

# 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.

<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 timer</b> (electric time and time-programme switches <a href="#">H01H 43/00</a> )	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
<b>1/005</b>	• {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> )}	<b>5/00</b>	<b>Apparatus for producing preselected time intervals for use as timing standards</b> (generating clock signals for electric digital computers <a href="#">G06F 1/04</a> ; regulating frequency in general <a href="#">H03C</a> , <a href="#">H03L</a> )
<b>1/02</b>	• by consuming prefixed quantities of materials, e.g. by burning candle	<b>5/02</b>	• Metronomes {(periodic signalisation by acoustic signals in general <a href="#">G04B 21/005</a> )}
<b>1/04</b>	• by movement or acceleration due to gravity	<b>5/022</b>	• . {Mechanic metronomes}
<b>1/06</b>	• . by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock	<b>5/025</b>	• . {Electronic metronomes (rhytem generation for electrophonic musical instruments <a href="#">G10H 1/36</a> )}
<b>1/063</b>	• . . {using acoustic signalling}	<b>5/027</b>	• . {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> )}
<b>1/066</b>	• . . {using electrical contact device}		
<b>1/08</b>	• . by a body falling a prefixed distance in air or in a viscous material	<b>5/04</b>	• using oscillators with electromechanical resonators {producing electric oscillations or timing pulses}
<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. dosimeter with clockwork</b> (electric time or time-programme switches <a href="#">H01H 43/00</a> )	<b>5/06</b>	• . using piezoelectric resonators
<b>3/02</b>	• with mechanical driving mechanisms	<b>5/063</b>	• . . {Constructional details (details of resonators in general <a href="#">H03H 9/02</a> )}
<b>3/022</b>	• . {using mechanical signalling device}	<b>5/066</b>	• . . . {Trimmer condensators (capacitors in general <a href="#">H01G</a> )}
<b>3/025</b>	• . {mechanically actuated (cigar or cigarette receptacles or boxes with means for limiting the frequency of smoking <a href="#">A24F 15/005</a> )}	<b>5/08</b>	• . using magnetostrictive resonators
<b>3/027</b>	• . {using electrical contacts, e.g. for actuating electro-acoustic device}	<b>5/10</b>	• using electric or electronic resonators ( <a href="#">G04F 5/14</a> takes precedence)
		<b>5/12</b>	• using fluidic devices
		<b>5/14</b>	• 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