

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G04 HOROLOGY

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.

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:
[G04F 10/08](#) covered by [G04F 5/16](#)
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 | 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) | 3/04 | • . Additional arrangements in connection with ordinary non-electric clocks for this purpose |
| | | 3/06 | • with electric driving mechanisms |
| | | 3/08 | • . Additional arrangements in connection with ordinary electric clocks for this purpose |
| 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)} | 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) |
| 1/02 | • by consuming prefixed quantities of materials, e.g. by burning candle | 5/02 | • Metronomes {(periodic signalisation by acoustic signals in general G04B 21/005)} |
| 1/04 | • by movement or acceleration due to gravity | 5/022 | • . {Mechanic metronomes} |
| 1/06 | • . by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock | 5/025 | • . {Electronic metronomes (rhytm generation for electrophonic musical instruments G10H 1/36)} |
| 1/063 | • . . {using acoustic signalling} | 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)} |
| 1/066 | • . . {using electrical contact device} | | |
| 1/08 | • . by a body falling a prefixed distance in air or in a viscous material | 5/04 | • using oscillators with electromechanical resonators {producing electric oscillations or timing pulses} |
| 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) | 5/06 | • . using piezoelectric resonators |
| 3/02 | • with mechanical driving mechanisms | 5/063 | • . . {Constructional details (details of resonators in general H03H 9/02)} |
| 3/022 | • . {using mechanical signalling device} | 5/066 | • . . . {Trimmer condensators (capacitors in general H01G)} |
| 3/025 | • . {mechanically actuated (cigar or cigarette receptacles or boxes with means for limiting the frequency of smoking A24F 15/005)} | 5/08 | • . using magnetostrictive resonators |
| 3/027 | • . {using electrical contacts, e.g. for actuating electro-acoustic device} | 5/10 | • using electric or electronic resonators (G04F 5/14 takes precedence) |
| | | 5/12 | • using fluidic devices |
| | | 5/14 | • using atomic clocks |

- 5/145 . . {using [Coherent Population Trapping](#)}
- 5/16 . using pulses produced by radioisotopes
- 7/00 Apparatus for measuring unknown time intervals by mechanical means**
- 7/02 . by measuring the distance of fall or the final velocity of a falling body
- 7/04 . using a mechanical oscillator
- 7/06 . . running only during the time interval to be measured, e.g. stop-watch
- 7/062 . . . {with reset mechanisms}
- 7/065 . . . {with start-stop control arrangements}
- 7/067 {with a single push-button or actuation member for start-stop and reset}
- 7/08 . . Watches or clocks with stop devices, e.g. chronograph
- 7/0804 . . . {with reset mechanisms}
- 7/0809 {with single hammers, i.e. one hammer acts on each counter}
- 7/0814 {with double hammer, i.e. one hammer acts on two counters}
- 7/0819 {with triple hammer, i.e. one hammer acts on three counters}
- 7/0823 . . . {with couplings between the chronograph mechanism and the base movement}
- 7/0828 {acting in the plane of the movement}
- 7/0833 {acting perpendicular to the plane of the movement}
- 7/0838 {involving a tilting movement}
- 7/0842 . . . {with start-stop control mechanisms}
- 7/0847 {with column wheel}
- 7/0852 {with member having a rotational two-way movement, e.g. navette}
- 7/0857 {with single push-button or actuation member for start-stop and reset}
- 7/0861 {actuated by other than push-buttons, e.g. bezel or lever}
- 7/0866 . . . {Special arrangements}
- 7/0871 {with multiple chronograph functions, i.e. to count multiple running times ([alternate time counting G07C](#))}
- 7/0876 {Split-time function, e.g. rattrapante}
- 7/088 {with display of fraction of seconds, e.g. foudroyante}
- 7/0885 {Modular constructions involving interchangeability with one or more chronograph modules on a single base movement}
- 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](#))}
- 7/0895 {with a separate barrel for the chronograph functions ([barrel in a separable module G04F 7/0885](#))}
- 7/10 . Means used apart from the time-piece for starting or stopping same ([see provisionally too : G04F 8/08](#))
- 8/00 Apparatus for measuring unknown time intervals by electromechanical means**
- 8/003 . {using continuously running driving means}
- 8/006 . {running only during the time interval to be measured, e.g. stop-watch}
- 8/02 . using an electromechanical oscillator ([G04F 5/00, G04F 10/00 take precedence](#))
- 8/04 . . using a piezo-electric oscillator
- 8/06 . . using a magnetostrictive oscillator
- 8/08 . Means used apart from the time-piece for starting or stopping same
- 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](#))}
- 10/005 . {Time-to-digital converters [TDC] (analog-to-digital converters with intermediate conversion to time or phase [H03M 1/50, H03M 1/60](#))}
- 10/02 . using oscillators with passive electric resonator, e.g. lumped LC ([G04F 10/04, G04F 10/06 and G04F 10/10 take precedence](#))}
- 10/04 . by counting pulses or half-cycles of an alternating current ([G04F 10/005 takes precedence](#))}
- 10/06 . by measuring phase ([G04F 10/005 takes precedence](#))}
- 10/10 . by measuring electric or magnetic quantities changing in proportion to time
- 10/105 . . {with conversion of the time-intervals}
- 13/00 Apparatus for measuring unknown time intervals by means not provided for in groups [G04F 5/00 - G04F 10/00](#)**
- 13/02 . using optical means
- 13/023 . . {using cathode-ray oscilloscopes (circuits for inserting reference time markers for cathode-ray oscilloscopes [G01R 13/305](#))}
- 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](#))}
- 13/04 . using electrochemical means
- 13/06 . using fluidic means