CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H03 ELECTRONIC CIRCUITRY

H03L AUTOMATIC CONTROL, STARTING, SYNCHRONISATION OR STABILISATION OF GENERATORS OF ELECTRONIC OSCILLATIONS OR PULSES (generation of oscillations H03B)

NOTES

1. This subclass covers:
   - automatic control circuits for generators of electronic oscillations or pulses;
   - starting, synchronisation or stabilisation circuits for generators where the type of generator is irrelevant or unspecified.
2. In this subclass, the following expression is used with the meaning indicated:
   - "automatic control" covers only closed loop systems.

1/00 **Stabilisation of generator output against variations of physical values, e.g. power supply**

1/02 . against variations of temperature only

1/021 . . {of generators comprising distributed capacitance and inductance}

1/022 . . {by indirect stabilisation, i.e. by generating an electrical correction signal which is a function of the temperature (H03L 1/021 takes precedence)}

1/023 . . . {by using voltage variable capacitance diodes}

1/025 . . . . {and a memory for digitally storing correction values}

1/026 . . . {by using a memory for digitally storing correction values (H03L 1/025 takes precedence)}

1/027 . . . {by using frequency conversion means which is variable with temperature, e.g. mixer, frequency divider, pulse add/substract logic circuit (H03L 1/023, H03L 1/026 take precedence)}

1/028 . . {of generators comprising piezoelectric resonators (H03L 1/021, H03L 1/022 take precedence; oscillation generators with a piezoelectric resonator H03B 5/32)}

1/04 . . Constructional details for maintaining temperature constant

3/00 **Starting of generators**

5/00 **Automatic control of voltage, current, or power**

5/02 . of power

7/00 **Automatic control of frequency or phase; Synchronisation**

7/02 . using a frequency discriminator comprising a passive frequency-determining element

7/04 . . wherein the frequency-determining element comprises distributed inductance and capacitance

7/06 . using a reference signal applied to a frequency- or phase-locked loop

7/07 . . using several loops, e.g. for redundant clock signal generation

7/08 . . Details of the phase-locked loop

7/0802 . . . {the loop being adapted for reducing power consumption (H03L 7/14 takes precedence)}

7/0805 . . . {the loop being adapted to provide an additional control signal for use outside the loop}

7/0807 . . . {concerning mainly a recovery circuit for the reference signal}

7/081 . . . provided with an additional controlled phase shifter {(H03L 7/0998 takes precedence)}

7/0812 . . . . {and where no voltage or current controlled oscillator is used}

7/0814 . . . . . {the phase shifting device being digitally controlled}

7/0816 . . . . . {the controlled phase shifter and the frequency- or phase-detection arrangement being connected to a common input}

7/0818 . . . . . {the controlled phase shifter comprising coarse and fine delay or phase-shifting means}

7/083 . . . the reference signal being additionally directly applied to the generator

7/085 . . . concerning mainly the frequency- or phase-detection arrangement including the filtering or amplification of its output signal (H03L 7/10 takes precedence; circuits for comparing the phase or frequency of two mutually-independent oscillations H03D 13/00)

7/087 . . . . using at least two phase detectors or a frequency and phase detector in the loop

7/089 . . . . the phase or frequency detector generating up-down pulses (H03L 7/087 takes precedence)

7/0891 . . . . . {the up-down pulses controlling source and sink current generators, e.g. a charge pump}

7/0893 . . . . . {the up-down pulses controlling at least two source current generators or at least two sink current generators connected to different points in the loop}

7/0895 . . . . . {Details of the current generators (H03L 7/0893 takes precedence)}

7/0896 . . . . . {the current generators being controlled by differential up-down pulses}

7/0898 . . . . . {the source or sink current values being variable (H03L 7/0896 takes precedence)}
7/091 . . . . the phase or frequency detector using a sampling device (H03L 7/087 takes precedence)
7/093 . . . . using special filtering or amplification characteristics in the loop (H03L 7/087 - H03L 7/091 take precedence)
7/095 . . . . using a lock detector (H03L 7/087 takes precedence)
7/097 . . . . using a comparator for comparing the voltages obtained from two frequency to voltage converters
7/099 . . . concerning mainly the controlled oscillator of the loop
7/0991 . . . . {the oscillator being a digital oscillator, e.g. composed of a fixed oscillator followed by a variable frequency divider (H03L 7/0995 takes precedence; fixed oscillators with means for selecting among various phases H03L 7/0814)}
7/0992 . . . . . {comprising a counter or a frequency divider}
7/0993 . . . . . {and a circuit for adding and deleting pulses}
7/0994 . . . . . {comprising an accumulator}
7/0995 . . . . {the oscillator comprising a ring oscillator}
7/0996 . . . . . {Selecting a signal among the plurality of phase-shifted signals produced by the ring oscillator}
7/0997 . . . . . {Controlling the number of delay elements connected in series in the ring oscillator}
7/0998 . . . . . {using phase interpolation}
7/10 . . . for assuring initial synchronisation or for broadening the capture range
7/101 . . . . {using an additional control signal to the controlled loop oscillator derived from a signal generated in the loop (H03L 7/113, H03L 7/187 take precedence)}
7/102 . . . . . {the additional signal being directly applied to the controlled loop oscillator}
7/103 . . . . . {the additional signal being a digital signal}
7/104 . . . . {using an additional signal from outside the loop for setting or controlling a parameter in the loop (H03L 7/107, H03L 7/12 take precedence)}
7/105 . . . . {Resetting the controlled oscillator when its frequency is outside a predetermined limit}
7/107 . . . . using a variable transfer function for the loop, e.g. low pass filter having a variable bandwidth
7/1072 . . . . . {by changing characteristics of the charge pump, e.g. changing the gain}
7/1075 . . . . . {by changing characteristics of the loop filter, e.g. changing the gain, changing the bandwidth (H03L 7/1072 takes precedence)}
7/1077 . . . . . {by changing characteristics of the phase or frequency detection means (H03L 7/1072 takes precedence)}
7/113 . . . . using frequency discriminator
7/12 . . . . using a scanning signal
7/14 . . . for assuring constant frequency when supply or correction voltages fail {or are interrupted}
7/141 . . . . {the phase-locked loop controlling several oscillators in turn}
7/143 . . . . {by switching the reference signal of the phase-locked loop}
7/145 . . . . . {the switched reference signal being derived from the controlled oscillator output signal}
7/146 . . . . {by using digital means for generating the oscillator control signal (H03L 7/141, H03L 7/143 take precedence)}
7/148 . . . . . {said digital means comprising a counter or a divider}
7/16 . . Indirect frequency synthesis, i.e. generating a desired one of a number of predetermined frequencies using a frequency- or phase-locked loop
7/18 . . . using a frequency divider or counter in the loop (H03L 7/20, H03L 7/22 take precedence)
7/1803 . . . . {the counter or frequency divider being connected to a cycle or pulse swallowing circuit}
7/1806 . . . . {the frequency divider comprising a phase accumulator generating the frequency divided signal}
7/181 . . . . a numerical count result being used for locking the loop, the counter counting during fixed time intervals {(H03L 7/1806 takes precedence)}
7/183 . . . . a time difference being used for locking the loop, the counter counting between fixed numbers or the frequency divider dividing by a fixed number {(H03L 7/1806 takes precedence)}
7/185 . . . . . using a mixer in the loop (H03L 7/187 - H03L 7/195 take precedence)
7/187 . . . . . using means for coarse tuning the voltage controlled oscillator of the loop (H03L 7/191 - H03L 7/195 take precedence)
7/189 . . . . . comprising a D/A converter for generating a coarse tuning voltage
7/191 . . . . . using at least two different signals from the frequency divider or the counter for determining the time difference (H03L 7/193, H03L 7/195 take precedence)
7/193 . . . . . the frequency divider/counter comprising a commutable pre-divider, e.g. a two modulus divider
7/195 . . . . . in which the counter of the loop counts between two different non zero numbers, e.g. for generating an offset frequency (H03L 7/193 takes precedence)
7/197 . . . . a time difference being used for locking the loop, the counter counting between numbers which are variable in time or the frequency divider dividing by a factor variable in time, e.g. for obtaining fractional frequency division {(H03L 7/1806 takes precedence)}
7/1972 . . . . . {for reducing the locking time interval (H03L 7/1974, H03L 7/199 take precedence)}

7/1974 . . . . . {for fractional frequency division}
7/1976 . . . . . {using a phase accumulator for controlling the counter or frequency divider}
7/1978 . . . . . {using a cycle or pulse removing circuit}
7/199 . . . . . with reset of the frequency divider or the counter, e.g. for assuring initial synchronisation
7/20 . . . using a harmonic phase-locked loop, i.e. a loop which can be locked to one of a number of harmonically related frequencies applied to it (H03L 7/22 takes precedence)
7/22 . . . using more than one loop
7/23 . . . . with pulse counters or frequency dividers
7/235 . . . . . {Nested phase locked loops}
7/24 . using a reference signal directly applied to the generator
7/26 . using energy levels of molecules, atoms, or subatomic particles as a frequency reference

9/00 Automatic control not provided for in other groups of this subclass

2207/00 Indexing scheme relating to automatic control of frequency or phase and to synchronisation
2207/04 . Modifications for maintaining constant the phase-locked loop damping factor when other loop parameters change
2207/05 . Compensating for non-linear characteristics of the controlled oscillator
2207/06 . Phase locked loops with a controlled oscillator having at least two frequency control terminals
2207/08 . Modifications of the phase-locked loop for ensuring constant frequency when the power supply fails or is interrupted, e.g. for saving power
2207/10 . Indirect frequency synthesis using a frequency multiplier in the phase-locked loop or in the reference signal path
2207/12 . Indirect frequency synthesis using a mixer in the phase-locked loop
2207/14 . Preventing false-lock or pseudo-lock of the PLL
2207/18 . Temporarily disabling, deactivating or stopping the frequency counter or divider
2207/50 . All digital phase-locked loop