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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

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Michelle K. Lee

Director of the United States Patent and Trademark Office

(12) **United States Patent**
Kim

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

(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)

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(58) **Field of Classification Search**
USPC 138/149, 151, 155, 158, 162, 163, 167, 138/169

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See application file for complete search history.

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(56) **References Cited**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

U.S. PATENT DOCUMENTS

155,493 A * 9/1874 Chapman F16L 9/003
138/158
822,004 A * 5/1906 Kronauer F16L 9/003
138/158

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(Continued)

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FOREIGN PATENT DOCUMENTS

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

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(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.

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5 Claims, 11 Drawing Sheets

