

## Title (en)

Electronic timepiece with an analogous display having a seconds indicating organ.

## Title (de)

Elektronisches Uhrwerk mit analoger Anzeige, die ein Sekunden anzeigendes Organ enthält.

## Title (fr)

Pièce d'horlogerie électronique à affichage analogique comportant un organe indicateur de secondes.

## Publication

**EP 0217164 A1 19870408 (FR)**

## Application

**EP 86112165 A 19860903**

## Priority

CH 392085 A 19850911

## Abstract (en)

1. An electronic timepiece with analog display comprising : - an oscillator (1; 1') - a frequency divider (2; 2') connected to said oscillator ; - a first indicator member (6; 6') for displaying the seconds and a second indicator member (7; 8') for displaying another time information ; - a first motor (5; 5') comprising a rotor (27) with a permanent magnet (28) carried by a shaft mechanically coupled to the first indicator member for driving this last one ; - a first control circuit (4; 4') connected to the frequency divider to control the first motor ; - a second motor (12; 12') which functions step-by-step in response to voltage drive pulses for driving the second indicator member ; - a second control circuit (11; 11') also connected to the frequency divider to produce said voltage drive pulses and apply to the second motor ; and - a correction device (14-20; 14'-20', 23) allowing the timepiece to be changed from a normal functioning mode to a correction mode and vice versa and at least the time information displayed by the second indicator member to be modified, when the timepiece is in the correction mode, characterized by the fact that the first motor (5; 5') comprises at least two coils (38, 39; 38', 39') and that the first control circuit (4; 4') is designed to apply continuously to these coils variable voltages (V1 , V2 ) which allow the rotor (27) of this first motor to be subjected to a rotating magnetic field in such a way that said first indicator member (6; 6') moves forward by making at least five jumps per second, so long as said timepiece is in the normal functioning mode.

## Abstract (fr)

La pièce d'horlogerie comprend un premier moteur (5) pour entraîner une aiguille de secondes (6) et un second (12) pour entraîner des aiguilles de minutes (7) et d'heures (8). Lorsque la pièce d'horlogerie fonctionne normalement, le premier moteur, qui comporte au moins deux bobines, est commandé en permanence par des tensions variables de façon que son rotor soit soumis à un champ magnétique tournant et que l'aiguille des secondes progresse en faisant au moins cinq sauts par seconde. De plus, ces tensions sont de préférence telles que le rotor fasse un tour par minute afin que l'aiguille des secondes puisse être fixée directement sur son axe. Le second moteur est, lui, un moteur pas à pas classique, de préférence bidirectionnel.

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## IPC 8 full level

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- [A] GB 2087601 A 19820526 - CITIZEN WATCH CO LTD
- [A] GB 2110846 A 19830622 - CITIZEN WATCH CO LTD
- [A] FR 2209251 A1 19740628 - CITIZEN WATCH CO LTD [JP]
- [A] EP 0087387 A1 19830831 - EBAUCHESFABRIK ETA AG [CH]
- [A] BULLETIN ANNUEL DE LA SOCIETE SUISSE DE CHRONOMETRIE, vol. 11, no. 1, 1982, pages 147-151, Neuchâtel, CH; R. GRANDJEAN: "Moteur biphasé pour montre à quartz"
- [A] ELEKTRONIK, vol. 29, no. 26, décembre 1980, pages 43-46, Munich, DE; H. GUGG et al.: "Schrittmotoren optimal angesteuert"
- [A] ELEKTRONIK, vol. 33, no. 1, janvier 1983, pages 37-39, Munich, DE; T. WITTCHEN: "Minischritt-Steuerung für 2-Phasen-Schrittmotoren mit geschalteten Stromreglern"

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