CPC COOPERATIVE PATENT CLASSIFICATION

G04F TIME-INTERVAL MEASURING (measuring pulse characteristics G01R , e.g. G01R 29/02; in radar or like systems G01S ; masers H01S 1/00; generation of oscillations H03B ; generation or counting of pulses, frequency dividing, analogue/digital conversion H03K) { time fuzes F42C 9/00 }

NOTE

This subclass covers:

- apparatus for measuring-off predetermined time intervals;
- apparatus for producing such intervals as timing standards, e.g. metronomes;
- apparatus for measuring unknown intervals, e.g. precision systems for short time interval measurement.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G04F 10/08 covered by G04F 5/16

Guidance heading:

G04F 1/00 **Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals without driving mechanisms, e.g. egg timer** (electric time and time-programme switches H01H 43/00)

G04F 1/005 . {using electronic timing, e.g. counting means (pulse time delay arrangements H03K 5/13; modifications of electronic switches for introducing a time delay before switching H03K 17/28) }

G04F 1/02 . by consuming prefixed quantities of materials, e.g. by burning candle

G04F 1/04 . by movement or acceleration due to gravity

G04F 1/06 . . by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock

G04F 1/063 . . . {using acoustic signalling }

G04F 1/066 . . . {using electrical contact device }

G04F 1/08 . . by a body falling a prefixed distance in air or in a viscous material

G04F 3/00 **Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with driving mechanisms, e.g. dosimeter with clockwork** (electric time or time-programme switches H01H 43/00)

G04F 3/02 . with mechanical driving mechanisms

G04F 3/022 . . {using mechanical signalling device }

G04F 3/025 . . {mechanically actuated (cigar or cigarette receptacles or boxes with means for limiting the frequency of smoking A24F 15/005) }

G04F 3/027 . . {using electrical contacts, e.g. for actuating electro-acoustic device }

G04F 3/04 . . Additional arrangements in connection with ordinary non-electric clocks for this purpose

G04F 3/06 . with electric driving mechanisms

G04F 3/08 . . Additional arrangements in connection with ordinary electric clocks for this purpose

G04F 5/00 **Apparatus for producing preselected time intervals for use as timing standards** (generating clock signals for electric digital computers G06F 1/04; regulating frequency in general H03C , H03L)

G04F 5/02 . Metronomes {periodic signalisation by acoustic signals in general G04B 21/005 }

G04F 5/022 . . {Mechanic metronomes }

G04F 5/025 . . { Electronic metronomes } {rhytem generation for electrophonic musical instruments G10H 1/36 }

G04F 5/027 . . {using electro-mechanical driving e.g. of optical scanned recordings (electrophonic musical instruments in which tones are generated by electromechanical means e.g. by using pick-up means for reading recorded waves G10H 3/00) }

G04F 5/04 . using oscillators with electromechanical resonators {producing electric oscillations or timing pulses }

G04F 5/06 . . using piezoelectric resonators

G04F 5/063 . . . {Constructional details } (details of resonators in general H03H 9/02)

G04F 5/066 . . . . {Trimmer condensators (capacitors in general H01G) }

G04F 5/08 . . using magnetostrictive resonators

G04F 5/10 . using electric or electronic resonators (G04F 5/14 takes precedence)

G04F 5/12 . using fluidic devices

G04F 5/14 . using atomic clocks

G04F 5/145 . . { using Coherent Population Trapping }

G04F 5/16 . using pulses produced by radioisotopes

G04F 7/00 **Apparatus for measuring unknown time intervals by mechanical means**

G04F 7/02 . by measuring the distance of fall or the final velocity of a falling body

G04F 7/04 . using a mechanical oscillator

WARNING

The subgroups of G04F/04 are not complete pending reclassification; see also this group

G04F 7/06 . . running only during the time interval to be measured, e.g. stop-watch

G04F 7/062 . . . { with reset mechanisms }
G04F 7/065 . . . { with start-stop control arrangements }
G04F 7/067 . . . . { with a single push-button or actuation member for start-stop and reset }
G04F 7/08 . . Watches or clocks with stop devices, e.g. chronograph
G04F 7/0804 . . . { with reset mechanisms }
G04F 7/0809 . . . . { with single hammers, i.e. one hammer acts on each counter }
G04F 7/0814 . . . . { with double hammer , i.e. one hammer acts on two counters }
G04F 7/0819 . . . . { with triple hammer, i.e. one hammer acts on three counters }
G04F 7/0823 . . . { with couplings between the chronograph mechanism and the base movement }
G04F 7/0828 . . . . { acting in the plane of the movement }
G04F 7/0833 . . . . { acting perpendicular to the plane of the movement }
G04F 7/0838 . . . . { involving a tilting movement }
G04F 7/0842 . . . { with start-stop control mechanisms }
G04F 7/0847 . . . . { with column wheel }
G04F 7/0852 . . . . { with member having a rotational two-way movement, e.g. navette }
G04F 7/0857 . . . . { with single push-button or actuation member for start-stop and reset }
G04F 7/0861 . . . . { actuated by other than push-buttons, e.g. bezel or lever }
G04F 7/0866 . . . { Special arrangements }
G04F 7/0871 . . . . { with multiple chronograph functions, i.e. to count multiple running times (alternate time counting G07C) }
G04F 7/0876 . . . . { Split-time function e.g. rattrappante }
G04F 7/088 . . . . { with display of fraction of seconds, e.g. foudroyante }
G04F 7/0885 . . . . { Modular constructions involving interchangeability with one or more chronograph modules on a single base movement }
G04F 7/089 . . . . { indicating measured time by other than hands; e.g. numbered bands, drums, discs or sheet (current time indication other than by hand G04B 19/20) }
G04F 7/0895 . . . . { with a separate barrel for the chronograph functions (barrel in a separable module G04F 7/08S08) }

G04F 7/10 . Means used apart from the time-piece for starting or stopping same {see provisionally too : G04F 8/08 }

G04F 8/00 **Apparatus for measuring unknown time intervals by electromechanical means**

G04F 8/003 . {using continuously running driving means }

G04F 8/006 . {running only during the time interval to be measured, e.g. stop-watch }

G04F 8/02 . using an electromechanical oscillator {G04F 5/00, G04F 10/00 take precedence }
G04F 8/04 . . using a piezoelectric oscillator {not used }
G04F 8/06 . . using a magnetostrictive oscillator {not used }

G04F 8/08 . Means used apart from the time-piece for starting or stopping same

G04F 10/00 **Apparatus for measuring unknown time intervals by electric means** { timing devices

for clocks or watches for comparing the rate of the oscillating member with a standard G04D 7/12; radar systems, analogous systems G01S 7/00; measuring frequency G01R 23/00; measuring phase angle G01R 25/00 }

G04F 10/005 . { Time-to-digital converters [TDC] (analog-to-digital converters with intermediate conversion to time or phase H03M 1/50, H03M 1/60)]

WARNING

This group is not complete pending reclassification; see also groups G04F 10/04 and G04F 10/06

G04F 10/02 . using oscillators with passive electric resonator, e.g. lumped LC {G04F 10/04, G04F 10/06 and G04F 10/10 take precedence }

G04F 10/04 . by counting pulses or half-cycles of an alternating current { (G04F 10/005 takes precedence) }

G04F 10/06 . by measuring phase { (G04F 10/005 takes precedence) }

G04F 10/10 . by measuring electric or magnetic quantities changing in proportion to time

G04F 10/105 . . {with conversion of the time-intervals }

G04F 13/00 **Apparatus for measuring unknown time intervals by means not provided for in groups G04F 5/00 to G04F 10/00**

G04F 13/02 . using optical means

G04F 13/023 . . {using cathode-ray oscilloscopes (circuits for inserting reference time markers for cathode-ray oscilloscopes G01R 13/305) }

G04F 13/026 . . {Measuring duration of ultra-short light pulses, e.g. in the pico-second range; particular detecting devices therefor (non-linear optics G02F 1/35; monitoring arrangements for lasers in general H01S 3/0014; photometry, radiation pyrometry G01J 1/00, G01J 5/00) }

G04F 13/04 . using electrochemical means

WARNING

Not complete, see also G04F 10/00

G04F 13/06 . using fluidic means

WARNING

Not complete, see also G04F 10/00