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(71) Applicant: **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02139 (US).

(72) Inventors: **PANAS, Cynthia, Dawn Walker**; 471 Memorial Drive, Apt. 3506, Cambridge, MA 02139 (US). **PANAS, Robert, Matthew**; 471 Memorial Drive, Apt. 3506, Cambridge, MA 02139 (US). **YOUCEF-TOUMI, Kamal**; 25 Magnolia Avenue, #1, Cambridge, MA 02138 (US).

(74) Agents: **CONNORS, Matthew, E.** et al.; Gesmer Updegrove LLP, 40 Broad Street, Boston, MA 02109 (US).

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(54) Title: NON-ITERATIVE MAPPING OF CAPPED CYLINDRICAL ENVIRONMENTS

(57) Abstract: Method for mapping capped cylindrical environments. The method uses an algorithm for creating an environment map through 3D data segmentation and fitting of right planar capped cylinders. The algorithm implementing the method of the invention offers improved robustness, accuracy and speed over existing segmentation and fitting methods. The improved properties of the invention are achieved through the use of a Gauss map, 3D histogram and shape knowledge driven segmentation. Performance was demonstrated on a variety of cylinders using simulated data.

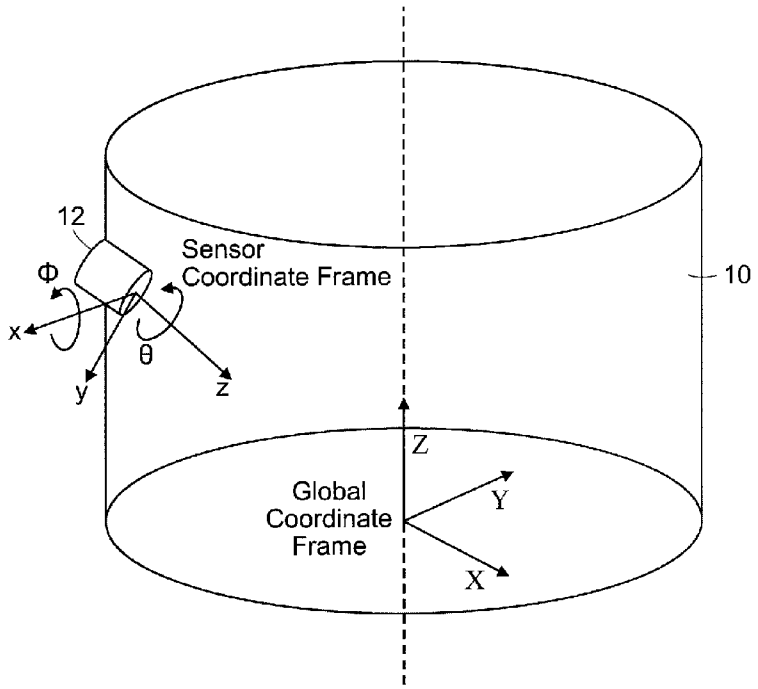


FIG. 1

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A. CLASSIFICATION OF SUBJECT MATTER
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USPC - 382/106
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); IP.com; IEEE; Google/Google Scholar; KEYWORDS: Range laser neighbor normal fit cylinder

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PFEIFER N et al., "AUTOMATIC RECONSTRUCTION OF SINGLE TREES FROM TERRESTRIAL LASER SCANNER DATA" Proceedings of 20th ISPRS Congress. 2004. Retrieved from [http://218.196.194.5/portal/wenxian/gis%20article/533.pdf], page 3.	1-8
Y	MASURAHA V et al., "Advanced Aboveground Storage Tank Inspections In-Service Robotics Tank Inspections", Presented at the 2004 NPRA Environmental Conference. Retrieved from [www.trinityconsultants.com/WorkArea/DownloadAsset.aspx?id=1642], Figure 1 , page 7.	1-8
Y	CHAPERON T et al., "Extracting cylinders in full 3D data using a random sampling method and the Gaussian image", Proceeding VMV '01 Proceedings of the Vision Modeling and Visualization Conference 2001. Retrieved from [http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.23.5998&rep=rep1&type=pdf], page 3.	5
Y	BINNEY J et al., "3D Tree Reconstruction from Laser Range Data" Robotics and Automation, 2009. ICRA '09. IEEE International Conference on , vol., no., pp.1321,1326, 12-17 May 2009. Retrieved from [http://robotics.usc.edu/publications/media/uploads/pubs/598.pdf].	8

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Date of the actual completion of the international search	Date of mailing of the international search report
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