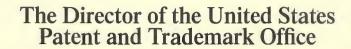
The United States of America



Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Michelle K. Lee

Director of the United States Patent and Trademark Office



US009476538B2

(12) United States Patent Kim

(10) Patent No.: US 9,476,538 B2

(45) **Date of Patent:**

Oct. 25, 2016

(54) PIPE INSULATION APPARATUS HAVING FINISHING COVER OF COMPRESSION-BONDED STRUCTURE

(71) Applicant: **DONG IN ENGINEERING CO.,**

LTD., Gyeongju (KR)

(72) Inventor: Kook Soo Kim, Gyeongju (KR)

(73) Assignee: **DONG IN ENGINEERING CO.,**

LTD., Gyeongju-Si (KR)

(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 15/027,760

(22) PCT Filed: May 27, 2014

(86) PCT No.: PCT/KR2014/004732

§ 371 (c)(1),

(2) Date: Apr. 7, 2016

PCT Pub. No.: WO2015/068920PCT Pub. Date: May 14, 2015

(65) Prior Publication Data

US 2016/0245452 A1 Aug. 25, 2016

30) Foreign Application Priority Data

Nov. 11, 2013 (KR) 10-2013-0136269

51) **Int. Cl.**

 F16L 9/14
 (2006.01)

 F16L 59/16
 (2006.01)

 F16L 59/02
 (2006.01)

 F16L 59/10
 (2006.01)

(Continued)

52) U.S. Cl. CPC F16L 59/163 (2013.01); F16L 59/024

(2013.01); F16L 59/103 (2013.01); F16L 59/11 (2013.01); F16L 59/161 (2013.01); F16L 59/184 (2013.01); F16L 59/22 (2013.01)

(58) Field of Classification Search

USPC 138/149, 151, 155, 158, 162, 163, 167, 138/169

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

(Continued)

FOREIGN PATENT DOCUMENTS

JP 07-038894 7/1995 JP 11-118090 4/1999

(Continued)

Primary Examiner — James Hook (74) Attorney, Agent, or Firm — Lex IP Meister, PLLC

(57) ABSTRACT

In a pipe insulation apparatus includes a plurality of segments which are connected so as to be separable along division lines, and each of the plurality of segments is composed of a plurality of insulation layers, and is covered by a finishing cover. The finishing cover includes: at least one joint chassis that is made of a soft metal material, and has a first insertion groove and a second insertion groove formed at a first end portion and a second end portion, respectively, and has a saw-toothed first protrusion formed on one inner side surface of each of the first insertion groove and the second insertion groove and a saw-toothed second protrusion formed alternately with the first protrusion on the other inner side surface; and a plurality of plates that is made of a soft metal material.

5 Claims, 11 Drawing Sheets

