/542	. . . . .	{with vertical primary axis}
F24J 2/5424	. . . . .	{with horizontal primary axis}
F24J 2/5427	. . . . .	{with inclined primary axis}
F24J 2/5431	. . . . .	{with more than two rotation axis or with multiple degrees of freedom}
F24J 2002/5434	. . . . .	{Special components}
F24J 2002/5437	. . . . .	{Driving means}
F24J 2002/5441	. . . . .	{hydraulic or pneumatic}
F24J 2002/5444	. . . . .	{Coupling means}
F24J 2002/5448	. . . . .	{Transmissions}
F24J 2002/5451	. . . . .	{in the form of articulated bars}
F24J 2002/5455	. . . . .	{in the form of compasses, scissors or parallelograms}



F24J 2002/5458	. . . . .	{in the form of flexible elements, e.g. belts, chains, ropes}
F24J 2002/5462	. . . . .	{in the form of gearings or rack-and-pinion transmissions}
F24J 2002/5465	. . . . .	{in the form of threaded elements}
F24J 2002/5468	. . . . .	{for moving several solar collectors by common transmission elements}
F24J 2002/5472	. . . . .	{for deriving one movement from another one, e.g. for deriving elevation movement from azimuth movement}
F24J 2002/5475	. . . . .	{Movement guiding means}
F24J 2002/5479	. . . . .	{Tracks}
F24J 2002/5482	. . . . .	{Bearings}
F24J 2002/5486	. . . . .	{Hinged elements; Pin connections}
F24J 2002/5489	. . . . .	{Spherical joints}
F24J 2002/5493	. . . . .	{Load balancing means, e.g. use of counter-weights}
F24J 2002/5496	. . . . .	{Movement dampening means; Braking means}

**F24J 3/00**      **Other production or use of heat, not derived from combustion (use of solar heat F24J 2/00)**

F24J 3/003	. . . . .	{using heat resulting from internal friction of a moving fluid or from friction between a fluid and a moving body}
F24J 3/006	. . . . .	{the fluid passing through a restriction means}
F24J 3/06	. . . . .	using natural heat
F24J 3/08	. . . . .	using geothermal heat
F24J 3/081	. . . . .	{by circulating a working fluid through underground channels, the working fluid not coming into direct contact with the ground}
F24J 3/082	. . . . .	{Compact tube assemblies inserted into the ground, e.g. geothermal probes}
F24J 3/083	. . . . .	{in the form of bent tubes or in the form of tubes assembled with connectors or with return headers}
F24J 3/084	. . . . .	{in the form of tubes being closed at one end, i.e. return type}
F24J 3/085	. . . . .	{by injecting a working fluid directly into the ground or by using underground water, e.g. systems using injection and recovery wells}
F24J 3/086	. . . . .	{by injecting a working fluid into a closed well; by using intermediate working fluids, e.g. by using heat pipes}
F24J 2003/087	. . . . .	{Component parts, details or accessories}
F24J 2003/088	. . . . .	{Methods for installation}
F24J 2003/089	. . . . .	{Control arrangements}

**F24J 2200/00**      **Prediction; Simulation**

F24J 2200/04	. . . . .	for solar techniques
F24J 2200/06	. . . . .	for geothermal techniques