

# 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](#))

#### 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.}

<b>1/00</b>	<b>Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals without driving mechanisms, e.g. egg timers</b>	<b>5/00</b>	<b>Apparatus for producing preselected time intervals for use as timing standards (generating clock signals for electric digital computers <a href="#">G06F 1/04</a>)</b>
1/005	• {using electronic timing, e.g. counting means (pulse time delay arrangements <a href="#">H03K 5/13</a> ; modifications of electronic switches for introducing a time delay before switching <a href="#">H03K 17/28</a> )}	5/02	• Metronomes
1/02	• by consuming prefixed quantities of materials, e.g. by burning candle	5/022	• • {Mechanic metronomes}
1/04	• by movement or acceleration due to gravity	5/025	• • {Electronic metronomes (rhytm generation for electrophonic musical instruments <a href="#">G10H 1/36</a> )}
1/06	• • by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock	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 <a href="#">G10H 3/00</a> )}
1/063	• • • {using acoustic signalling}	5/04	• using oscillators with electromechanical resonators {producing electric oscillations or timing pulses}
1/066	• • • {using electrical contact device}	5/06	• • using piezo-electric resonators
1/08	• • by a body falling a prefixed distance in air or in a viscous material	5/063	• • • {Constructional details}
<b>3/00</b>	<b>Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with driving mechanisms, e.g. dosimeters with clockwork</b>	5/066	• • • • {Trimmer condensators}
3/02	• with mechanical driving mechanisms	5/08	• • using magnetostrictive resonators
3/022	• • {using mechanical signalling device}	5/10	• using electric or electronic resonators ( <a href="#">G04F 5/14</a> takes precedence)
3/025	• • {mechanically actuated (cigar or cigarette receptacles or boxes with means for limiting the frequency of smoking <a href="#">A24F 15/005</a> )}	5/12	• using fluidic devices
3/027	• • {using electrical contacts, e.g. for actuating electro-acoustic device}	5/14	• using atomic clocks
3/04	• • Additional arrangements in connection with ordinary non-electric clocks for this purpose	5/145	• • {using Coherent Population Trapping}
3/06	• with electric driving mechanisms	5/16	• using pulses produced by radio-isotopes
3/08	• • Additional arrangements in connection with ordinary electric clocks for this purpose	<b>7/00</b>	<b>Apparatus for measuring unknown time intervals by non-electric means (using fluidic means <a href="#">G04F 13/06</a>)</b>
		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
- 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**
  - 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 ac {(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 (photometry, radiation pyrometry G01J 1/00, G01J 5/00; non-linear optics G02F 1/35)}
  - 13/04 . using electrochemical means
  - 13/06 . using fluidic means