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30 October 2014

(54) Title: CONCRETE MIXTURE MEASUREMENT SENSOR, SYSTEM AND METHOD

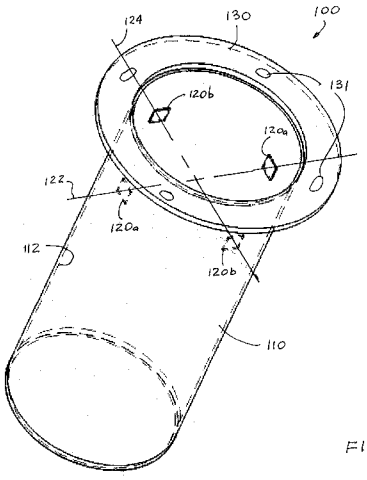

FIG. 4

(57) Abstract: A sensor measures slump and rheological characteristics of the concrete and is connected to a system that adjusts the slump by monitoring the sensor within the interior surface of a concrete mixer and controlling liquid additions. Data is analyzed by a computer processing unit to determine the slump and rheological characteristics of the concrete, liquid required to meet the slump requirements. The measurement done by the sensor is more accurate then the existing methods because it brings into consideration the effect of the helix inside the mixer on the movement of the concrete mixture inside the mixer. Furthermore, this method also allows the operation of the sensor in "real" life situations where the rotation speed of the mixer can't be maintained at a fixed value. The fact that the sensor rotates with the drum and that the concrete mixture is pushed to the bottom of the mixing drum guaranties that all the concrete is "sampled" by comparing results collected from each revolution of the mixing drum.

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INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER
IPC (2014.01) B28C 7/02, G01N 11/00

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)
IPC (2014.01) G01N 11/00, B28C 7/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Databases consulted: THOMSON INNOVATION, Esp@cenet, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012204625 A1 I.B.B RHEOLOGIE INC [CA] 16 Aug 2012 (2012/08/16) Entire document	1
A	Entire document	2-4,10,11,15
Y	US 3129928 A BUTLER BIN COMPANY (US) 21 Apr 1964 (1964/04/21) Entire document	5,6
A	Entire document	7,16,17
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A	US 3640121 A Marcier (US) 08 Feb 1972 (1972/02/08) Entire Document	1-4,10,11,15

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* 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
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 Jul 2014	21 Jul 2014
Name and mailing address of the ISA: Israel Patent Office Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel Facsimile No. 972-2-5651616	Authorized officer ORGAD Yaniv Telephone No. 972-2-5651787

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International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009171595 A1 Bonilla Benegas (ES) 02 Jul 1972 (1972/07/02) Entire documents	1-4,10,11,15
A	US 2011077778 A1 Berman (CA) 31 Mar 2011 (2011/03/31) Entire document	1-4,10,11,15
A	US 4335966 A ELBA WERK MASCHINEN GMBH & CO (DE) 22 Jun 1982 (1982/06/22) Entire document	5-9,16,17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2014/000024

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet.

1. [X] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[X] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2014/000024

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet):

* This International Searching Authority found multiple inventions in this international application, as follows:

Invention/s 1	A concrete mixture sensor, measuring the force applied by the concrete on a first axis and on a second axis.	Claim/s 1-4,10,11,15
Invention/s 2	A concrete mixture sensor measuring the concrete resistance and impedance using electrodes mounted on a non conductive body.	Claim/s 5-9,16,17
Invention/s 3	A dual layered protective cover of concrete mixture sensor.	Claim/s 12-14

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2014/000024

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