

G01C

MEASURING DISTANCES, LEVELS OR BEARINGS; SURVEYING; NAVIGATION; GYROSCOPIC INSTRUMENTS; PHOTOGRAMMETRY OR VIDEOGRAMMETRY (measuring liquid level [G01F](#); radio navigation, determining distance or velocity by use of propagation effects, e.g. Doppler effects, propagation time, of radio waves, analogous arrangements using other waves [G01S](#))

Definition statement

This place covers:

Devices, systems and methods for measuring distances, levels or bearings, for surveying, for photogrammetry or videogrammetry, for navigation; Gyroscopes and other turn-sensitive devices used as sensors. The subclass coverage includes:

- Compasses in general;
- Gyroscopes and other turn-sensitive devices used as sensors, e.g. optical gyrometers using the Sagnac effect;
- Optical rangefinders;
- Instruments, systems and methods for tracing profiles, for photogrammetry, for surveying, for nautical, aeronautical, cosmonautical, or geodetical measuring of distances, levels, heights, angles, inclinations and bearings, for land, sea, air or cosmonautical navigation, for measuring two or more variables of movement, e.g. distance, speed, acceleration;
- Manufacturing, calibrating, maintaining the previously listed elements.

Relationships with other classification places

The general subject matters of determining length, distance, height, level, direction, movement or angle is covered by several subclasses besides [G01C](#):

- [G01B](#) measuring length, thickness, or similar linear dimensions, measuring angles; measuring areas; measuring irregularities of surfaces or contours (of individual objects)
- [G01P](#) measuring linear or angular speed, acceleration, deceleration, or shock; indicating presence, absence, or direction, of movement
- [G01S](#) radio direction finding; radio navigation; determining distance or velocity by use of radio waves; locating or presence detecting by use of the reflection or reradiation of radio waves; analogous arrangements using other waves (by use of propagation effects - e.g. Doppler effect, propagation time -)
- When propagation effects of waves are relevant for such measurements [G01S](#) is in general the appropriate subclass.

For measuring ground distance between points in geodesy, surveying, and navigation or for measuring distance traversed on the ground by any moving objects including e. g. vehicles, or persons [G01C](#) is the appropriate subclass when no radio waves are used or when propagation effects of waves other than radio waves are not relevant.

References

Limiting references

This place does not cover:

Measuring liquid level	G01F
analogous arrangements using other waves	G01S

Informative references

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

Arrangements of nautical instruments or navigational aids for ships	B63B 49/00
Marking of navigation routes for ships other than with buoys	B63B 51/00
Arrangements or adaptations of instruments for aircrafts	B64D 43/00
Aiming means with range finders	F41G 3/00
Measuring acceleration, deceleration, shock by making use of gyroscopes	G01P 15/14
Arrangements or instruments for measuring magnetic variables (Measuring intensity or direction of magnetic fields, other than the earth's field, in general)	G01R 33/00
Measuring magnetic field characteristics of the earth, e.g. declination, deviation for purposes other than navigation, surveying	G01V 3/00
Rangefinders coupled with focussing arrangements of cameras	G03B 13/20
Stereoscopic photography	G03B 35/00
Photographing extended surfaces, e.g. Surveying cameras	G03B 37/00
Taximeter	G07B 13/00
Registering or indicating the working of vehicles	G07C 5/00
Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	G08G 1/0968
Maps, globes	G09B
Models or demonstration devices for surveying	G09B 25/06

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Navigation	means determining the position and course of humans, land vehicles, ships, aircraft, and space vehicles
Propagation effects	are relevant if the outcome of a measurement depends on the actual value of a physical quantity characterising the propagation of the wave, i.e. its wavelength, frequency, velocity, or phase. The mere presence or direction of a wave are not considered a propagation effect or to contribute to a propagation effect. To put it in another way, propagation effects are irrelevant, if the radiation may be looked upon as a beam of radiation whose wave nature can be ignored. Examples of measurements where propagation effects are relevant include e.g. measurements of propagation time, phase difference, phase delay, measurements using the Doppler effect, or interference.

G01C 1/00**Measuring angles****Definition statement**

This place covers:

Methods and devices for measuring angles using theodolites and sextants, for surveying or navigation

References**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Measuring angles in compasses	G01C 17/00
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G01C 1/02**Theodolites****References****Informative references**

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

Imaging systems using optical elements for stabilisation of the lateral and angular position of the image, compensating for small deviations, e.g. due to vibration or shake, for automatically maintaining a reference alignment, e.g. in self-levelling surveying instruments	G02B 27/648
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Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Transit	Theodolite which has a telescope which can be rotated 180 degrees around the horizontal (trunnion) axis
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G01C 1/06**Arrangements for reading scales****References****Informative references**

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

Arrangements for reading scales in general	G01D
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G01C 1/10

including an artificial horizon ([G01C 1/14](#) takes precedence)

References**Limiting references**

This place does not cover:

Periscopic sextants	G01C 1/14
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Informative references

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

Artificial horizons per se	G01C 15/14
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G01C 1/12

with a stabilised mirror

References**Informative references**

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

Tilt compensation in general	G12B 5/00
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G01C 1/14

Periscopic sextants

References**Informative references**

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

Periscopes in general	G02B 23/08
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G01C 3/00

Measuring distances in line of sight; Optical rangefinders (tapes, chains or wheels for measuring length [G01B 3/00](#); active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, [G01S 17/48](#))

Definition statement

This place covers:

Devices and methods for measuring distances in line of sight and optical rangefinders.

References

Limiting references

This place does not cover:

Tapes, chains or wheels for measuring length	G01B 3/00
Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	G01S 17/48

Informative references

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

Inter car distance or car rail distance	G01C 3/22
Anti-slumber devices for car drivers	B60K
Systems determining position data of a target using the reflection of electromagnetic waves other than radio waves for measuring distance only	G01S 17/08
Pulsed systems	G01S 17/10
Measuring distances using phase differences	G01S 17/36
Range finding by comparing magnitude of image of object to fiducial mark	G02B 27/32
Coupling rangefinders with operating parts of photographic apparatus	G03B

G01C 3/04

Adaptation of rangefinders for combination with telescopes or binoculars

References

Informative references

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

Rangefinders coupled with focussing arrangements of cameras	G03B 13/20
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G01C 3/085

{with electronic parallax measurement}

References

Informative references

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

Scene trackers using image correlation	G01S 3/7865
Ranging using stereo images	G01S 11/12

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Parallax	the angle subtended at an observation point by the two ends of a line section
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G01C 3/10

using a parallax triangle with variable angles and a base of fixed length in the observation station, e.g. in the instrument

References**Informative references**

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

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	G01S 17/48
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G01C 3/22

using a parallax triangle with variable angles and a base of fixed length at, near, or formed by the object

References**Informative references**

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

Optical viewing arrangements for vehicles	B60R 1/00
Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	G01S 17/48

G01C 3/24

using a parallax triangle with fixed angles and a base of variable length in the observation station, e.g. in the instrument

References**Informative references**

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

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	G01S 17/48
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G01C 3/26

using a parallax triangle with fixed angles and a base of variable length, at, near, or formed by the object

References**Informative references**

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

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	G01S 17/48
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G01C 5/00

Measuring height; Measuring distances transverse to line of sight; Levelling between separated points; Surveyors' levels ([G01C 3/20](#), [G01C 3/30](#) take precedence)

Definition statement

This place covers:

Methods and devices for measuring height, measuring distances transverse to line of sight, levelling between separated points and surveyor's levels for navigational or surveying purposes

References**Limiting references**

This place does not cover:

Measuring of distances to an object using a parallactic triangle with variable angles and a base of fixed length in the observation station, with adaptation to the measurement of the height of an object	G01C 3/20
Measuring of distances to an object using a parallactic triangle with fixed angles and a base of variable length at or near the object, with adaptation to the measurement of the height of an object, e.g. tacheometers	G01C 3/30

Informative references

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

Tracing profiles	G01C 7/00
Levels indicating inclination at a single point	G01C 9/00

G01C 5/005

{altimeters for aircraft ([G01C 5/02](#), [G01C 5/06](#) take precedence)}

References**Limiting references**

This place does not cover:

involving automatic stabilisation of the line of sight	G01C 5/02
by using barometric means	G01C 5/06

Informative references

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

Ground Proximity Warning Systems	B64D 45/04
Devices characterised by the determination of the variation of atmospheric pressure with height to measure the vertical components of speed (variometer)	G01P 3/62

G01C 5/02**involving automatic stabilisation of the line of sight****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Regulation of direction in general	G05D 3/00
Tilt compensation in general	G12B 5/00

G01C 5/06**by using barometric means****Definition statement***This place covers:*

Methods and devices for measuring height or distances transverse to line of sight, levelling between separated points and surveyors' levels using barometric means, e.g. depth gauges for divers of e.g. the wrist-watch type.

References**Application-oriented references***Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Mechanical watches with attached measuring instruments, e.g. pedometer	G04B 47/06
Electronic time-pieces with integrated detectors of external physical values	G04G 21/02

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

Divers' equipment in general	B63C 11/00
Barometers per se	G01L

G01C 7/00**Tracing profiles (by photogrammetry or videogrammetry [G01C 11/00](#))****Definition statement***This place covers:*

Devices and methods for tracing profiles of large surfaces such as land surfaces or underground surfaces.

References

Limiting references

This place does not cover:

Tracing profiles using photogrammetry or videogrammetry	G01C 11/00
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Informative references

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

Measuring irregularity or unevenness of surfaces on a small scale	G01B
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G01C 7/02

of land surfaces

References

Informative references

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

Checking of the level of roads	E01C 23/01
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G01C 7/06

of cavities, e.g. tunnels

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Survey of wells	E21B 47/00
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Informative references

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

Measuring apparatus or devices for track building purposes	E01B 35/00
Arrangement of measuring or indicating devices for use during driving of tunnels, using light beams for direction or position control	E21D 9/004

G01C 9/00

Measuring inclination, e.g. by clinometers, by levels

References

Informative references

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

Spirit levels combined with laser plumbing or levelling	G01C 15/008
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Devices for positioning picture hooks on a wall	A47G 1/205
Circuits for registering vehicle tilting or roll over	B60R 16/0233
Inclinometers for ladders	E06C 7/003
Switches operated by inclination or orientation	H01H 35/02

G01C 9/10

by using rolling bodies {, e.g. spheres, cylinders, mercury droplets}

Definition statement

This place covers:

Devices and methods for measuring inclination by using rolling bodies, also including sliding bodies.

References

Informative references

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

Spirit levels combined with laser plumbing or levelling	G01C 15/008
Devices for positioning picture hooks on a wall	A47G 1/205
Circuits for registering vehicle tilting or roll over	B60R 16/0233
Tell tale tilt indicators for proving inversion of goods during transport	B65D 79/02
Inclinometers for ladders	E06C 7/003
Tilting mercury container switches	H01H 29/20

G01C 9/12

by using a single pendulum (plumb lines [G01C 15/10](#))

References

Limiting references

This place does not cover:

Plumb lines	G01C 15/10
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Informative references

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

Vehicle anti theft means	B60R 25/1006
Tell tale tilt indicators for proving inversion of goods during transport	B65D 79/02

G01C 9/20

the indication being based on the inclination of the surface of a liquid relative to its container

References**Informative references**

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

Liquid level measurements	G01F 23/00
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G01C 9/28**Mountings****References****Informative references**

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

Inclinometers mounted to golf clubs for driving or putting	A63B 69/3632 , A63B 69/3685
Guiding hand tools by means of levels	B25H 1/0085

G01C 9/32

Means for facilitating the observation of the position of the bubble, e.g. illuminating means

Definition statement

This place covers:

Means for facilitating the observation of the position of the bubble by human observers.

References**Informative references**

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

Inclinometers mounted to golf clubs for driving or putting	A63B 69/3632 , A63B 69/3685
Guiding hand tools by means of levels	B25H 1/0085

G01C 11/00

Photogrammetry or videogrammetry, e.g. stereogrammetry; Photographic surveying

Definition statement

This place covers:

Methods and devices for photogrammetry or videogrammetry and photographic surveying

References

Informative references

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

Cameras combined with surveying instruments	G01C 1/00 , G01C 3/00 , G01C 5/00 , G01C 9/00
Earth observation satellites	B64G 1/1021
SAR imaging	G01S 13/90
Photographic aspects also	G03B 35/00 , G03B 15/00
Surveying cameras	G03B 37/00
Depth or shape recovery using image analysis	G06T 7/50
3D Geographic Models	G06T 17/05
Image or video recognition or understanding of scenes	G06V 20/00

G01C 11/02

Picture taking arrangements specially adapted for photogrammetry or photographic surveying, e.g. controlling overlapping of pictures

Definition statement

This place covers:

Special picture taking arrangements adapted to methods and devices for photogrammetry or videogrammetry and photographic surveying, including orthorectification.

G01C 11/04

Interpretation of pictures

Definition statement

This place covers:

Subject-matter related to the interpretation of pictures in methods and devices for photogrammetry or videogrammetry and photographic surveying, including means for interpretation, such as mensuration tables or reseaux.

G01C 11/06

by comparison of two or more pictures of the same area

Definition statement

This place covers:

Subject-matter related to the interpretation of pictures by comparison of two or more pictures of the same area in methods and devices for photogrammetry or videogrammetry and photographic surveying, e.g. stereo-photogrammetry

References

Informative references

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

Ranging using stereo images	G01S 11/12
Depth from stereo vision	G06T 7/593

G01C 13/00

Surveying specially adapted to open water, e.g. sea, lake, river or canal (liquid level metering [G01F](#))

Definition statement

This place covers:

All kinds of surveying instruments or accessories which are not provided for in the preceding groups [G01C 1/00](#) - [G01C 13/00](#).

References

Limiting references

This place does not cover:

Liquid level metering	G01F
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Informative references

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

Buoys	B63B 22/00
Oceanography	B63B 2211/02
Measuring liquid velocity	G01P
Determining existence of flow of underground water	G01V 9/02

G01C 13/008

{measuring depth of open water}

Definition statement

This place covers:

Measuring the distance between the water surface and the water bed.

References

Limiting references

This place does not cover:

Measuring instantaneous depth of diver	G01C 5/06
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Informative references

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

Buoys	B63B 22/00
Oceanography	B63B 2211/02

G01C 15/00**Surveying instruments or accessories not provided for in groups**

[G01C 1/00](#) - [G01C 13/00](#)

Definition statement

This place covers:

All kinds of surveying instruments or accessories which are not provided for in the preceding groups

[G01C 1/00](#) - [G01C 13/00](#).

References**Informative references**

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

Marking of work pieces	B25H 7/00
Surveying of railway tracks	E01B 35/00
Paving machines	E01C 19/00
Guiding the machines along a predetermined path	E01C 19/004
By laser or ultrasound	E01C 19/006
By reference lines placed along the road, e.g. wires	E01C 19/008
Finishing floors or ceilings	E04F 15/00 , E04F 21/00
Holders for bricklayers' lines	E04G 21/1808
Tripods	F16M 11/32
Models for surveying	G09B 25/06

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Optical plumbing	determining the vertical (plumb) using optical means
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G01C 15/002

{Active optical surveying means (optical plumbing [G01C 15/105](#))}

References**Limiting references**

This place does not cover:

Optical plumbing	G01C 15/105
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Informative references

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

Marking of work pieces	B25H 7/00
Surveying of railway tracks	E01B 35/00
Paving machines	E01C 19/00
Guiding the machines along a predetermined path	E01C 19/004
By laser or ultrasound	E01C 19/006
By reference lines placed along the road, e.g. wires	E01C 19/008
Finishing floors or ceilings	E04F 15/00 , E04F 21/00
Holders for bricklayers' lines	E04G 21/1808
Tripods	F16M 11/32
Models for surveying	G09B 25/06

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Active optical surveying means	surveying means using at least one propagation property of at least one light source
Total stations	theodolites with an electronic distance measuring capability, usually in the form of a laser ranging device

G01C 15/004**{Reference lines, planes or sectors}****Definition statement**

This place covers:

Generating a reference line, plane or sector by active optical means.

Measuring or comparing shortest distance (i.e. along the perpendicular) to the reference line, plane or sector.

References**Informative references**

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

Earth moving equipment using laser planes	E02F 3/847
Beam shaping	G02B 27/09
Self levelling surveying instruments	G02B 27/648

G01C 15/008

{combined with inclination sensor}

Relationships with other classification places

[G01C 15/008](#) covers surveying means whereby the inclination sensors are intended to be used as such; Surveying means having inclination sensors inside, merely to define the inclination of the reference plane, are covered by [G01C 15/004](#).

G01C 15/02

Means for marking measuring points

References

Informative references

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

Devices for positioning picture hooks on a wall	A47G 1/205
Means for marking work	B25H 7/04
Markings on roads, e.g. paint	E01C 23/16
Bollards	E01F 9/60 , E01F 15/0469
Transponders for markers	G06K 7/08 , G01S 13/02 , G08B 13/24

G01C 15/06

Surveyors' staffs; Movable markers

Definition statement

This place covers:

Surveyor's staffs or movable markers as means for marking measuring points in surveying methods.

References

Informative references

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

Tripods	F16M 11/32
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G01C 15/10

Plumb lines

References

Informative references

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

Chalk lines also	B44D 3/38
Cable pay-out	B65H 75/44

G01C 15/105**{Optical plumbing}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Chalk lines also	B44D 3/38
Cable pay-out	B65H 75/44

G01C 15/14**Artificial horizons****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Tilt compensation in general	G12B 5/00
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G01C 17/00**Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes (using gyroscopic effect [G01C 19/00](#))****Definition statement***This place covers:*

Compasses and devices for ascertaining true or magnetic North for the purpose of navigation or surveying, including magnetic compasses, sun and astro compasses, methods and arrangements for testing, calibrating or compensating of such compasses and devices and repeaters for remote indication of readings of a master compass.

References**Limiting references***This place does not cover:*

Using gyroscopic effect, e.g. devices for finding North	G01C 19/00 , e.g. G01C 19/34 , G01C 19/36 , G01C 19/38
Devices for finding North using gyroscopic effect	G01C 19/34 , G01C 19/36 , G01C 19/38

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

For geophysical or prospecting purposes	G01V 3/00
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G01C 17/28

Electromagnetic compasses (with north seeking magnetic elements and having electric pick-offs [G01C 17/26](#))

References**Limiting references**

This place does not cover:

With north seeking magnetic elements and having electric pick-offs	G01C 17/26
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Informative references

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

HALL effect sensors	G01R 33/07
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G01C 17/30

Earth-inductor compasses

Definition statement

This place covers:

Fluxgates, these being instruments in which a core is saturated by the strong flux of an AC driving coil, the bias of the saturation being set by the earth's magnetic field.

Rotating induction coils.

References**Informative references**

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

Prayer rugs	A47G 27/0237 , A47G 33/00
HALL effect sensors	G01R 33/07

G01C 17/34

Sun- or astro-compasses

References**Informative references**

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

Time-pieces using the position of the sun, moon or stars	G04B 49/00
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G01C 19/00

Gyroscopes; Turn-sensitive devices using vibrating masses; Turn-sensitive devices without moving masses; Measuring angular rate using gyroscopic effects

Definition statement

This place covers:

Gyroscopic sensors, i.e gyroscopes, turn-sensitive devices with or without vibrating/moving masses that are intended for sensing and outputting inertial rotation angles, angular velocity or bearings.

Relationships with other classification places

Gyroscopes for sensing are covered here.

Gyroscopes, used as actuators for stabilisation or movement purposes by means of their angular momentum are not covered in [G01C 19/00](#) but in their particular fields, e.g:

- Land vehicle stabilisation using gyroscopes [B62D 37/06](#);
- Ship stabilisation using gyroscopes [B63B 39/04](#);
- Gyros used as motors or actuators [F03G 3/08](#);
- Educational demonstration models of gyroscopic actuators [G09B 23/00](#), [G09B 25/00](#);
- Control Moment Gyroscopes for space vehicles [B64G 1/28](#).

References

Informative references

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

Gimbals, not especially for gyroscopes	F16M 11/12
Educational demonstration models of gyroscopes	G09B 23/00 , G09B 25/00

G01C 19/025

{Gyroscopes functioning for short periods}

Definition statement

This place covers:

Details about particular arrangements for rotary gyroscopes functioning during a short period, e.g. in guided missiles, torpedoes, etc., wherein the gyro rotor must be brought up to operational speed in a very short time.

References

Informative references

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

Target seeking gyro	F41G 7/2213
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G01C 19/065**{Means for measuring or controlling of rotors' angular velocity}****Definition statement***This place covers:*

Details about particular devices or methods for measuring and/or controlling the angular speed of rotors of rotary gyroscopes for specific purposes.

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

Measuring angular speed in general	G01P
Controlling angular speed	G05D 13/00
Controlling electrical motors	H02P

G01C 19/08**electrically driven ([G01C 19/14](#) takes precedence)****References****Limiting references***This place does not cover:*

Fluid rotors	G01C 19/14
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Informative references*Attention is drawn to the following places, which may be of interest for search:*

Dynamoelectric machines	H02K
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G01C 19/16**Suspensions; Bearings****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Bearings in general	F16C
Balancing rotors	G01M

G01C 19/22**torsional****Definition statement**

This place covers:

Details about suspensions of elements of rotary gyroscopes, wherein the suspensions are of the torsional type.

References**Informative references**

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

Flexure pivots	F16C 11/12
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G01C 19/26**Caging, i.e. immobilising moving parts, e.g. for transport****References****Informative references**

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

Applicable to instruments in general	G01D 11/20
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G01C 19/30

Erection devices, i.e. devices for restoring rotor axis to a desired position (for instrument indicating the vertical [G01C 19/46](#))

References**Limiting references**

This place does not cover:

Erection devices for instruments indicating the vertical	G01C 19/46
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Synonyms and Keywords

In patent documents, the word/expression in the first column is often used instead of the word/expression in the second column, which is used in the classification scheme of this place:

Rebalance	Erection
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In patent documents, the following words/expressions are often used with the meaning indicated:

Torquer	Erection devices, i.e. devices for restoring rotor axis to a desired position
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G01C 19/32**Indicating or recording means specially adapted for rotary gyroscopes****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Indicating or recording measured values in general	G01D 7/00 , G01D 9/00
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G01C 19/36**with north-seeking action by magnetic means, e.g. gyromagnetic compasses****Synonyms and Keywords***In patent documents, the following words/expressions are often used as synonyms:*

- " Meridian- seeking ", and " north-seeking "

G01C 19/56**Turn-sensitive devices using vibrating masses, e.g. vibratory angular rate sensors based on Coriolis forces****Definition statement***This place covers:*

Turn-sensitive devices using one or more vibrating masses, e.g. vibrating gyros based on Coriolis forces, surface acoustic waves based gyros, sonic or acoustic gyros.

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

Microstructural devices or systems	B81B
Processes or apparatus specially adapted for the manufacture or treatment of microstructural devices or systems	B81C
Electromechanical resonators	H03H 9/00
Piezoelectric devices per se	H10N 30/00

G01C 19/5607**using vibrating tuning forks (double-ended tuning forks using planar vibrating masses suspended at opposite ends [G01C 19/5719](#))****References****Limiting references***This place does not cover:*

Double-ended tuning forks using planar vibrating masses suspended at opposite ends	G01C 19/5719
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G01C 19/5642**using vibrating bars or beams****Definition statement***This place covers:*

Turn-sensitive devices using one or more vibrating bars or beams undergoing deformations.

G01C 19/5677**of essentially two-dimensional vibrators, e.g. ring-shaped vibrators****Definition statement***This place covers:*

Vibrators having their main extension in a plane, i.e. with an essentially two-dimensional geometrical structure and using the phase shift of a vibration node or anti-node. The vibrations cover both deformations in the radial direction of the two-dimensional vibrator and deformations perpendicular to the plane of the two-dimensional vibrator.

G01C 19/5698**using acoustic waves, e.g. surface acoustic wave gyros****Definition statement***This place covers:*

Both bulk and surface acoustic wave gyros.

G01C 19/58**Turn-sensitive devices without moving masses****Definition statement***This place covers:*

All the turn-sensitive devices that do not operate on the basis of vibrating or deforming elements, e.g. gyroscopes using matter-wave interferometers.

G01C 19/60**Electronic or nuclear magnetic resonance gyrometers****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Magnetic resonance arrangements in general	G01R 33/20
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G01C 19/66**Ring laser gyrometers****References****Informative references**

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

Ring lasers in general	H01S 3/083
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G01C 19/662**{signal readout; dither compensators}****Definition statement**

This place covers:

Ring laser gyrometers having special arrangements for the signal readout or the dither compensation (dither compensators).

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Dither compensators	passive optical components placed on the body in a position where the dither signal is cancelled fortuitously
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G01C 19/664**{means for removing the dither signal}****Definition statement**

This place covers:

Electronic removal of the dither signal.

G01C 19/665**{control of the cavity }****Definition statement**

This place covers:

Ring laser gyrometers having special arrangements for controlling the cavity, e.g. by use of piezoelectric mirrors.

References**Informative references**

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

Lasers in general	H01S 3/10
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G01C 19/72

with counter-rotating light beams in a passive ring, e.g. fibre laser gyrometers

References**Informative references**

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

Interferometers per se	G01B 9/02
Faraday effect Sagnac interferometers for measuring electrical current	G01R 15/246
Fibre laser emission sources for gyros	H01S 3/06795
Brillouin lasers	H01S 3/30

G01C 19/721

{Details, e.g. optical or electronical details}

References**Informative references**

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

Fibre ring lasers	H01S 3/06791
Amplified spontaneous emission sources for fibre laser gyrometers	H01S 3/06795

G01C 19/722

{of the mechanical construction}

References**Informative references**

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

General winding techniques	B65H
Bobbin-type optical phase modulators	G02B 26/06
Winding of electrical cable	H02G

G01C 19/725

{using nxn optical couplers, e.g. 3x3 couplers}

References**Informative references**

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

Optical couplers	G02B 6/00
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G01C 19/727**{using a passive ring resonator}****Glossary of terms***In this place, the following terms or expressions are used with the meaning indicated:*

RFOG	Resonant Fibre Optical Gyroscope
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G01C 21/00

Navigation; Navigational instruments not provided for in groups [G01C 1/00](#) - [G01C 19/00](#) (measuring distance traversed on the ground by a vehicle [G01C 22/00](#); control of position, course, altitude or attitude of vehicles [G05D 1/00](#); traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle [G08G 1/0968](#))

Definition statement*This place covers:*

Navigation devices, systems and methods

References**Limiting references***This place does not cover:*

Measuring distance traversed on the ground by a vehicle	G01C 22/00
Control of position, course, altitude or attitude of vehicles	G05D 1/00
traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	G08G 1/0968

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

Measuring linear or angular speed or acceleration	G01P
Traffic control systems	G08G 1/00

G01C 21/005

{with correlation of navigation data from several sources, e.g. map or contour matching ([G01C 21/30](#) takes precedence)}

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

Combined GPS/INS	G01C 21/165
Segmentation of images	G06V 10/26

G01C 21/02

by astronomical means ([G01C 21/24](#), [G01C 21/26](#) take precedence)

References**Limiting references**

This place does not cover:

Specially adapted for cosmonautical navigation	G01C 21/24
Specially adapted for navigation in a road network	G01C 21/26

Informative references

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

Time-pieces using the position of the sun, moon or stars	G04B 49/00
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G01C 21/04

by terrestrial means ([G01C 21/24](#), [G01C 21/26](#) take precedence)

References**Limiting references**

This place does not cover:

Specially adapted for cosmonautical navigation	G01C 21/24
Specially adapted for navigation in a road network	G01C 21/26

Informative references

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

Marking of navigation route for ships	B63B 51/00
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G01C 21/10

by using measurements of speed or acceleration ([G01C 21/24](#), [G01C 21/26](#) take precedence)

References**Limiting references**

This place does not cover:

Specially adapted for cosmonautical navigation	G01C 21/24
Specially adapted for navigation in a road network	G01C 21/26

G01C 21/14

by recording the course traversed by the object ([G01C 21/16](#) takes precedence)

References**Limiting references**

This place does not cover:

By integrating acceleration or speed, i.e. inertial navigation	G01C 21/16
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G01C 21/16

by integrating acceleration or speed, i.e. inertial navigation

References**Informative references**

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

Vibration damping or isolation	F16F 15/08
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G01C 21/165

{combined with non-inertial navigation instruments}

References**Informative references**

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

Determining position by combining measurements of signals from the satellite radio beacon positioning system with an inertial measurement	G01S 19/47 , G01S 19/49
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G01C 21/18

Stabilised platforms, e.g. by gyroscope

References**Informative references**

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

Stabilisation of surveying instruments	G02B 27/648
Stabilisation of antennae	H01Q 1/18

G01C 21/20

Instruments for performing navigational calculations ([G01C 21/24](#), [G01C 21/26](#) take precedence)

References**Limiting references**

This place does not cover:

Specially adapted for cosmonautical navigation	G01C 21/24
Specially adapted for navigation in a road network	G01C 21/26

Informative references

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

Marking of navigation route for ships	B63B 51/00
Hand-held measuring wheels for measuring distances on maps	G01B 3/12
Digital data processing	G06F
Hand manipulated computing devices for air or sea navigation	G06G 1/0052
Emergency signalling and personal security systems	G08B 25/016

G01C 21/203

{specially adapted for water-borne vessels}

References**Informative references**

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

Control of position or course in two dimensions	G05D 1/43
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G01C 21/22

Plotting boards

References**Informative references**

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

Plotting boards in general	B43L
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G01C 21/26

specifically adapted for navigation in a road network

Definition statement

This place covers:

Navigation specifically adapted for navigation in a road network, whereby the means of transportation is not relevant: the user may be moving on foot, on horseback, on a bicycle, or in or on a motor vehicle of any kind.

References

Informative references

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

Precision agriculture	A01B 79/005
Navigation assistance for the blind or visually impaired	A61H 3/061
Display devices for vehicle air conditioning	B60H 1/00985
Speed or cruise control depending on curves	B60K 31/0066
Headlights adjustable depending on position, curves etc.	B60Q 1/06
Parking assistance	B60Q 1/48
Mechanical construction of the navigation device mounting in a vehicle	B60R 11/0258
Circuits for registering vehicle tilting or roll over	B60R 16/0233
Control of driving parameters	B60T 8/00 , B60K 28/10 , B62D 6/00
Adaptive cruise control	B60W 30/16
Estimation or calculation of driving parameters for road vehicle drive control systems related to road conditions	B60W 40/06
Lane keeping	B62D 1/28 , B60W 30/10
Gear shifting depending on position as determined by navigation system	F16H 61/0213
Hand-held measuring wheels for measuring distances on maps	G01B 3/12
Hand manipulated computing devices for air or sea navigation	G06G 1/0052
GIS Geographic 3D models	G06T 17/05
Taximeters	G07B 13/00
Toll collection	G07B 15/00
Service reminders	G07C 5/006 , B60R 16/0234
Data recorders	G07C 5/08
Emergency signalling and personal security systems	G08B 25/016
Traffic information including RDS/TMC	H04H 20/55 , G08G 1/091 , G08G 1/0968
Location based services in a mobile phone network	H04W 4/02
Locating mobile subscriber using cellular telephony	H04W 64/00

G01C 21/28**with correlation of data from several navigational instruments****Definition statement***This place covers:*

Whereby the several navigational instruments may be similar (simple redundancy) or dissimilar.

G01C 21/30**Map- or contour-matching****Synonyms and Keywords***In patent documents, the following words/expressions are often used as synonyms:*

- "Contours" and "elevation data/profile"

G01C 21/32**Structuring or formatting of map data****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Geographic Information Systems (GIS) databases	G06F 16/29
Automatic recognition/extraction of roads or features from maps	G06V 30/422

G01C 21/34**Route searching; Route guidance****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Optimisation of energy usage for electrical vehicles	B60L 15/2045
Optimisation of routes, e.g. travelling salesman problem	G06Q 10/047 , G06Q 10/109

G01C 21/3407**{specially adapted for specific applications}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Fleet management, taxi dispatching	G08G 1/202
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G01C 21/3415

{Dynamic re-routing, e.g. recalculating the route when the user deviates from calculated route or after detecting real-time traffic data or accidents}

Definition statement

This place covers:

The use of route searching in navigation devices, systems or methods for dynamic re-routing, including predictive systems in which alternative routes are calculated even before the user has actually deviated and also routing from a predicted future starting point.

References

Informative references

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

The complete route is dynamically recomputed based on new data	G08G 1/096844
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G01C 21/3423

{Multimodal routing}

Definition statement

This place covers:

Combining two or more modes of transportation, where the modes can be any of, e.g. driving, walking, cycling or public transport.

G01C 21/343

{Calculating itineraries (travelling salesman problem [G06Q 10/04](#); optimisation of routes [G06Q 10/047](#))}

Definition statement

This place covers:

Routes leading from a starting point to a series of categorical destinations using a global route restraint, round trips or touristic trips.

G01C 21/3438

{Rendezvous; Ride sharing}

Definition statement

This place covers:

- Searching a destination where several users can meet, and the routes to this destination for these users.
- Searching a route such that at least two users can share a vehicle for at least part of the route.

G01C 21/3461

{Preferred or disfavoured areas, e.g. dangerous zones, toll or emission zones, intersections, manoeuvre types or segments such as motorways, toll roads or ferries}

Definition statement

This place covers:

Areas disfavoured because of weather conditions, (dis)favouring certain roads because of curves, e.g. for motorcycle (favoured) or towing vehicle (disfavoured), or because of physical requirements (e.g., weight, length, height, width) of non-standard vehicles.

Carpooling/High Occupancy Vehicle restrictions.

Also taking into account whether the user is entitled to use a road or road type (Vignette).

G01C 21/3476

{using point of interest [POI] information, e.g. a route passing visible POIs}

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

POI	point of interest
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G01C 21/3484

{Personalized, e.g. from learned user behaviour or user-defined profiles}

References**Informative references**

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

User preferences are taken into account or the user selects one route out of a plurality	G08G 1/096838
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G01C 21/3492

{employing speed data or traffic data, e.g. real-time or historical (traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle [G08G 1/0968](#))}

Definition statement

This place covers:

Employing traffic data whereby those traffic data may relate either to the vehicle traffic of the physical vehicle or to the data traffic in mobile communication networks.

References

Informative references

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

Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	G08G 1/0968
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G01C 21/36

Input/output arrangements for on-board computers

References

Informative references

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

Instruments specially adapted for vehicles; Arrangement of instruments in or on vehicles	B60K 35/00
Instruments characterised by their location or relative disposition in or on vehicles	B60K 35/60
Mechanical construction of the display mounting in a vehicle	B60R 11/0235
Electric circuits for voice control	B60R 16/0373
Audible indication of meter readings	G01D 7/12
Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements	G06F 3/00
I/O for computers in general	G06F 3/033
Interaction techniques for graphical user interfaces, e.g. interaction with windows, icons or menus	G06F 3/048
Manipulating 3D models or images for computer graphics	G06T 19/00
Voice analysis, synthesis	G10L , G10L 15/26

G01C 21/3602

{Input other than that of destination using image analysis, e.g. detection of road signs, lanes, buildings, real preceding vehicles using a camera}

References

Informative references

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

Image data processing per se	G06T
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G01C 21/3605**{Destination input or retrieval}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Gesture based interaction between user and computer	G06F 3/017
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G01C 21/3608**{using speech input, e.g. using speech recognition}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Speech recognition	G10L 15/00
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G01C 21/3611**{using character input or menus, e.g. menus of POIs (character input methods in general [G06F 3/0233](#))}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Character input methods	G06F 3/0233
Input is assisted by the navigation device, i.e. the user does not type the complete name of the destination, e.g. using zip codes, telephone numbers, progressively selecting from initial letters	G08G 1/096894

G01C 21/3617**{using user history, behaviour, conditions or preferences, e.g. predicted or inferred from previous use or current movement}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Input information is obtained using learning systems, e.g. history databases	G08G 1/096888
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G01C 21/362

{received from an external device or application, e.g. PDA, mobile phone or calendar application}

Definition statement

This place covers:

Destinations derived from radio or TV broadcasts.

Destination being the (dynamic) position of a mobile device and received therefrom.

References**Informative references**

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

Input information is obtained using a mobile device, e.g. a mobile phone, a PDA	G08G 1/096883
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G01C 21/3626

{Details of the output of route guidance instructions (traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle [G08G 1/0968](#))}

Definition statement

This place covers:

Instructions to assist the user to follow the calculated route as well as to warn the user in order to prevent the user from leaving the calculated route.

References**Informative references**

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

Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	G08G 1/0968
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G01C 21/3629

{Guidance using speech or audio output, e.g. text-to-speech (text to speech systems per se [G10L 13/00](#))}

References**Informative references**

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

Instructions are given by voice	G08G 1/096872
Speech systems per se	G10L 13/00

G01C 21/3632

{Guidance using simplified or iconic instructions, e.g. using arrows
([G01C 21/365](#) takes precedence)}

Definition statement

This place covers:

Details on guidance in navigation devices, systems or methods, wherein the guidance uses simplified or iconic instructions, e.g. directional arrows or other symbols, textual instructions.

References

Limiting references

This place does not cover:

Guidance using head up displays or projectors, e.g. virtual vehicles or arrows projected on the windscreen or on the road itself	G01C 21/365
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Informative references

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

The immediate route instructions are output to the driver, e.g. arrow signs for next turn	G08G 1/096861
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G01C 21/3638

{including 3D objects and buildings (three dimensional [3D] modelling, e.g. data description of 3D objects [G06T 17/00](#); geographic models [G06T 17/05](#))}

References

Informative references

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

Three dimensional [3D] modelling, e.g. data description of 3D objects	G06T 17/00
Geographic models	G06T 17/05

G01C 21/3641

{Personalized guidance, e.g. limited guidance on previously travelled routes}

Definition statement

This place covers:

Details on guidance in navigation devices, systems or methods, wherein specific guidance adapted to the user is used, including user-defined guidance preferences relating to the manner of guidance, e.g. language, 2D/3D and guidance adapted to the instantaneous workload of the driver, considering also his mental and/or physical health.

G01C 21/3647**{Guidance involving output of stored or live camera images or video streams}****Definition statement***This place covers:*

Details on guidance in navigation devices, systems or methods, wherein the guidance involves camera images, including images taken by a camera in the vehicle itself, by a camera in another vehicle, by a roadside camera, or by a camera in an aircraft or in a satellite.

G01C 21/3658**{Lane guidance}****Definition statement***This place covers:*

Details on guidance in navigation devices, systems or methods, wherein the guidance takes road lanes into account, including showing a representation of an upcoming intersection including the pattern of the lanes.

G01C 21/3664**{Details of the user input interface, e.g. buttons, knobs or sliders, including those provided on a touch screen; remote controllers; input using gestures}****Definition statement***This place covers:*

Details on the user-input interface in navigation devices, systems or methods, including e.g. touch-screen interfaces, remote controllers, gesture-based input, interfaces which disallow the driver to access certain functions, e.g. while driving, input using handwriting.

References**Informative references**

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

Gesture based interaction	G06F 3/017
Interaction techniques for image manipulation, e.g. dragging, rotation	G06F 3/04845
Interaction techniques involving entering handwritten data on touch screens	G06F 3/04883

G01C 21/3667**{Display of a road map ([G01C 21/3614](#) takes precedence; guidance using 3D or perspective road maps [G01C 21/3635](#))}****Definition statement***This place covers:*

Input/output arrangements in navigation devices, systems or methods focusing on the display of a road map, including also simplified map representing connections between nodes.

References

Limiting references

This place does not cover:

Through interaction with a road map, e.g. selecting a POI icon on a road map	G01C 21/3614
Guidance using 3D or perspective road maps	G01C 21/3635

Informative references

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

Map spot or coordinate position indicators or map reading aids, using electronic means	G09B 29/106
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G01C 21/367

{Details, e.g. road map scale, orientation, zooming, illumination, level of detail, scrolling of road map or positioning of current position marker}

References

Informative references

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

Interaction techniques for image manipulation, e.g. dragging, rotation	G06F 3/04845
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G01C 21/3673

{Labelling using text of road map data items, e.g. road names, POI names}

Definition statement

This place covers:

Input/output arrangements in navigation devices, systems or methods focusing on the labelling using text on road map displays, including also the displaying of house numbers.

G01C 21/3676

{Overview of the route on the road map}

References

Informative references

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

The complete route is shown to the driver	G08G 1/096866
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G01C 21/3679

{Retrieval, searching and output of POI information, e.g. hotels, restaurants, shops, filling stations, parking facilities ([G01C 21/3611](#) takes precedence)}

References**Limiting references**

This place does not cover:

Using character input or menus, e.g. menus of POIs	G01C 21/3611
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Informative references

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

Location based services in a mobile phone network	H04W 4/02 , H04L 67/52 , H04M 3/42348
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G01C 21/3682

{output of POI information on a road map ([G01C 21/3614](#), [G01C 21/3685](#) take precedence)}

References**Limiting references**

This place does not cover:

Through interaction with a road map, e.g. selecting a POI icon on a road map	G01C 21/3614
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G01C 21/3688

{Systems comprising multiple parts or multiple output devices (not client-server), e.g. detachable faceplates, key fobs or multiple output screens}

Definition statement

This place covers:

Systems where multiple parts show a functional relationship (cooperation, synergy) between the part which remains in the vehicle and the portable part; this is different from the mechanical mounting of a mobile part to some part of a vehicle. The portable part must perform some navigation-related function on its own when taken out of the vehicle.

G01C 21/3691

{Retrieval, searching and output of information related to real-time traffic, weather, or environmental conditions (arrangements for giving variable traffic instructions [G08G 1/09](#))}

Definition statement

This place covers:

Input/output arrangements in navigation devices, systems or methods focusing on the processing of real-time traffic or weather information, including also traffic information sent from the vehicle to a server.

References

Informative references

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

Arrangements for giving variable traffic instructions	G08G 1/09
Arrangements for broadcast of traffic information	H04H 20/55

G01C 21/3697

{Output of additional, non-guidance related information, e.g. low fuel level ([G01C 21/3679](#) takes precedence)}

Definition statement

This place covers:

Output arrangements in navigation devices, systems or methods focusing on the output of specific information not related to guidance, e.g. low remaining fuel, fuel efficient driving, gear change, speeding, dangerous curve ahead, slippery road, traffic incident ahead, school zone, traffic cameras or road signs and including also advertisements displayed on maps or projected onto the landscape; providing information to the driver concerning his driving behaviour; warnings for speed traps.

References

Limiting references

This place does not cover:

Retrieval, searching and output of POI information	G01C 21/3679
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Informative references

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

Commerce, e.g. advertising	G06Q 30/02
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G01C 22/00

Measuring distance traversed on the ground by vehicles, persons, animals or other moving solid bodies, e.g. using odometers, using pedometers

Definition statement

This place covers:

Devices and methods for measuring distance traversed on the ground by vehicles, persons, animals or other moving solid bodies, e.g. using pedometers, odometers including mechanical odometers.

References**Informative references**

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

Golf carts	A63B 55/60
Tyres	B60C 23/00
Indicating or recording positions or identities of vehicles or vehicle trains	B61L 25/02
Hand-held measuring wheels for measuring distances on maps	G01B 3/12
Resetting mechanisms	G01D 4/04
Measuring tyre performance on wheel stands	G01M 17/00
Counting mechanisms per se	G06M
Anti tamper counters	G06M 3/12
Taximeters	G07B 13/00
Service reminders	G07C 5/006 , B60R 16/0234
Stepping motors	H02P 8/00

G01C 22/002

{for cycles}

Definition statement

This place covers:

The cycles can be monocytes, bicycles, tricycles or motorcycles.

G01C 22/004

{for golf carts }

References**Informative references**

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

Wheeled carriers for golf bags	A63B 55/60
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G01C 22/006**{Pedometers}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Footwear	A43B 3/00
Portable device for measuring pulse or heart rate	A61B 5/02438
Electronic controls for exercising apparatus	A63B 24/00
Detectors of external physical values for measuring physiological data	G04G 21/025

G01C 22/008**{for skates}****Definition statement***This place covers:*

Devices and methods for measuring distance traversed on the ground, specially adapted for skates, including roller skates, in-line skates, ice skates, and skis.

G01C 22/02

by conversion into electric waveforms and subsequent integration, e.g. using tachometer generator {([G01C 22/002](#), [G01C 22/004](#), [G01C 22/006](#) take precedence)}

Definition statement*This place covers:*

Odometers involving electrical or electronic components.

References**Limiting references***This place does not cover:*

For cycles	G01C 22/002
For golf carts	G01C 22/004
Pedometers	G01C 22/006
For skates	G01C 22/008

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

Wheel hubs	B60B 27/00
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G01C 22/025**{Differential odometers}****Definition statement**

This place covers:

Systems in which direction (orientation, azimuth) is determined by measuring the distances traversed by wheels on either side of the vehicle, and taking the difference of these distances.

G01C 23/00

Combined instruments indicating more than one navigational value, e.g. for aircraft; Combined measuring devices for measuring two or more variables of movement, e.g. distance, speed or acceleration

Definition statement

This place covers:

Devices, systems and methods for indicating more than one navigational value, e.g position and azimuth, devices, systems and methods for measuring two or more variables of movement, e.g. distance, speed and acceleration

References**Informative references**

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

Artificial horizons for aircraft	G01C 19/44 , G01C 19/32
Arrangements for passenger entertainment, including display of navigation data using TV screens	B64D 11/0015
Flight simulators	G09B 9/42

G01C 23/005

{Flight directors (indicating arrangements specially adapted for rotary gyroscopes [G01C 19/32](#))}

Definition statement

This place covers:

Flight directors, i.e. devices which provide visual steering cues to the pilot for e.g. pitch , roll, yaw attitude controls to allow a pilot to manipulate the aircraft controls in a manner to keep the steering cues aligned with corresponding fixed symbols, in order to satisfy the pitch and roll attitude control laws so that the aircraft is maintained on a predetermined flight path.

References**Limiting references**

This place does not cover:

Indicating arrangements specially adapted for rotary gyroscopes	G01C 19/32
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Informative references

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

Arrangements or adaptations of instruments for aircraft	B64D 43/00
Indicating or recording in connection with measuring, in general	G01D
Control of course of land or air vehicles by controlling or regulating non-electric variables	G05D 1/00
Navigation or guidance aids for a single aircraft	G08G 5/55
Anti-collision systems for aircraft	G08G 5/80

G01C 25/00

Manufacturing, calibrating, cleaning, or repairing instruments or devices referred to in the other groups of this subclass (testing, calibrating or compensating compasses [G01C 17/38](#))

Definition statement

This place covers:

Devices and methods for manufacturing, calibrating, cleaning or repairing instruments and devices referred to in the preceding groups.

References**Limiting references**

This place does not cover:

Testing, calibrating and compensating compasses	G01C 17/38
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