G01P

COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G01 MEASURING; TESTING
(NOTES omitted)

G01P MEASURING LINEAR OR ANGULAR SPEED, ACCELERATION, DECELERATION, OR SHOCK; INDICATING PRESENCE, ABSENCE, OR DIRECTION, OF MOVEMENT (measuring or recording blood flow A61B 5/02, A61B 8/06; monitoring speed or deceleration of electrically-propelled vehicles B60L 3/00; vehicle lighting systems adapted to indicate speed B60Q 1/54; determining position or course in navigation, measuring ground distance in geodesy or surveying G01C; combined measuring devices for measuring two or more variables of movement G01C 23/00; measuring velocity of sound G01H; measuring velocity of light G01J 7/00; measuring direction or velocity of solid objects by reception or emission of radiowaves or other waves and based on propagation effects, e.g. Doppler effect, propagation time, direction of propagation, G01S; measuring speed of nuclear radiation G01T; measuring acceleration of gravity G01V; { measuring or recording the speed of trains B61L 23/00; speed indicators incorporated in motor vehicles B60K 35/00; measuring frequency or phase G01R; traffic control G08G})

NOTES

1. This subclass covers measuring direction or velocity of flowing fluids using propagation effects of radiowaves or other waves caused in the fluid itself, e.g. by laser anemometer, by ultrasonic flowmeter with "sing-around-system".
2. Attention is drawn to the Notes following the title of class G01.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Details of instruments
1/003 . . [used for damping]
1/006 . . [used for thermal compensation]
1/02 . . Housings
1/023 . . . [for acceleration measuring devices]
1/026 . . . [for speed measuring devices, e.g. pulse generator]
1/04 . Special adaptations of driving means
1/06 . . [Indicating or recording devices, e.g. for remote indication (indicating or recording in general G01D; registering or indicating working conditions of vehicles G07C 5/00)]
1/07 . Indicating devices, e.g. for remote indication (indicating working conditions of vehicles G07C 5/00)
1/08 . . Arrangements of scales, pointers, lamps or acoustic indicators, e.g. in automobile speedometers
1/10 . . . for indicating predetermined speeds
1/103 . . . . [by comparing the value of the measured signal with one or several reference values (in general G01R 17/00)]
1/106 . . . . [by comparing the time duration between two impulses with a reference time]
1/11 . . . . by the detection of the position of the indicator needle
1/12 . Recording devices (indicating working conditions of vehicles G07C 5/00)
1/122 . . . [Speed recorders]
1/125 . . . [with recording discs]
1/127 . . . . [for acceleration values]
1/14 . . for permanent recording ((G01P 1/125 takes precedence))
1/16 . . . for erasable recording, e.g. magnetic recording
3/00 Measuring linear or angular speed; Measuring differences of linear or angular speeds (G01P 5/00 - G01P 11/00 take precedence; {direction and speed indication G01P 13/045); counting mechanisms G06M)

NOTE

The sub-groups of this group are distinguished by the method of measurement which is of major importance. Thus the mere application of other methods for giving a final indication does not affect the classification.
3/02 . . . Devices characterised by the use of mechanical means
3/04 . . . by comparing two speeds
3/06 . . . using a friction gear
3/08 . . . using differential gearing
3/10 . . . by actuating an indicating element, e.g. pointer, for a fixed time
3/12 . . . by making use of a system excited by impact
3/14 . . . by exciting one or more mechanical resonance systems
3/16 . . . by using centrifugal forces of solid masses (governors G05D 13/10)
3/18 . . . transferred to the indicator by mechanical means
3/20 . . . transferred to the indicator by fluid means
3/22 . . . transferred to the indicator by electric or magnetic means
3/24 . . . by using friction effects (G01P 3/06 takes precedence)
3/26 . . Devices characterised by the use of fluids
3/263 . . . [by using fluidic impulse generators]
3/266 . . . [by using a vortex chamber]
3/28 . . . by using pumps
3/30 . . . by using centrifugal forces of fluids
3/32 . . . transferred in a rotary container communicating with a fixed container
3/34 . . . by using friction effects
3/36 . . Devices characterised by the use of optical means, e.g. using infra-red, visible, or ultra-violet light (G01P 3/68 takes precedence; gyroimeters using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams G01C 19/64)
3/363 . . . [by using a ring laser (ring lasers in general H01S 3/083)]
3/366 . . . [by using diffraction of light (for measuring speed of fluids G01P 5/26)]
3/38 . . . using photographic means
3/40 . . . using stroboscopic means
3/42 . . Devices characterised by the use of electric or magnetic means (G01P 3/66 takes precedence; measuring electric or magnetic values in general G01R)
3/44 . . . for measuring angular speed (G01P 3/56 takes precedence)
3/443 . . . . . . [mounted in bearings (bearings F16C)]
3/446 . . . . . . [mounted between two axially spaced rows of rolling elements]
3/46 . . . . by measuring amplitude of generated current or voltage [in general G01R 19/00]
3/465 . . . . . . [by using dynamo-electro tachometers or electric generator]
3/48 . . . . by measuring frequency of generated current or voltage [in general G01R 23/00]
3/4802 . . . . . [by using electronic circuits in general]
3/4805 . . . . . [by using circuits for the electrical integration of the generated pulses (measuring impulse frequency by integration G01R 23/00)]
3/4807 . . . . . [by using circuits for the detection of the pulses delivered by the ignition system of an internal combustion engine]
3/481 . . . . . of pulse signals
3/4815 . . . . . [using a pulse wire sensor, e.g. Wiegand wire]
3/482 . . . . . delivered by nuclear radiation detectors
3/483 . . . . . delivered by variable capacitance detectors
3/484 . . . . . delivered by contact-making switches
3/486 . . . . . delivered by photo-electric detectors
3/487 . . . . . delivered by rotating magnets
3/488 . . . . . delivered by variable reluctance detectors
3/489 . . . . . Digital circuits therefor
3/49 . . . . . using eddy currents
3/495 . . . . . where the indicating means responds to forces produced by the eddy currents and the generating magnetic field
3/4953 . . . . . [with a counter for the covered distance incorporated (measuring the covered distance G01C 22/00)]
3/4956 . . . . . [with thermal compensation]
3/50 . . . for measuring linear speed (G01P 3/56 takes precedence)
3/505 . . . . . [by using eddy currents]
3/52 . . . . . by measuring amplitude of generated current or voltage
3/54 . . . . . by measuring frequency of generated current or voltage
3/56 . . . . . for comparing two speeds
3/565 . . . . . . [by measuring or by comparing the phase of generated current or voltage (phase comparators per se H03D 13/00; phase measurement G01R 25/00)]
3/58 . . . . . . by measuring or comparing amplitudes of generated currents or voltages [ (amplitude comparators H03K 5/24)]
3/60 . . . . . . by measuring or comparing frequency of generated currents or voltages [ (frequency comparators H03K 5/26)]
3/62 . . . Devices characterised by the determination or the variation of atmospheric pressure with height to measure the vertical components of speed (measuring pressure in general G01L)
3/64 . . . Devices characterised by the determination of the time taken to traverse a fixed distance
3/66 . . . . . using electric or magnetic means (G01P 3/80 takes precedence; measuring short time intervals G04F 8/00, G04F 10/00)
3/665 . . . . . . [for projectile velocity measurements]
3/68 . . . . using optical means, i.e. using infra-red, visible, or ultra-violet light (G01P 3/80 takes precedence ; by reflection of waves G01S 17/58)]
3/685 . . . . . . [for projectile velocity measurements]
3/80 . . . . . using auto-correlation or cross-correlation detection means
3/803 . . . . . . [in devices of the type to be classified in G01P 3/66]
3/806 . . . . . . [in devices of the type to be classified in G01P 3/68]
5/00 Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft (application of speed-measuring devices for measuring volume of fluid G01F)
5/001 . . . [Full-field flow measurement, e.g. determining flow velocity and direction in a whole region at the same time, flow visualisation]
5/003 . . . [by measuring fluid level in front of an obstacle]
NOTE

Absolute angular speed sensors are classified under G01C 19/00 and s.gr.

9/02 . [using rotary gyroscopes]
with conversion into electric or magnetic values

for indicating maximum value

using members subjected to a permanent deformation

of a particular type of spring-mass-system for defining the displacement of a seismic mass due to an external acceleration

for defining in-plane movement of the mass, i.e. movement of the mass in the plane of the substrate

for single degree of freedom of movement of the mass

for translational movement of the mass, e.g. shuttle type

for pivoting movement of the mass, e.g. in-plane pendulum

for two degrees of freedom of movement of a single mass

for defining out-of-plane movement of the mass

for single degree of freedom of movement of the mass

the mass being of the paddle type being suspended at one of its longitudinal ends

the mass being of the paddle type having the pivot axis between the longitudinal ends of the mass, e.g. seesaw configuration

the mass constituting a pendulum having the pivot axis disposed symmetrically between the longitudinal ends, the center of mass being shifted away from the plane of the pendulum which includes the pivot axis

the mass being suspended so as to only allow movement perpendicular to the plane of the substrate, i.e. z-axis sensor

the mass being suspended at more than one of its sides, e.g. membrane-type suspension, so as to permit multi-axis movement of the mass

the mass being of clover leaf shape

using a plurality of spring-mass systems being arranged on one common planar substrate, the systems not being mechanically coupled and the sensitive direction of each system being different

using a plurality of mechanically coupled spring-mass systems, the sensitive direction of each system being different

using a plurality of spring-mass systems, each system having a different range of sensitivity to acceleration

using a particular shape of the mass, e.g. annular

using a particular shape of the suspension spring

using a torsional suspension spring

[being provided with a particular means for indicating angular acceleration]

[with indication of predetermined acceleration values (G01P 15/135 takes precedence)]

[by non-contact electron transfer, i.e. electron tunneling]

[by thermal pick-up (G01P 15/008 takes precedence)]

[by potentiometers]

[by metal resistance strain gauges, e.g. wire resistance strain gauges]

[by piezo-resistive elements, e.g. semiconductor strain gauges]

[by semiconductor devices comprising at least one PN junction, e.g. transistors]

[by capacitive pick-up]

[by measuring the force required to restore a proofmass subjected to inertial forces to a null position]

[with electrostatic counterbalancing means]

[with electromagnetic counterbalancing means]

[with piezo-electric counterbalancing means]

by making use of contacts which are actuated by a movable inertial mass

by making use of gyroscopes (gyroscopes per se G01C 19/00)

by evaluating the time-derivative of a measured speed signal

[for measuring angular accelerations]

[being provided with particular means being integrated into a MEMS accelerometer structure for providing particular additional functionalities to those of a spring mass system]

[using integrated signal processing circuitry]

[using self-test structures integrated into the microstructure]

[using stopper structures for limiting the travel of the seismic mass]

[using means for preventing stiction of the seismic mass to the substrate]

[using integrated interconnect structures]

[for providing wafer-level encapsulation]

[for providing damping of vibrations]

[by magnetostrictive pick-up]

[by semiconductor devices comprising at least one PN junction, e.g. transistors]

[by piezo-resistive elements, e.g. semiconductor strain gauges]

[by metal resistance strain gauges, e.g. wire resistance strain gauges]

[by piezo-electric elements, e.g. semiconductor strain gauges]

[by semiconductor devices comprising at least one PN junction, e.g. transistors]

[by capacitive pick-up]

[by measuring the force required to restore a proofmass subjected to inertial forces to a null position]

[with electrostatic counterbalancing means]

[with electromagnetic counterbalancing means]

[with piezo-electric counterbalancing means]

[by making use of contacts which are actuated by a movable inertial mass]

[by making use of gyroscopes (gyroscopes per se G01C 19/00)]

[by evaluating the time-derivative of a measured speed signal]

[for measuring angular accelerations]

in two or more dimensions

Testing or calibrating of apparatus or devices covered by the preceding groups
21/02  . of speedometers
21/025 .  (for measuring speed of fluids; for measuring speed of bodies relative to fluids (for measuring volume flow G01F 25/0007))