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[Continued on next page]

(54) Title: BIOMETRIC IDENTIFICATION SYSTEM USING PULSE WAVEFORM

(57) Abstract: A biometric identity confirmation system is based on pulse waveform data for the subject. During an initial enrollment mode, pulse waveform data for a known subject are used to generate subject characterization data for the known subject. The subject characterization data includes an exemplar created by synchronous averaging of pulse waveform data over multiple pulse cycles. A number of trigger candidates are identified for the start point of each pulse cycle. The time delay between trigger candidates is analyzed to discard false trigger candidate and identify true candidates, which are then used as the start points for each pulse cycle in synchronous averaging of the pulse waveform data. During a subsequent identity. authentication mode, pulse waveform data for a test subject are analyzed using the subject characterization data to confirm whether the identity of the test subject matches the known subject.

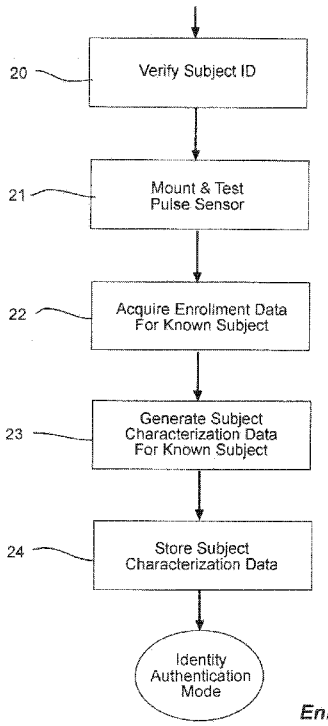

Fig. 1

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MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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PCT/US 14/41004

A. CLASSIFICATION OF SUBJECT MATTER
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CPC - G06F 21/32
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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CPC: G06F 21/32 or G07C 9/00087 or G07C 9/00158 or A61B 5/117 or G06K 9/00

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Patbase; Google Scholar; biometric, identification, pulse, wave, waveform, average, cycle, time delay, trigger, analyze, false, true, accurate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2012/138663 A2 (Phillips et al.) 11 October 2012 (11.10.2012) entire document (especially pg. 6, ln 19-22; pg. 14, ln 20-24; pg. 15, ln 8-9; pg. 16, ln 21-26; pg. 18, ln 12-22; pg. 20, ln 8-10; pg. 25, ln 34-35; pg. 29, ln 21-25),	1-11
Y	US 2006/0013445 A1 (Lange) 19 January 2006 (19.01.2006) (para [0026], [0068]-[0070])	1-11

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* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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