## CPC - COOPERATIVE PATENT CLASSIFICATION

### G PHYSICS

**(NOTES omitted)**

#### INSTRUMENTS

**G01** MEASURING (counting G06M); TESTING

**(NOTES omitted)**

**G01M TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING STRUCTURES OR APPARATUS NOT OTHERWISE PROVIDED FOR**

{{(devices for testing the performance of portable percussive tools with fluid-pressure drive B25D 9/005)}}

### NOTE

Attention is drawn to the Note following the title of Class G01.

### WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - G01M 1/38 covered by G01M 1/14 and G01M 1/30 and subgroups
2. 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 Testing static or dynamic balance of machines or structures

- **1/00** (balancing rotary bowls of centrifuges B04B 9/14; apparatus characterised by the means for holding wheels or parts thereof B60B 30/00; determining the stability factors of ships B63B; stabilising of aircraft B64C 17/00; control systems for balancing automatically in operation G05; balancing rotors of dynamo-electric machines H02K 15/16)

- **1/02** Details of balancing machines or devices
- **1/04** . . Adaptation of bearing support assemblies for receiving the body to be tested (tyre chucks in general G01M 17/021)
- **1/045** . . {the body being a vehicle wheel}
- **1/06** . . Adaptation of drive assemblies for receiving the body to be tested
- **1/08** . . Instruments for indicating directly the magnitude and phase of the unbalance (measuring electrical variables in general G01R)
- **1/10** . Determining the moment of inertia
- **1/12** . Static balancing; Determining position of centre of gravity (by determining unbalance G01M 1/14)
- **1/122** . . {Determining position of centre of gravity}
- **1/125** . . {of aircraft}
- **1/127** . . {during the flight}
- **1/14** . Determining unbalance (G01M 1/30 takes precedence)
- **1/16** . . by oscillating or rotating the body to be tested
- **1/18** . . . running the body down from a speed greater than normal
- **1/20** . . . and applying external forces compensating forces due to unbalance
- **1/22** . . . and converting vibrations due to unbalance into electric variables (measuring vibrations in general G01H; microphones or like acoustic electromechanical transducers H04R)

- **1/225** . . . {for vehicle wheels (in situ G01M 1/28)}
- **1/24** . . . Performing balancing on elastic shafts, e.g. for crankshafts
- **1/26** . . . with special adaptations for marking, e.g. by drilling
- **1/28** . . . with special adaptations for determining unbalance of the body in situ, e.g. of vehicle wheels

- **1/30** . Compensating unbalance (G01M1/38 takes precedence; counterweights F16F 15/28)
- **1/32** . . by adding material to the body to be tested, e.g. by correcting-weights (correcting-weights per se F16F 15/32)

- **1/323** . . {using balancing liquid}
- **1/326** . . . {the body being a vehicle wheel}
- **1/34** . . by removing material from the body to be tested, e.g. from the tread of tyres
- **1/36** . . by adjusting position of masses built-in the body to be tested
- **1/365** . . . {using balancing liquid}

- **3/00** Investigating fluid-tightness of structures
  - **3/00** (investigating permeability of porous material, investigating the presence of flaws in general G01N; membrane leak detection in blood dialysis A61M 1/1692; detecting infusion flow leakage A61M 5/16831)

- **3/002** . {by using thermal means}
- **3/005** . {using pigs or moles (G01M 3/246, G01M 3/2823 take precedence)}
- **3/007** . {Leak detector calibration, standard leaks (G01M 3/207 takes precedence)}

- **3/02** . by using fluid or vacuum
by detecting the presence of fluid at the leakage point

G01M 3/26, G01M 3/24, G01M 3/045, G01M 3/20

by observing bubbles in a liquid pool

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for containers, e.g. radiators

for flexible or elastic containers

for radiators

by observing elastic covers or coatings, e.g. soapy water

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for valves }
{ for welds }
{ for containers, e.g. radiators }
{ for flexible or elastic containers }
{ for radiators }

by observing elastic covers or coatings, e.g. soapy water

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

for flexible or elastic containers

for radiators

using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence (G01M 3/045 takes precedence))

by means of cables or similar elongated devices, e.g. tapes (construction of cables in general H01B)

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for containers, e.g. radiators

for flexible or elastic containers

{ for radiators }

using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence (G01M 3/045 takes precedence))

by means of cables or similar elongated devices, e.g. tapes (construction of cables in general H01B)

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for containers, e.g. radiators

for flexible or elastic containers

{ for radiators }

using special tracer materials, e.g. dye, fluorescent material, radioactive material

mass spectrometer detection systems (mass spectrometers H01J 49/26)

by measuring rate of loss or gain of fluid, e.g. by pressure-responsive devices, by flow detectors

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence (G01M 3/045 takes precedence))

using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence (G01M 3/045 takes precedence))

by observing elastic covers or coatings, e.g. soapy water

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for containers, e.g. radiators

for flexible or elastic containers

{ for radiators }

using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence (G01M 3/045 takes precedence))

by means of cables or similar elongated devices, e.g. tapes (construction of cables in general H01B)

for pipes, cables or tubes; for pipe joints or seals; for valves; for welds; for containers, e.g. radiators

{ for cables }
{ for tubes }
{ for (pipe joints or seals) }
{ for valves }
{ for welds }

for containers, e.g. radiators

for flexible or elastic containers

{ for radiators }

using special tracer materials, e.g. dye, fluorescent material, radioactive material

mass spectrometer detection systems (mass spectrometers H01J 49/26)
Investigating the elasticity of structures, e.g. deflection of bridges, air-craft wings (G01M 9/00 takes precedence; strain gauges G01B)

Vibration-testing of structures; Shock-testing of structures (G01M 9/00 takes precedence; generating vibrations B06, G10, H04R; vibration measurement G01H; material testing G01N 5/0058 takes precedence)

Vibration-testing (by means of a shake table)

Monodirectional test stands

Multidirectional test stands

Aerodynamic testing; Arrangements in or on wind tunnels (building aspects Section E; investigating properties of materials in general G01N)

Wind tunnels

Details

Measuring arrangements specially adapted for aerodynamic testing

Wind tunnel balances; Holding devices combined with measuring arrangements (measuring components of force in general G01L 5/16)

(dealing with flow (measuring volume flow G01F; measuring speed of fluids G01P 5/00))

[visualisation]

Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels (building aspects Section E; investigating properties of materials in general G01N; methods for designing, building, maintaining, converting, refitting, repairing or determining properties of vessels, not otherwise provided for and using towing tanks or model basins for designing B63B 9/02; for determining vessel properties with respect to stability or balance B63B 9/08; apparatus for indicating vessel attitude, e.g. inclination or duration of roll B63B 39/001)

Testing of optical apparatus; Testing structures by optical methods not otherwise provided for

Testing of reflective surfaces, e.g. mirrors

Testing of optical properties (of lenses)

Details of measuring devices

Details of devices holding the object to be tested

(by determining the optical axis or position of lenses)

(by measuring refractive power)

(by measuring multiple properties of lenses, automatic lens meters)

(by measuring geometrical properties or aberrations)

(by determining the shape of the object to be tested (measuring contours or curvatures by optical means G01B 11/24))

(by analyzing the image formed by the object to be tested)

(by using targets or reference patterns)

(by using interferometric methods)

(by measuring the optical modulation transfer function (photometry G01I))

(by using an indicator mounted on the head-light)

(by using camera or other imaging system for the light analysis)

(by using an optical fiber in contact with the light analysis)

(by determining the shape of the object to be tested, e.g. scratches or dust (investigating the presence of flaws or contamination on materials by optical means G01N 21/88))
11/086 . . . [Details about the embedment of the optical fiber within the DUT]

11/088 . . . [of optical fibres; Mechanical features associated with the optical testing of optical fibres (material testing in general G01N)]

11/30 . . . [Testing of optical devices, constituted by fibre optics or optical waveguides (measuring a given physical parameter of optical fibres, see the relevant subclasses, e.g. G01B, G01N; equipment for monitoring, testing or fault measuring in optical transmission systems H04B 10/07)]

11/31 . . . [with a light emitter and a light receiver being disposed at the same side of a fibre or waveguide end-face, e.g. reflectometers]

11/3109 . . . [Reflectometers detecting the back-scattered light in the time-domain, e.g. OTDR]

11/3118 . . . [using coded light-pulse sequences]

11/3127 . . . [using multiple or wavelength variable input source]

11/3136 . . . [for testing of multiple fibers]

11/3145 . . . [Details of the optoelectronics or data analysis]

11/3154 . . . [Details of the opto-mechanical connection, e.g. connector or repeater]

11/3163 . . . [by measuring dispersion]

11/3172 . . . [Reflectometers detecting the back-scattered light in the frequency-domain, e.g. OFDR, FMCW, heterodyne detection]

11/3181 . . . [Reflectometers dealing with polarisation]

11/319 . . . [Reflectometers using stimulated back-scatter, e.g. Raman or fibre amplifiers]

11/33 . . . [with a light emitter being disposed at one fibre or waveguide end-face, and a light receiver at the other end-face]

11/331 . . . [by using interferometer]

11/332 . . . [using discrete input signals (G01M 11/33 takes precedence)]

11/333 . . . [using modulated input signals]

11/334 . . . [with light chopping means]

11/335 . . . [using two or more input wavelengths]

11/336 . . . [by measuring polarization mode dispersion (PMD)]

11/337 . . . [by measuring polarization dependent loss (PDL)]

11/338 . . . [by measuring dispersion other than PMD, e.g. chromatic dispersion]

11/35 . . . [in which light is transversely coupled into or out of the fibre or waveguide, e.g. using integrating spheres (G01M 11/31 takes precedence)]

11/37 . . . [in which light is projected perpendicularly to the axis of the fibre or waveguide for monitoring a section thereof]

11/39 . . . [in which light is projected from both sides of the fiber or waveguide end-face]

13/00 Testing of machine parts (investigating the cutting power of tools, G01N, e.g. G01N 3/58)

13/005 . . . [Testing of sealing rings]

13/02 . . . Testing of gearing or of transmission mechanisms (measuring efficiency G01L)

13/021 . . . [of gearings]

13/022 . . . [of power-transmitting couplings or clutches]

13/023 . . . [of power-transmitting endless elements, e.g. belts, chains]

13/025 . . . [Test-benches using a rotational drive and loading means; Load/drive simulation]

13/026 . . . [of the mechanical closed-loop type]

13/027 . . . [Test-benches using force applying means, e.g. loading of drive shafts along several directions]

13/028 . . . [Acoustic or vibration analysis]

13/04 . . . Testing of bearings

13/045 . . . [by acoustic or vibration analysis]

15/00 Testing of engines

NOTE

Informative note

References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:

Measurement of mechanical vibrations in general G01H

Analysing gases in general G01N

Arrangements for testing electrical properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere G01R 31/00.

15/02 . . . Details or accessories of testing apparatus

15/04 . . . Testing of internal-combustion engines, e.g. diagnostic testing of piston engines

NOTES

1. Informative note

References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:

Monitoring or diagnostic devices for exhaust-gas treatment apparatus F01N 11/00

Indicating or supervising devices of internal-combustion engines F02B 77/08

Running in of internal-combustion engines F02B 79/00

Controlling combustion engines F02D

Apparatus for testing, tuning or synchronising carburettors, e.g. carburettor flow stands F02M 19/01

Testing fuel-injection apparatus F02M 65/00

Testing internal-combustion engine ignition, e.g. timing F02P 17/00

Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of torque and revolutions per unit of time, by multiplying the values of tractive or propulsive force and velocity G01L 3/24

Determining the characteristic of torque in relation to revolutions per unit of time G01L 5/26

Devices for detecting or indicating knocks in internal-combustion engines G01L 23/22

Devices for measuring pressure in inlet or exhaust ducts of internal combustion engines G01L 23/24
Means for indicating positions of pistons or cranks of internal-combustion engines by measuring pressure \( \text{G01L 23/30} \)

2. Group \( \text{G01M 15/05} \) takes precedence over groups \( \text{G01M 15/04} \) and \( \text{G01M 15/06 - G01M 15/12} \).

\( \text{15/042 . . .} \) \{by monitoring a single specific parameter not covered by groups \( \text{G01M 15/06 - G01M 15/12} \)\}

\( \text{15/044 . . .} \) \{by monitoring power, e.g. by operating the engine with one of the ignitions interrupted; by using acceleration tests\}

\( \text{15/046 . . .} \) \{by monitoring revolutions (for detecting misfire \( \text{G01M 15/11} \))\}

\( \text{15/048 . . .} \) \{by monitoring temperature\}

\( \text{15/05 . . . by combined monitoring of two or more different engine parameters} \)

\( \text{15/06 . . . by monitoring positions of pistons or cranks} \)

\( \text{15/08 . . . by monitoring pressure in cylinders} \)

\( \text{15/09 . . . by monitoring pressure in fluid ducts, e.g. in lubrication or cooling parts} \)

\( \text{15/10 . . . by monitoring exhaust gases (or combustion flame (analyses of gases per se \( \text{G01N} \)))} \)

\( \text{15/102 . . .} \) \{by monitoring exhaust gases\}

\( \text{15/104 . . .} \) \{using oxygen or lambda-sensors (testing catalytic converters \( \text{F01N 3/18, F01N 11/007} \))\}

\( \text{15/106 . . .} \) \{using pressure sensors\}

\( \text{15/108 . . .} \) \{using optical methods\}

\( \text{15/11 . . . by detecting misfire} \)

\( \text{15/12 . . . by monitoring vibrations} \)

\( \text{15/14 . . . Testing of gas-turbine plants or jet-propulsion plants} \)

**NOTE**

Informative note

References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:

Rocket-engine plants characterised by specially adapted arrangements for testing or measuring \( \text{F02K 9/96} \).

\( \text{17/00} \) \( \text{Testing of vehicles} \ (\text{G01M 15/00} \) takes precedence; testing fluid tightness \( \text{G01M 3/00} \); testing elastic properties of bodies or chassis, e.g. torsion testing \( \text{G01M 5/00} \); testing alignment of vehicle head-lighting devices \( \text{G01M 11/06} \); testing brakes \( \text{G01L 5/28} \); \)

\( \text{17/007 . . . of wheeled or endless-tracked vehicles} \ (\text{G01M 17/08 takes precedence}) \)

\( \text{17/0072 . . .} \) \{the wheels of the vehicle co-operating with rotatable rolls \( \text{(G01M 17/022, G01M 17/045, G01M 17/065 take precedence}) \)

\( \text{17/0074 . . .} \) \{Details, e.g. roller construction, vehicle restraining devices\}

\( \text{17/0076 . . .} \) \{for two-wheeled vehicles\}

\( \text{17/0078 . . .} \) \{Shock-testing of vehicles (shock-testing of structures in general \( \text{G01M 7/08, G01N 3/30}) \)

\( \text{17/013 . . . of wheels} \)

\( \text{17/02 . . . of tyres} \)

\( \text{17/021 . . .} \) \{Tyre supporting devices, e.g. chucks (for balancing \( \text{G01M 1/04}) \)

\( \text{17/022 . . .} \) \{the tyre co-operates with rotatable rolls\}