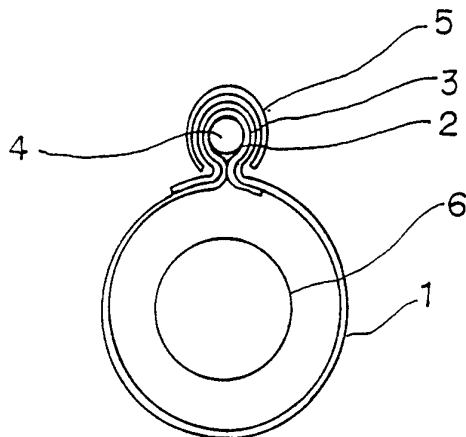
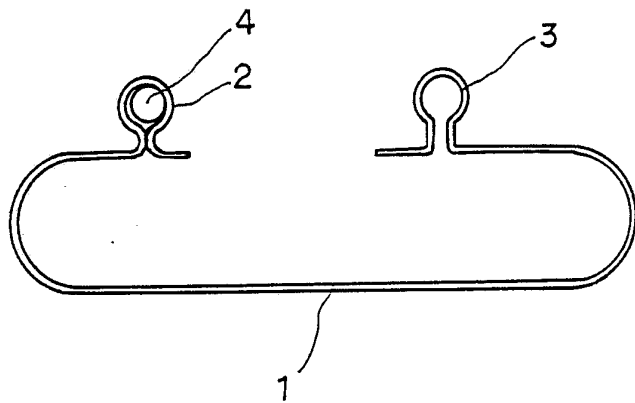




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification<sup>5</sup> : F16L 13/00, H02G 15/18 F16B 4/00</p>	A1	<p>(11) International Publication Number: <b>WO 93/09373</b></p> <p>(43) International Publication Date: 13 May 1993 (13.05.93)</p>
<p>(21) International Application Number: PCT/KR92/00055</p> <p>(22) International Filing Date: 30 October 1992 (30.10.92)</p> <p>(30) Priority data: 1991-19277 31 October 1991 (31.10.91) KR</p> <p>(71) Applicant (for all designated States except US): GOLDSTAR CABLE CO., LTD. [KR/KR]; 20, Yeouido-dong, Youngdungpo-ku, Seoul 150-010 (KR).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only) : CHOI, Jong, Chul [KR/KR]; LEE, Jong, Ho [KR/KR]; KIM, Jun, Sun [KR/KR]; YANG, Young, Kyu [KR/KR]; 555, Hokue-dong, An Yang-shi, Kyungki-do 430-080 (KR).</p>		<p>(74) Agent: SOHN, Eun, Jin; Eun Jin Sohn Patent and Law Office, No. 201, Cambridge Bldg., 825-18 Yeoksam-dong, Kangnam-ku, Seoul 135-080 (KR).</p> <p>(81) Designated States: JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE).</p> <p><b>Published</b> <i>With international search report.</i></p>

## (54) Title: A SHRINKABLE SLEEVE FOR CONNECTING PIPES AND CABLES



## (57) Abstract

The object of the invention is to provide a method for complete sealing and combining of a sleeve (1) that by bending both ends of a sleeve (1) are hollow rails (2, 3) formed, one (2) of which is combined with a sealing member (4), the other rail (3) which is larger unites with the one rail (2) to form a two fold rail to which C-type channel sticks and, finally complete sealing and combining of the sleeve (1) is accomplished by heating and shrinking.

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**A SHRINKABLE SLEEVE FOR CONNECTING PIPES AND CABLES****BACKGROUND OF THE INVENTION**

## 05       Field of the Invention

The present invention relates to a heat-shrinkable sleeve for connecting pipes and cables.

## Description of the Prior Art

10       Generally, connecting sleeves are required to wrap the connective positions of oil pipes, gas pipes, or many kinds of cables in order to protect those positions from water, moisture, distructing actions by insects or animals, or from chemical materials.

Such connecting sleeves are made of synthetic fiber materials or  
15 base materials of polymer which tend to be shrinked by heating.

In order to seal and connect a pipe or a cable by means of such a heat-shrinkable sleeve, the present invention has been made by way of the process such as wrapping a sealing member doubly with both ends of the sleeve and joining a C-type channel thereto, which brings forth  
20 complete sealing effect together with strong combination and results in a thorough protection of the inner side of the heat-shrinkable sleeve by holding off air, water, moisture and other invasions from outside.

In the conventional designs for connecting a sleeve, one is that  
25 rails 12 are formed at both ends of a sleeve 11 in a heat -shrinkable sleeve 11 being made and a C-type channel is joined to the rails 12, as shown in Fig.3. . Another design is that both ends of a sleeve 21 are bent symmetrically to form hollow rails 22, into which a sealing member 24 is inserted, and then a C-type channel is joined to both the

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rails 22 to connect and attach the sleeve, as shown in Fig.4.

According to the sleeves known so far, however, in case the rails 12 formed at both ends of the sleeve 11 are heated with the C-type channel combined, referring to Fig.3, each position of the rails is  
05 shrunk not so constantly(i.e. contraction ratios are not constant based on thickness and width of the rails) that gaps can be left not only between two rails 12 but also between each end of the C-type channel and the rails 12.

Accordingly, from the above prior approach does a problem arise  
10 in that complete sealing effect cannot be found. Even in case the rails 22 formed at both ends of a sleeve 21, as seen in Fig.4, are heated and shrunk with sealing members 24 inserted and a C-type channel 23 combined so as to solve the problem, the sealing ability is not much improved.

15 In other words, since this cannot overcome such a combining method as described in Fig.3 and is no more than a reinforcement of the binding position by inserting sealing members 24 into hollow rails 22, the sealing ability cannot be improved.

The prior arts, therefore, have a problem in that even a very  
20 small amount of air or water flowing into the sleeve cannot be completely excluded and this says that the sleeve does not exert its function.

#### SUMMARY OF THE INVENTION

25

The present invention has been made in view of the above -described problems of the prior art and an object of the invention is to provide a method for complete sealing and combining of a sleeve in which outside substances such as air, water, etc. can be entirely

excluded.

In accordance with the present invention, the object mentioned above can be accomplished by providing a method comprising: making hollow rails of the ends of a sleeve; inserting a sealing member into  
05 the one of the hollow rails which is smaller than the other; wrapping the hollow rail including the sealing member in the other one; and joining a C-type channel thereto, thereby allowing the ends of the sleeve to be sealed.

#### 10 BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features and advantages of the invention will become more apparent upon a reading of the following detailed specification and drawings, in which:

15 Fig.1 is a side view a sleeve according to the present invention;

Fig.2 is a side view showing the combined form of a sleeve according to the present invention; and

Figs.3 and 4 are side views showing the combined forms of the known sleeves.

20

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be further described by referring to the above accompanying drawings.

25 In the conventional method for sealing a cable or a pipe comprising: making rails not being empty 12 or making hollow rails 22 symmetrically of heat-shrinkable sleeves 11,21 to be shrunk, coiled and attached to the outer circumference of a cable or a pipe 6; inserting sealing members 24 into the rails ; joining a C-type channel

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thereto; heating and shrinking the sleeve 21, thereby allowing the sealing members 24 and the hollow rails 22 to be shrunk and sealed, and the connecting position of the pipe 6 to be sealed, referring to Figs.1 and 2, there is shown a heat-shrinkable sleeve 1 prepared by  
05 bending both the ends of the sleeve to form hollow rails 2,3 symmetrically one 3 of which is larger than the other, making the hollow rail 3 wrap the other 2, inserting a sealing member which is insoluble when the sleeve 1 is shrunk by heating into the hollow rail 2, and finally joining a C-type channel 5 to the outside of  
10 doubly overlapped hollow rails 2, 3.

The embodiments and their effects regarding the present invention as described in the above are to be explained hereinafter in detail.

First, the heat-shrinkable sleeve 1 as shown in Fig.1 is wrapped  
15 around the connective outer surface of a cable or a pipe 6 which is subject to being sealed and connected. Upon pressing the hollow rail 3 toward the other hollow rail 2 combined with a sealing member 4, the former is joined to the latter as the open space of the former becomes wide.

20 Second, when the C-type channel 5 is fitted to the outer surface of the hollow rail 3, the preliminary steps for sealing and connecting are finished, as shown in Fig.2.

Third, while the sleeve 1 is heated for the purpose of binding together, the hollow rail 3 formed integrally with the sleeve 1 is  
25 shrunk and the other hollow rail 2 pressed on the sealing member 4 is the same, and thus the first becomes pressed on the second.

At this time, as hollow rails 2, 3 decrease in length, they occupy inner space of C-type channel 5 and, at the same time, one end of hollow rail 2 and that of hollow rail 3 adhere closely to inner

- 5 -

surface and outer surface of sleeve 1, respectively and thus sealing for binding together is finished hereby.

In case where thermosensitive adhesives such as hot melts are applied to sleeve, the thermosensitive adhesives to inner surface of  
05 hollow rail 3 are thermally melt and sticked to the outer surface of hollow rail 2 and thus the adhesion of both the hollow rails 2, 3 becomes stronger.

In addition, since sealing member 4 serves as a wedge even after shrinking, that is, since hollow rails 2, 3 are pressed with occupying  
10 the space between C-type channel 5 and sealing member 4, C-type channel does not come off hollow rail 3.

As apparent from the above description, the present invention has been made for the purpose not only of preventing a gap in a combining position by shrinking and attaching doubly hollow rails and thus  
15 excluding external substances but of maintaining complete sealing of the space between C-type channel and sealing member as the twofold hollow rails are pressed and bound tightly therein.

20

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**WHAT IS CLAIMED IS:**

1. In a known method for sealing, combining and attaching the connective position of a cable or a pipe by way of such process as  
05 hollow rails are formed by bending both the ends of a heat-shrinkable sleeve that consists of single substance, each sealing member is inserted into said hollow rails whose outer surface is combined with C-type channel subsequently, and then the sleeve is heated and shrunk, which results in sealing, combining and attaching the  
10 connective position of cable or pipe, a heat-shrinkable sleeve for connecting a cable or a pipe which is made by such process as hollow rails and are formed symmetrically at both the ends of a heat-shrinkable sleeve, the former of which is occupied with sealing member, the latter of which is opened to inset hollow rail, and then  
15 C-type channel is joined to the outer surface of hollow rail to make two hollow rails and pressed, attached and bound between C-type channel and sealing member by heating and shrinking the sleeve.

2. A heat-shrinkable sleeve for connecting a pipe and a cable  
20 according to Claim 1, which enables the ends of the above hollow rails to adhere closely to the inner and the outer surfaces of a sleeve, respectively, after both rails occupying completely the space between the sealing member and the C-type channel when they are shrunk by heating.

25

3. A heat-shrinkable sleeve for connecting pipe and cable according to Claim 1, which is made by applying thermosensitive adhesives to the inner surface of the above hollow rail.

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FIG. 1

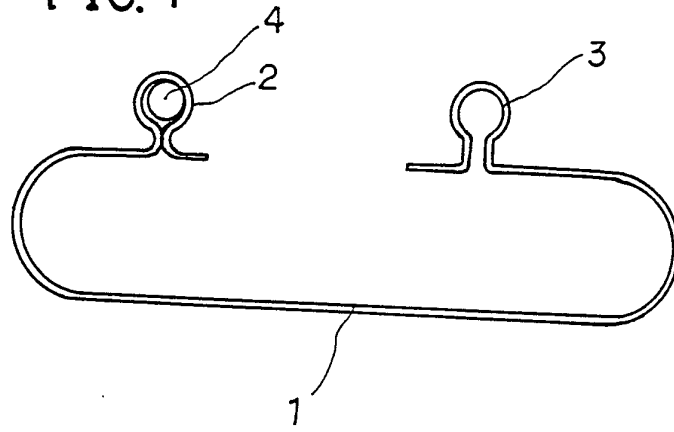


FIG. 2

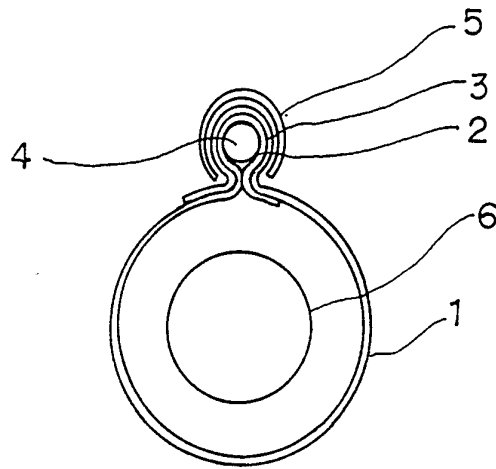


FIG. 3

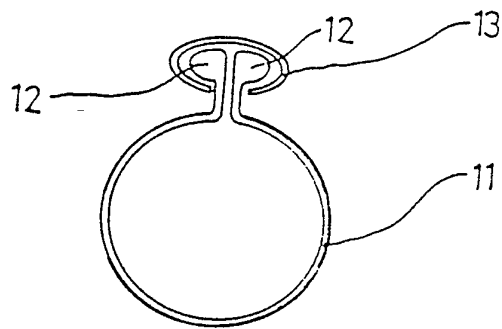
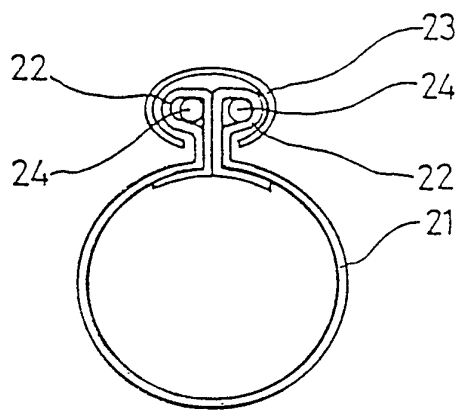


FIG. 4



**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/KR 92/00055

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC<sup>5</sup>: F 16 L 13/00, H 02 G 15/18, F 16 B 4/00

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<sup>5</sup>: F 16 L 13/00, 47/00, 47/02, 25/00; F 16 B 4/00; H 01 R 4/72, 11/28;  
H 02 G 15/18; B 32 B 7/00, 7/10; B 23 P 11/02

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

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE, A1, 2 635 001 (N.V. RAYCHEM S.A. KESSEL-LO) 24 February 1977 (24.02.77), totality.	1-3
A	US, A, 3 988 399 (EVANS) 26 October 1976 (26.10.76), totality.	

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

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Date of the actual completion of the international search  
13 January 1993 (13.01.93)

Date of mailing of the international search report  
20 January 1993 (20.01.93)

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