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[Continued on next page]

(54) **Title**: SONAR METHOD AND APPARATUS FOR DETERMINING MATERIAL INTERFACES IN WHEEL SERVICING EQUIPMENT

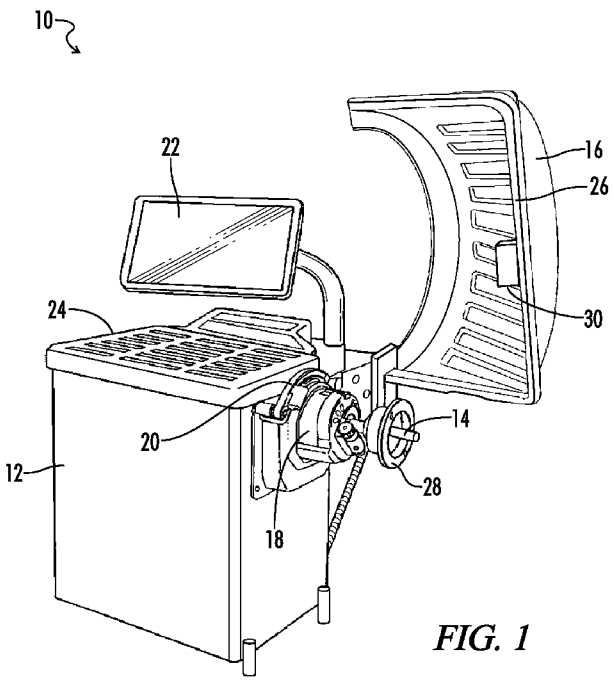

FIG. 1

(57) **Abstract**: A wheel servicing machine (10) such as a wheel balancer includes an acoustic transducer (30) configured to measure energy of one or more reflected acoustic waves after the waves have bounced off a material boundary surface such as a wheel assembly (100). In some embodiments, a return energy index signal (84) representative of the measured energy is generated by a transducer and is further processed by a processor to control operations of the machine. The acoustic transducer also measures distance between the transducer and the wheel assembly surface in some embodiments. One or more values in a sample queue of acquired distance data may be flagged, or indexed, based on variation in the magnitude of the return energy signal. Methods of measuring wheel width using sonar measurement of both distance and reflected energy are also provided.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

G01M 1/22(2006.01)i, G01M 1/16(2006.01)i, G01M 17/02(2006.01)i

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)

G01M 1/22; G01M 1/02; G08B 21/00; B29H 21/08; G06K 9/00; B27B 1/00; G01N 29/04

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

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: 'tire', 'wheel', 'ultrasonic', 'reflection', 'balancer'

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009-0267784 A1 (BRAGHIROLI FRANCESCO et al.) 29 October 2009 See paragraph [0025] and figure 1.	21
X	US 04356850 A (HALGRIMSON; DARRELL N. et al.) 02 November 1982 See column 3, line 44 - column 4, line 19, and figure 1.	25
X	US 04372366 A (DUGGER; DOYLE L.) 08 February 1983 See abstract, column 3, line 22 - column 4, line 54, and figure 1.	27
Y A	US 05189912 A (QUINLAN; MICHAEL M. et al.) 02 March 1993 See abstract, column 9, line 15 - column 12, line 42, and figures 1,9.	1-3,8,9,11,15 4-7,10,12-14,16-20 ,22-24,26,28
Y A	US 04089225 A (KRASKA; IRVIN R. et al.) 16 May 1978 See abstract, column 9, line 5 - column 10, line 16, and figure 1.	1-3,8,9,11,15 4-7,10,12-14,16-20 ,22-24,26,28

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

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Information on patent family members

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