CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G01 MEASURING (counting G06M); TESTING
(NOTES omitted)

G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR (sensing temperature changes for compensating measurements of other variables for compensating readings of instruments for variation in temperature, see G01D or relevant subclasses for variable measured; radiation pyrometry G01J; investigating or analysing materials by use of thermal means G01N 25/00; compound sensitive elements, e.g. bimetallic, G12B 1/02)

NOTES

1. In this subclass, the following term is used with the meaning indicated :
   - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
2. Attention is drawn to the Notes following the title of class G01.
3. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "microstructural devices" and "microstructural systems".

1/00 **Details of thermometers not specially adapted for particular types of thermometer** (circuits for reducing thermal inertia G01K 7/42)

1/02 . Special applications of indicating or recording means, e.g. for remote indications

1/022 . . {recording means}

1/024 . . {for remote indication (remote indication per se G08C)}

1/026 . . {arrangements for monitoring a plurality of temperatures, e.g. by multiplexing}

1/028 . . {arrangements for numerical indication}

1/04 . . Scales

1/045 . . . {temperature indication combined with the indication of another variable (indicating of human comfort G01W 1/17)}

1/06 . . . Arrangements for facilitating reading, e.g. illumination, magnifying glass

1/065 . . . . {of liquid column thermometers}

1/08 . Protective devices, e.g. casings

1/083 . . {for clinical thermometers, e.g. contaimination preventing sleeves}

1/086 . . . {for tympanic thermometers}

1/10 . . for preventing chemical attack

1/105 . . . {for siderurgical use}

1/12 . . for preventing damage due to heat overloading

1/125 . . . {for siderurgical use}

1/14 . Supports; Fastening devices; Mounting thermometers in particular locations

1/143 . . {for measuring surface temperatures, e.g. of pipe walls}

1/146 . . {arrangements for moving thermometers to or from a measuring position}

1/16 . Special arrangements for conducting heat from the object to the sensitive element

1/165 . . {for application in zero heat flux sensors}

1/18 . . for reducing thermal inertia

1/20 . Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature

1/22 . . by means of fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the fluid

1/24 . . by means of compounded strips or plates, e.g. by bimetallic strips

1/26 . Compensating for effects of pressure changes

3/00 **Thermometers giving results other than momentary value of temperature** (G01K 7/42 takes precedence)

3/005 . {Circuits arrangements for indicating a predetermined temperature (fire detection G08B 17/00)}

3/02 . giving means values; giving integrated values

3/04 . . in respect of time

3/06 . . in respect of space

3/08 . giving differences of values (using thermoelectric elements G01K 7/02); giving differentiated values

3/10 . . in respect of time, e.g. reacting only to a quick change of temperature

3/12 . . . based upon expansion or contraction of materials

3/14 . . in respect of space

2003/145 . . . {Hotspot localization}

5/00 **Measuring temperature based on the expansion or contraction of a material** (G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00; of vapour arising from a liquid G01K 11/02; thermally-actuated switches H01H)

5/02 . the material being a liquid (contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32)
5/025 . . {Manufacturing of this particular type of thermometer}
5/04 . . Details
5/06 . . . Arrangements for driving back the liquid column
5/08 . . . Capillary tubes
5/10 . . . Containers for the liquid
5/12 . . . Selection of liquid compositions
5/14 . . the liquid displacing a further liquid column or a solid body (for maximum or minimum indication G01K 5/20)
5/16 . . with electric contacts
5/18 . . with electric conversion means for final indication
5/20 . . with means for indicating a maximum or a minimum or both (G01K 5/22 takes precedence)
5/22 . . with provision for expansion indicating over not more than a few degrees, e.g. clinical thermometer
5/225 . . . {with means for indicating a maximum, e.g. a constriction in the capillary tube}
5/24 . . with provision for measuring the difference between two temperatures
5/26 . . with provision for adjusting zero point of scale, e.g. Beckmann thermometer
5/28 . the material being a gas (contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32)
5/30 . . the gas displacing a liquid column
5/32 . the material being a fluid contained in a hollow body having parts which are deformable or displaceable (under pressure developed by evaporation G01K 11/04; pressure measuring devices in general G01L)
5/323 . . {Selection of fluid compositions}
5/326 . . {using a fluid container connected to the deformable body by means of a capillary tube}
5/34 . . the body being a capsule (G01K 5/36, G01K 5/42 take precedence)
5/36 . . the body being a tubular spring, e.g. Bourdon tube
5/38 . . . of spiral formation
5/40 . . . of helical formation
5/42 . . the body being a bellows
5/44 . . the body being a cylinder and piston
5/46 . . with electric conversion means for final indication
5/465 . . . {using electrical contact making or breaking devices}
5/48 . the material being a solid
5/483 . . {using materials with a configuration memory, e.g. Ni-Ti alloys}
5/486 . . {using microstructures, e.g. made of silicon (G01K 7/015, G01K 7/028, G01K 7/226, G01K 17/006 take precedence)}
5/50 . . arranged for free expansion or contraction
5/52 . . . with electrical conversion means for final indication
5/54 . . consisting of pivotally-connected elements
5/56 . . constrained so that expansion or contraction causes a deformation of the solid
5/58 . . . the solid body being constrained at more than one point, e.g. rod, plate, diaphragm (G01K 5/62 takes precedence)
5/60 . . . . the body being a flexible wire or ribbon
5/62 . . . the solid body being formed of compounded strips or plates, e.g. bimetallic strip
5/64 . . . . Details of the compounds system
5/66 . . . . . Selection of composition of the components of the system
5/68 . . . . . Shape of the system
5/70 . . . . specially adapted for indicating or recording
5/72 . . . . . with electric transmission means for final indication

7/00 Measuring temperature based on the use of electric or magnetic elements directly sensitive to heat (giving results other than momentary value of temperature G01K 3/00; measuring electric or magnetic variables G01R)**; {Power supply, e.g. by thermoelectric elements}**

7/003 . {using pyroelectric elements (radiation pyrometers G01J 5/00)}
7/006 . {using superconductive elements}
7/01 . using semiconducting elements having PN junctions (G01K 7/02, G01K 7/16, G01K 7/30 take precedence)
7/015 . . {using microstructures, e.g. made of silicon}
7/02 . using thermoelectric elements, e.g. thermocouples ({cooling arrangements in electronic devices using the Peltier effect H01L 23/38;} thermo-electric or thermo-magnetic devices per se H01L 35/00, H01L 37/00)
7/021 . . {Particular circuit arrangements (G01K 7/026, G01K 7/12, G01K 7/14 take precedence)}
7/023 . . {provided with specially adapted connectors (connectors per se H01R)}
7/025 . . {expendable thermocouples}
7/026 . . {Arrangements for signalling rupture or disconnection of the thermocouple}
7/028 . . {using microstructures, e.g. made of silicon}
7/04 . . the object to be measured not forming one of the thermo-electric materials
7/06 . . . the thermo-electric materials being arranged one within the other with the junction at one end exposed to the object, e.g. sheathed type
7/08 . . the object to be measured forming one of the thermo-electric materials, e.g. pointed type
7/10 . . Arrangements for compensating for auxiliary variables, e.g. length of lead
7/12 . . . Arrangements with respect to the cold junction, e.g. preventing influence of temperature of surrounding air
7/13 . . . . Circuits for cold-junction compensation
7/14 . . Arrangements for modifying the output characteristic, e.g. linearising
7/16 . using resistive elements (resistive elements per se H01C, H01L)
2007/163 . . {provided with specially adapted connectors}
2007/166 . . {Electrical time domain reflectometry}
7/18 . . the element being a linear resistance, e.g. platinum resistance thermometer (G01K 7/26 takes precedence)

7/183 . . . {characterised by the use of the resistive element}
7/186 . . . {using microstructures}
7/20 . . . in a specially-adapted circuit, e.g. bridge circuit
7/203 . . . . {in an oscillator circuit}
7/206 . . . . {in a potentiometer circuit}
7/21 . . . . for modifying the output characteristic, e.g. linearising
7/22 . . the element being a non-linear resistance, e.g. thermistor (G01K 7/26 takes precedence)
7/223 . . . {characterised by the shape of the resistive element}
7/226 . . . {using microstructures, e.g. silicon spreading resistance}
7/24 . . . in a specially-adapted circuit, e.g. bridge circuit
7/245 . . . . {in an oscillator circuit}
7/25 . . . . for modifying the output characteristic, e.g. linearising
7/26 . . the element being an electrolyte
7/28 . . . in a specially-adapted circuit, e.g. bridge circuit
7/30 . using thermal noise of resistances or conductors
7/32 . using change of resonant frequency of a crystal
7/34 . using capacitative elements (capacitors per se H01G)
7/343 . . {the dielectric constant of which is temperature dependant}
7/346 . . {for measuring temperature based on the time delay of a signal through a series of logical ports}
7/36 . using magnetic elements, e.g. magnets, coils (magnetic elements per se H01F)
7/38 . . the variations of temperature influencing the magnetic permeability
7/40 . using ionisation of gases
7/42 . Circuits for reducing thermal inertia; Circuits for predicting the stationary value of temperature
2007/422 . . {Dummy objects used for estimating temperature of real objects}
7/425 . . {Thermal management of integrated systems}
7/427 . . {Temperature calculation based on spatial modeling, e.g. spatial inter- or extrapolation}

9/00 Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer (not giving momentary value of temperature G01K 3/00)

11/00 Measuring temperature based upon physical or chemical changes not covered by groups G01K 3/00, G01K 5/00, G01K 7/00 or G01K 9/00

11/003 . {using absorption or generation of gas, e.g. hydrogen}
11/006 . {using measurement of the effect of a material on microwaves or longer electromagnetic waves, e.g. measuring temperature via microwaves emitted by the object (G01K 17/003, G01J 5/00 take precedence; measuring the effect of a material on X-, gamma- or particle radiation G01K 11/30)}
11/02 . using evaporation or sublimation, e.g. by observing boiling
11/04 . . from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour
11/06 . using melting, freezing, or softening
11/08 . . of disposable test bodies, e.g. cone
11/10 . using sintering
11/12 . using change of colour or translucency (G01K 11/32 takes precedence; heat-sensitive sheets for use in thermography B41M 5/00; {tenebrescent compositions C09K 9/00})
11/125 . . {using change in reflectance}
11/14 . . of inorganic materials
11/16 . . of organic materials
11/165 . . . {liquid crystals (liquid crystal compositions C09K 19/00; electro-optic liquid crystals G02F 1/13)}
11/18 . . of materials which change translucency
11/20 . using thermoluminescent materials (G01K 11/32 takes precedence)
11/22 . using measurement of acoustic effects
11/24 . . of the velocity of propagation of sound
11/26 . . of resonant frequencies
11/265 . . . {using surface acoustic wave [SAW]}
11/28 . using measurements of density {(measuring density in general G01N 9/00)}
11/30 . using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation
11/32 . using changes in transmission, scattering or fluorescence in optical fibres {(in general G01D 5/268)}
11/3206 . . {at discrete locations in the fibre, e.g. by means of Bragg gratings}
11/3213 . . . {using changes in fluorescence, e.g. at the distal end of the fibre}
2011/322 . . {using Brillouin scattering}
2011/324 . . {using Raman scattering}

13/00 Adaptations of thermometers for specific purposes

13/002 . {for measuring body temperature (G01K 5/22 takes precedence; for prediction aspects G01K 7/42; diagnostic temperature sensing A61M 39/0247)}
13/004 . . {Infrared clinical thermometers, e.g. tympanic}
13/006 . {for cryogenic purposes}
13/008 . . {using microstructures, e.g. made of silicon}
13/02 . for measuring temperature of moving fluids or granular materials capable of flow
13/022 . . {Suction thermometers}
2013/024 . . {Moving gas}
2013/026 . . {Moving liquid}
13/028 . . {for use in total air temperature [TAT] probes}
13/04 . for measuring temperature of moving solid bodies
13/06 . . in linear movement
13/08 . . in rotary movement
13/10 . for measuring temperature within piled or stacked materials (by special arrangements for conducting heat from the object to the sensitive heat element G01K 1/16)
13/12 . combined with sampling devices for measuring temperatures of samples of materials
13/125 . . {for siderurgical purposes}

15/00 Testing or calibrating of thermometers

15/002 . {Calibrated temperature sources, temperature standards therefor (arrangements with respect to the cold junction of thermo-electric elements G01K 7/12)}
15/005 . {Calibration}
15/007 . {Testing}

17/00 **Measuring quantity of heat** (measuring temperature by calorimetry G01K 3/00 - G01K 11/00; specially adapted for measuring thermal properties of materials, e.g. specific heat, heat of combustion G01N)

17/003 . {for measuring the power of light beams, e.g. laser beams}

17/006 . {Microcalorimeters, e.g. using silicon microstructures}

17/02 . Calorimeters using transport of an indicating substances, e.g. evaporation calorimeters

17/025 . . {where evaporation, sublimation or condensation caused by heating or cooling, is measured}

17/04 . Calorimeters using compensation methods {, i.e. where the absorbed or released quantity of heat to be measured is compensated by a measured quantity of heating or cooling}

17/06 . Measuring quantity of heat conveyed by flowing media, e.g. in heating systems (G01K 17/02, G01K 17/04 take precedence) {e.g. the quantity of heat in a transporting medium, delivered to or consumed in an expenditure device}

17/08 . . based upon measurement of temperature difference {or of a temperature}

17/10 . . . between an inlet and an outlet point, combined with measurement of rate of flow of the medium {if such, by integration during a certain time-interval}

17/12 . . . . Indicating product of flow and temperature difference directly {or temperature}

17/14 . . . . . using mechanical means for both measurements

17/16 . . . . . using electrical {or magnetic} means for both measurements

17/18 . . . . . using electrical {or magnetic} means for one measurement and mechanical means for the other

17/185 . . . . . {where the indicating-instrument is driven electrically or magnetically by the temperature-measurement device and mechanically by the flow-measurement device}

17/20 . . . across a radiating surface, combined with ascertainment of the heat transmission coefficient {(materials therefor G01K 17/08)}

19/00 **Testing or calibrating calorimeters**

2201/00 **Application of thermometers in air-conditioning systems**

2201/02 . in vehicles

2203/00 **Application of thermometers in cryogenics**

2205/00 **Application of thermometers in motors, e.g. of a vehicle**

2205/02 . for measuring inlet gas temperature

2205/04 . for measuring exhaust gas temperature

2207/00 **Application of thermometers in household appliances**

2207/02 . for measuring food temperature

2207/04 . . for conservation purposes

2207/06 . . for preparation purposes

2207/08 . . with food recipients having temperature sensing capability

2211/00 **Thermometers based on nanotechnology**

2213/00 **Temperature mapping**

2215/00 **Details concerning sensor power supply**

2217/00 **Temperature measurement using electric or magnetic components already present in the system to be measured**

2219/00 **Thermometers with dedicated analog to digital converters**