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(54) **Title:** PRE-INSULATED COMPONENTS

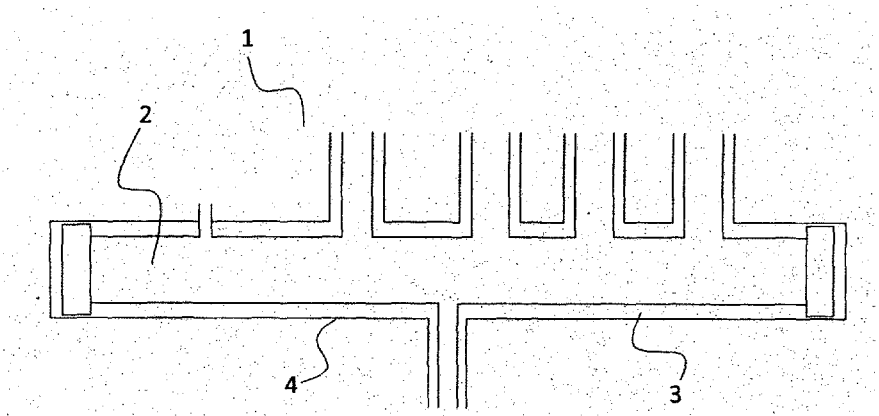

Fig. 1

(57) **Abstract:** The invention relates to pre-insulated components for heating, air-conditioning and water supply installations, which consist of an inner pipe (2) with an outer sheath (4), wherein between them a suitable insulating material (3) is arranged. On the outer sheath holes (5) are provided, which are sealed by caps, so that injection of insulating material (3) may be performed as required. The pre-insulated components are screwed between them or have male and female buttons. As materials for the pipe (2) and the sheath (4), poly(vinyl chloride), polypropylene, polyethylene, polyolefins, cupper or iron may be employed. As insulation, polyurethane or any other swellable insulating material may be employed. In this way, pre-insulated angular fittings, pre-insulated collectors (1) or other connection components may be manufactured.

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DESCRIPTION

"PRE-INSULATED COMPONENTS"

FIELD OF THE INVENTION

The present invention relates to the file of pre-insulated components for use in heating, air-conditioning and water supply applications.

BACKGROUND OF THE INVENTION

The pre-insulated components of the present invention have not been disclosed in the prior art.

One of the major problems that the installers face in heating, air-conditioning and water supply works is the failure to use pre-insulated components during work. Until now, the insulation are formed locally, on-site, resulting to loss of time, and to an increase in the cost due to the additional working hours for the application of the insulation. Furthermore, in most cases, there are no pre-manufactured pieces that can be used by the installers at the sites where this is required, thereby forcing the installers to adopt tailor-made manufactures for the individual installation. These manufactures include angular components, pipe connection components with various paths or pipe joint components.

A further disadvantage occurring in air-conditioning, heating and water supply installations is the absence of pre-insulated collectors. Collectors constitute important components for the specific installations, since liquefaction phenomena occur thereon. Therefore, frequent maintenance is required on their insulations. The insulation of the collector during installation is a separate work for each installer, since there is no pre-insulated counterpart for immediate installation.

An object of the present invention is to address advantageously the said disadvantages and failures of the prior art, by presenting pre-insulated components with suitable insulating material, which may be directly used in hydraulic installations.

A further object of the present invention is to provide pre-insulated components that may be manufactured from poly(vinyl chloride), also

known as PVC, as well as other polyolefins including polyethylene and polypropylene.

A further object of the present invention is to allow easy union of the special parts used in hydraulic applications, either by the use of an appropriated adhesive or by special tapes.

A further advantageous object of the invention is the perforation of the components for the injection of additional polyurethane by the installers during joining.

A further object of the invention presents a pre-insulated collector with a suitable insulating and swelling material.

A further object of the invention is to provide a pre-insulated collector, from which outputs for the heating, air-conditioning or water supply system are obtained.

These and further objects, features and advantages of the invention will be apparent from the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

The invention will be apparent by those skilled in the art by reference to the accompanying figures, in which the invention is depicted in an exemplary, non-limiting manner.

Figure 1 shows a pre-insulated collector which is used in heating, air-conditioning and cooling applications.

Figure 2 shows a flexible pre-insulated 90°-angle component while Figure 3 shows a respective pre-insulated 45°-component.

Figures 4(a)-(d) show other special pre-insulated components, which may be connected between them by screws, or male-female buttons, or even welded.

Figure 5(a)-(b) shows pre-insulated 45°- and 90°-angles respectively, which are assembled by joining fully dissected parts.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the accompanying figures, illustrative embodiments of the pre-insulated components are described in order to make apparent both their innovation and their technical features.

One of the major issues in the presently available air-conditioning, heating and water supply installations is the use of special components for the various connections between pipes. Given that these are not pre-insulated, there was a need for on-site insulation of the joints by the installers. Especially in collectors, liquefaction occurs on the air-conditioning networks. This means that regular maintenance of the insulations at the specific site is required. A collector (1), Fig. 1, according to the present invention is manufactured by an inner pipe (2) made of a suitable material for water distribution. Such materials include, but not limiting to, polypropylene, polyethylene, polyolefins in general, copper or iron. The outer sheath (4) of the collector (1) consists of a suitable coating material. Again, such materials include exemplarily polypropylene, polyethylene, polyolefins in general, copper or iron. Between the two sheaths the insulation material (3) is arranged. As insulation material polyurethane or any other swellable insulating material may be employed.

In a similar way, special pre-insulated parts for joining pipes at sites where angles are formed may be made. The pre-insulated components may consist of flexible pre-insulated 90°-pipes, Fig. 2, or flexible pre-insulated 45°-pipes, Fig. 3, or even of tailor-made components, e.g. T-shaped ones, Fig. 4(c), wherein the outer sheath (4) is made of materials which are mentioned above and are suitable for uses in heating, air-conditioning and water supply applications. In their interior, the said components may have an insulation made of polyurethane or other suitable insulating material, while they have holes (5) on their outer surface, through which an insulating material may be introduced as required during installation. In each hole (5), a cap is formed after the injection of the insulating material, which covers the hole (5). The insulating material, as it is known in the current state of the art, is swollen to occupy any available space.

In an alternative embodiment of the invention, 45°- and 90°-angular fittings may be manufactured from the pre-insulated pipe parts, Fig. 5(a) and Fig. 5(b), which are cut at 22.5° and 45° respectively and which are connected between them forming the desired angle. Such a joint may be made easily by the installer himself, ensuring the formation of a fully insulated angular connection.

Tailor-made components, Fig. 4(a)-(d), may be connected between them forming essentially modified shapes corresponding to the individual installation requirements. These components have sockets (6) to be screwed between them by screwing. In an alternative embodiment of the invention, these may be made by respective male/female buttons, instead of screws, in order to be connected between them. In a further alternative embodiment of the invention, and in case that the parts are made of polyvinylchloride, these may be connected by welding.

In a further alternative embodiment of the invention, the above-said components may be provided without an inner insulation (3), but the installer may insulate the space between the inner pipe (2) and the outer sheath (4) with the appropriated material through the holes (5).

It should be noted that the description of the invention was made with reference to illustrative, non-limiting, embodiments. Thus, any variation or modification regarding shape, manufacture and assemblage materials and components used, as long as not constituting a new inventive step and not contributing to the technical advance of the already known art, are included in the scope of the present invention.

CLAIMS

1. Pre-insulated components, characterized in that they consist of an inner pipe (2) coated with an insulating material (3) and an outer sheath (4), on which holes (5) are arranged for the injection of a further insulating material.

2. Pre-insulated components, according to claim 1, characterized in that the inner pipe (2) and the outer sheath (4) are made of polyvinylchloride, polypropylene, polyethylene, copper or iron.

3. Pre-insulated components, according to claim 1, characterized in that they are screwed between them via sockets (6).

4. Pre-insulated components, according to claim 1, characterized in that they consist of an inner pipe (2), an outer sheath (4) with holes (5), in which an insulating material (3) is injected during installation.

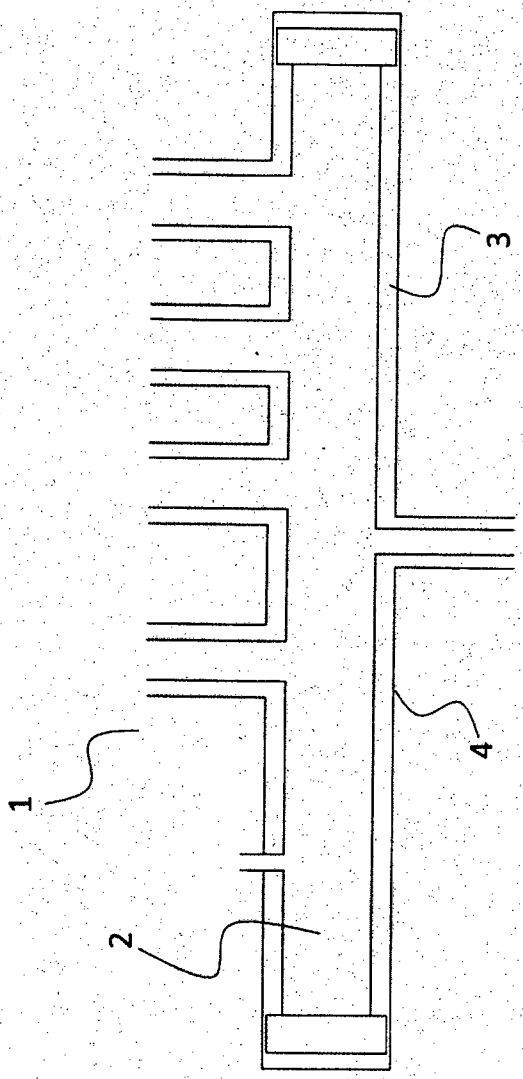


Fig. 1

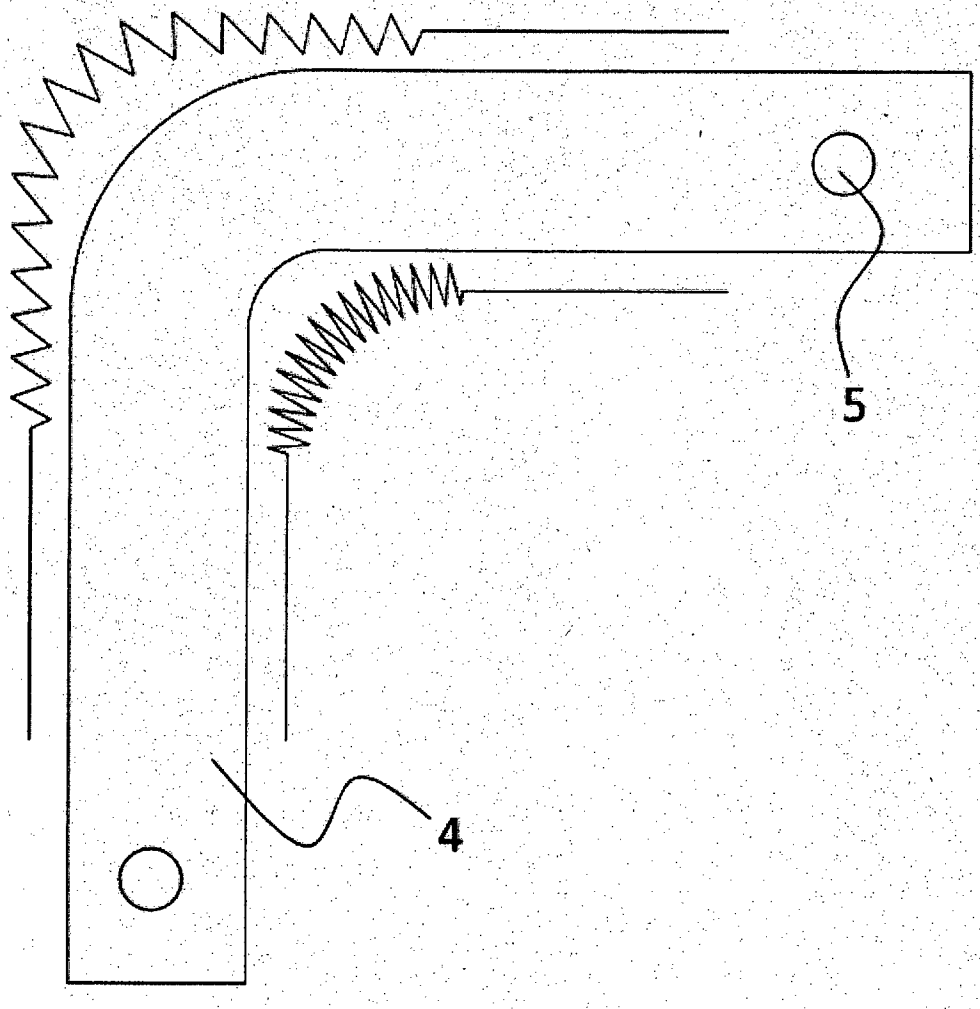


Fig. 2

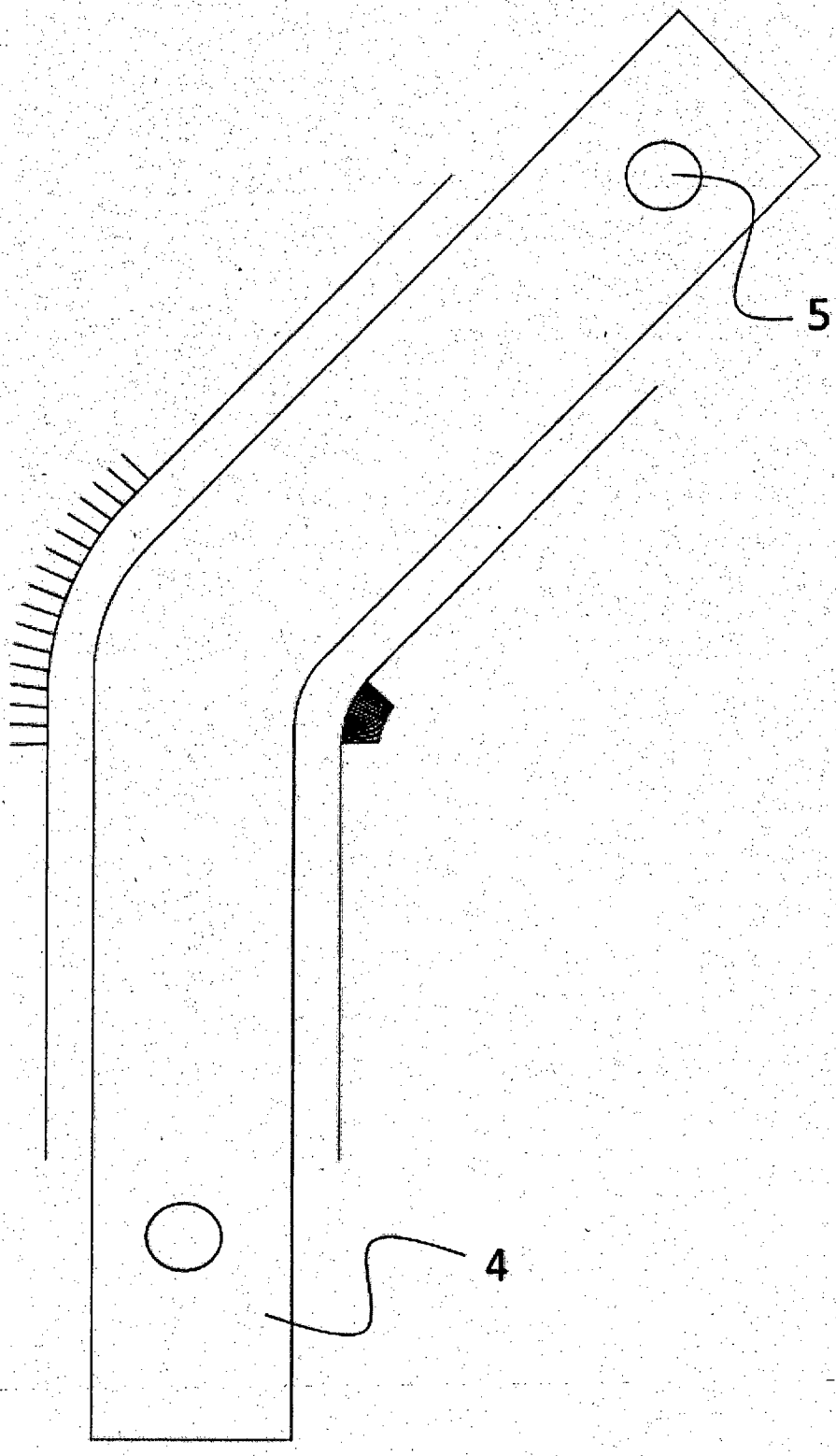
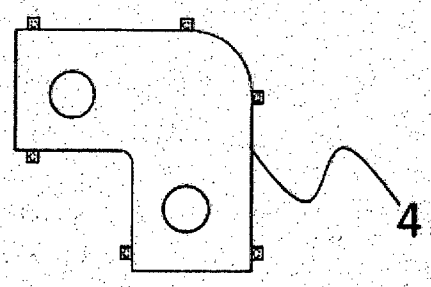
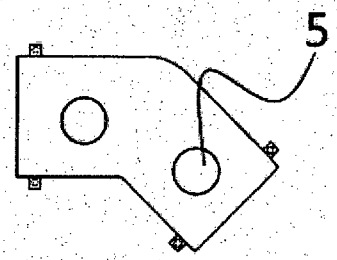


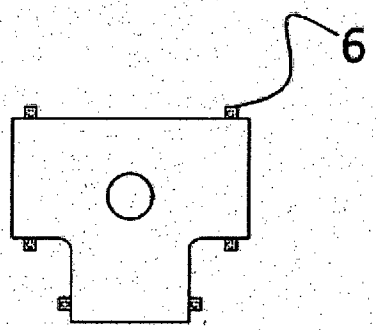
Fig. 3



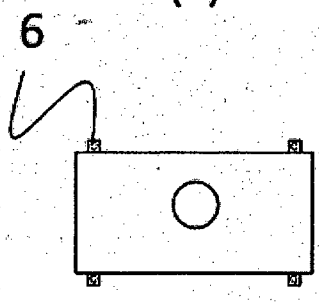
(a)



(b)

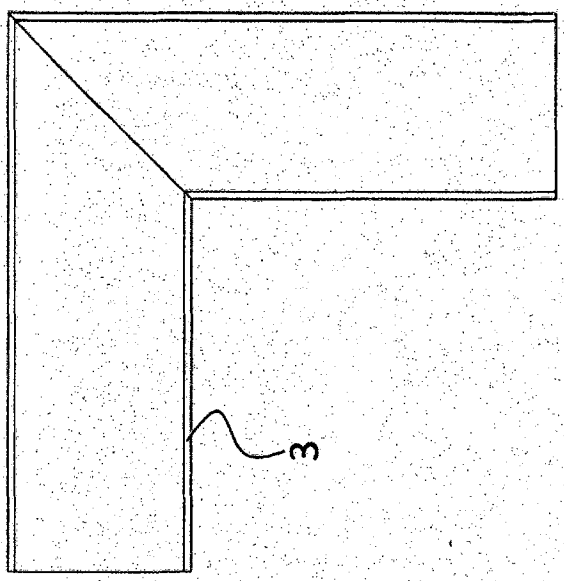


(c)

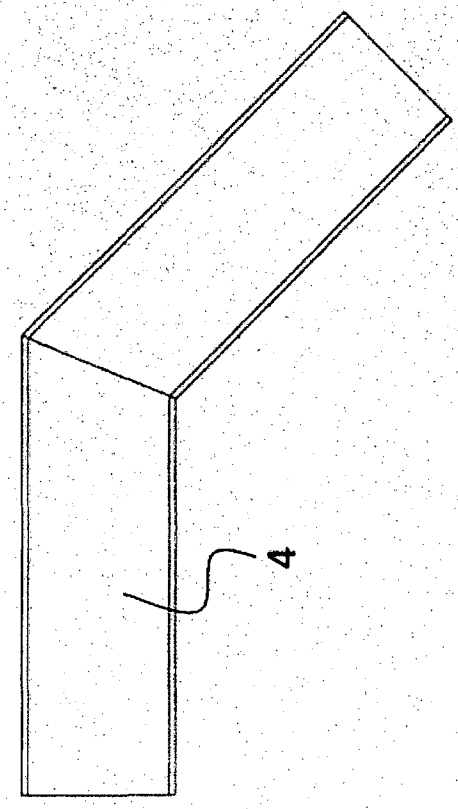


(d)

Fig. 4



(b)



(a)

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/GR2017/000023

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16L59/14 F16L59/16
ADD.

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)
F16L B29C

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 307 590 A (CARLSON CHARLES R) 7 March 1967 (1967-03-07) columns 1,2; figures	1-4
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X	US 2 545 030 A (ISENBERG ALEXANDER H ET AL) 13 March 1951 (1951-03-13) column 2, line 26 - column 3, line 20; figures	1-4

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 July 2017	10/08/2017

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
PCT/GR2017/000023

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 988 050 A1 (OBSCHESTVO S OGRANICHENNOY OTVETSTVENNOSTIYU SMIT YARTSEVO [RU]) 24 February 2016 (2016-02-24) abstract; figures paragraphs [0028] - [0049]	1-4
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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