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**DECLARATION OF TRANSLATOR
AND CERTIFICATION OF TRANSLATION**

Translation: From Chinese to English

Original Document: CN102435332 A

I, SHAUN WU, hereby declare as follows:

1. My name is SHAUN WU, and I am a professional translator of Chinese and English for Transperfect, having a headquarters at 1250 Broadway, 6th Floor, New York, NY 10001. My address is 3380 Twilight Dr., Cincinnati, OH 45241.

2. I am fluent in Chinese and English.

3. I translated the document identified and attached as CN102435332 A (Exhibit A, the "Original Document") from Chinese to English.

4. A true and correct copy of the Original Document is attached as Exhibit A, and a true and correct copy of my translation (the "Translation") is attached to this Declaration as Exhibit B.

5. The Translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English.

6. All statements herein made of my own knowledge are true, and that all statements herein made on information and belief are believed to be true.

7. The statements made herein were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

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EXHIBIT A



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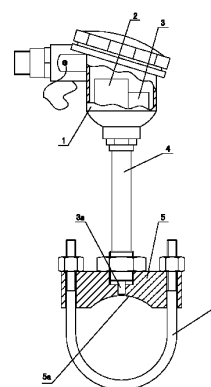
权利要求书 1 页 说明书 2 页 附图 2 页

(54) 发明名称

管道温度测量装置

(57) 摘要

管道温度测量装置,壳体内装有温度传感器和温度数据处理装置,温度传感器和温度数据处理装置相接,壳体的底端连接有支撑杆,温度传感器的感温探头位于支撑杆的下端,支撑杆的下端部联接有导热底座,温度传感器的感温探头嵌装在导热底座内,在导热底座上联接有卡箍。将导热底座与卡箍包围在管道外部,通过导热底座与卡箍的联接,使本温度测量装置固定在管道上,由感温探头即可获得管道外表的温度,通过温度传感器即可得出管道外表的温度数据,通过数据处理装置对温度数据采集、补偿、处理,即可准确得出管道内部液体、气体的温度实际值。



1. 管道温度测量装置,壳体内装有温度传感器和温度数据处理装置,温度传感器和温度数据处理装置相接,壳体的底端连接有支撑杆,温度传感器的感温探头位于支撑杆的下端,其特征在于:支撑杆的下端部联接有导热底座,温度传感器的感温探头嵌装在导热底座内,在导热底座上联接有卡箍。

2. 根据权利要求1所述的管道温度测量装置,其特征在于:导热底座底端的中部为凹陷的圆柱面,卡箍呈U形,卡箍与导热底座间为螺纹联接。

管道温度测量装置

技术领域

[0001] 本发明涉及温度测量装置，具体地说是一种用于测量管道温度的装置。

背景技术

[0002] 在石油、化工、物业行业等供热、液体、气体输送管道上，需要对管道里输送液体、气体的温度进行检测。特别是高温、高压、防爆场合，更需要实时监测温度变化。目前对管道里输送液体、气体的温度进行检测的手段为：1、在输送液体或气体的管道上，动用电钻、电焊等方式开孔焊接盲管，使用温度计进行人工读取温度值；2、在液体、气体输送的管道上焊接安装附件，然后将温度传感器固定在安装附件上，上述两种手段分别存在的不足是：对于前者，使用温度计测量，需要人工读取、记录，数据记录不够及时、误差较大，工作方法原始；对于后者，在管道上动电、火焊接，安装方法复杂，施工繁琐，成本高，在高压、防爆危险场合不允许动火电焊，安装更难、更危险。

发明内容

[0003] 本发明的目的在于提供一种管道温度测量装置，该温度测量装置可方便快捷地安装在管道上，且在安装中不需动电、动火。

[0004] 为实现上述目的，本发明采用以下方案：管道温度测量装置，壳体内装有温度传感器和温度数据处理装置，温度传感器和温度数据处理装置相接，壳体的底端连接有支撑杆，温度传感器的感温探头位于支撑杆的下端，支撑杆的下端部联接有导热底座，温度传感器的感温探头嵌装在导热底座内，在导热底座上联接有卡箍。

[0005] 由上述方案可见，将导热底座与卡箍包围在管道外部，通过导热底座与卡箍的联接，使本温度测量装置固定在管道上，由感温探头即可获得管道外表的温度，通过温度传感器即可得出管道外表的温度数据，通过温度数据处理装置对温度数据采集、补偿、处理，即可准确得出管道内部液体或气体的温度实际值。

[0006] 本发明提供的提供的管道温度测量装置具有安装方便、快捷、测试准确、使用寿命长的特点。

附图说明

[0007] 图 1 为本发明实施例一的结构图；

图 1 为本发明实施例二的结构图。

具体实施方式

[0008] 以下结合实施例及附图进一步说明本发明。

[0009] 参见图 1

本发明提供的管道温度测量装置的壳体 1 内装有温度传感器 3 和温度数据处理装置 2，温度传感器 3 和温度数据处理装置 2 相接。壳体 1 的底端连接有支撑杆 4，温度传感器的感

温探头 3a 位于支撑杆 4 的下端。以上与现有技术相同。支撑杆 4 的下端部联接有导热底座 5, 温度传感器 3 的感温探头 3a 嵌装在导热底座 5 内, 在导热底座 5 上联接有卡箍 6。导热底座 5 底端的中部为凹陷的圆柱面 5a, 卡箍 6 呈 U 形, 卡箍 6 与导热底座 5 间为螺纹联接。导热底座 5 的材质采用导热性较好的金属如铝或铜等。

[0010] 本实施例中的温度数据处理装置可以为数字显示的也可以是具无线传输功能的。

[0011] 参见图 2

本实施例中, 支撑杆 4 上连接的为现有的一种太阳能无线温度测试装置 7, 通过将太阳能无线温度测试装置 7 与导热底座 5、卡箍 6 联接, 构成管道温度控制装置。本实施例中, 支撑杆 4、导热底座 5、卡箍 6 及导热底座 5 内所设的温度传感器的感温探头的结构与实施例一相同。

[0012] 由图 1、图 2 可见, 将导热底座 5 与卡箍 6 包围在管道外部, 通过两者的联接, 使本温度测量装置固定在管道上, 由感温探头 3a 即可获得管道外表的温度, 通过温度传感器即可得出管道外表的温度数据, 通过温度数据处理装置 2 对温度数据采集、补偿、处理或传输, 即可准确得出管道内部液体或气体的温度实际值。本发明适用于石油、化工领域及物业供热等输送液体、气体的管道上。

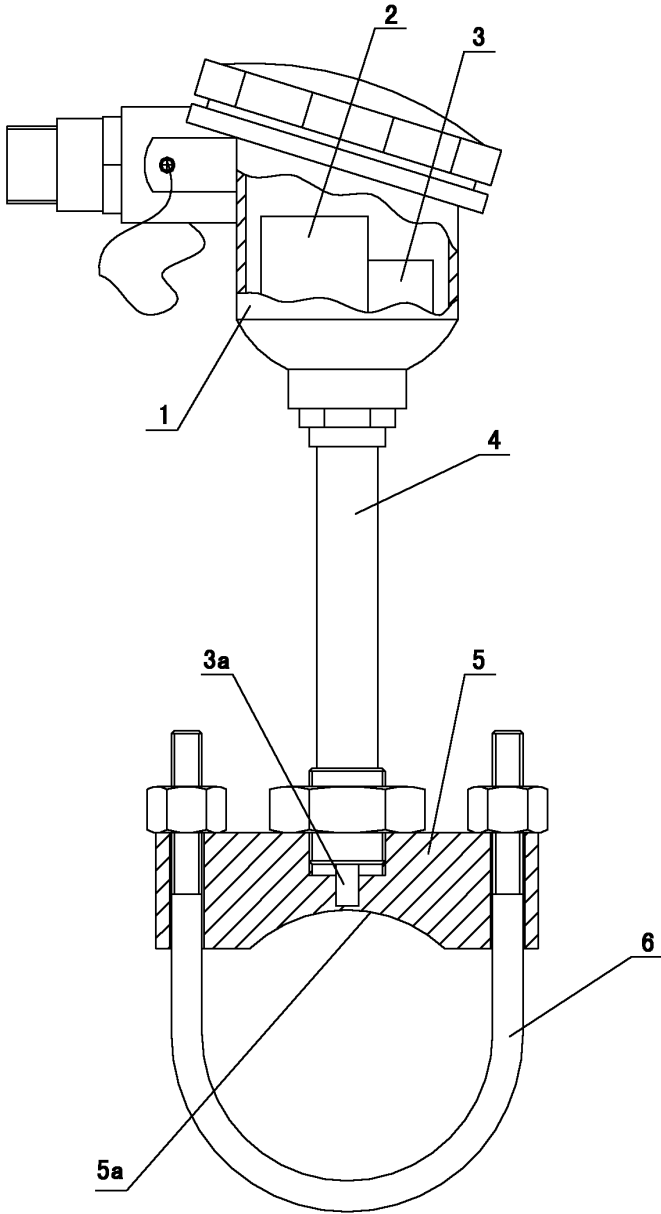


图 1

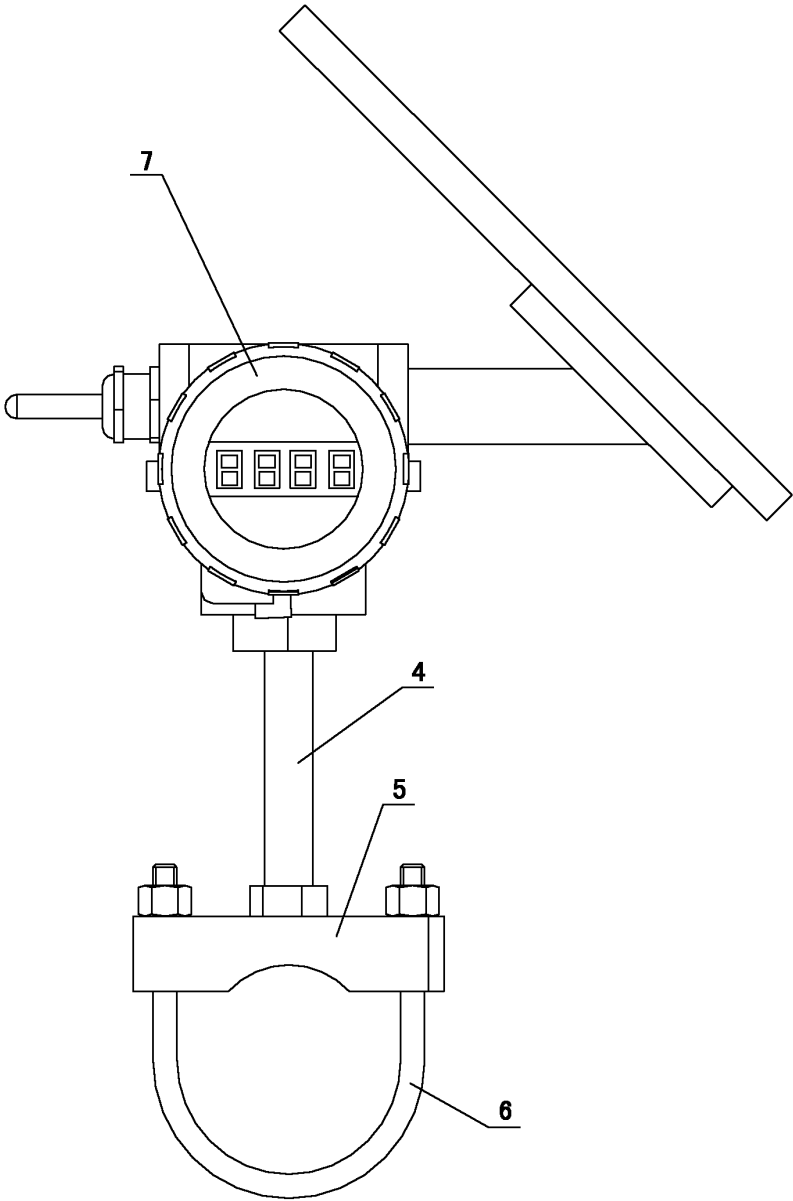


图 2

EXHIBIT B



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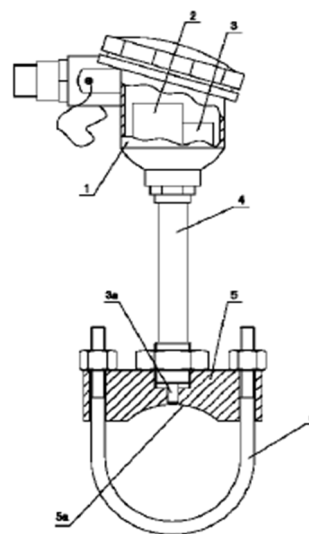
Claims 1 Page Specification 2 Pages
Drawings 2 Pages

(54) Title of Invention

Pipe temperature measurement device

(57) Abstract

A pipe temperature measurement device, with a temperature transducer and a temperature data processing device contained in a shell, the temperature transducer and temperature data processing device are connected to each other, the bottom of the shell is connected to a supporting pole, a temperature-sensing probe of the temperature transducer is located at the lower end of the supporting pole, which is linked to a heat conduction base, and the temperature-sensing probe of the temperature transducer is embedded in the heat conduction base, which is linked to a clamp. With the heat conduction base and clamp surrounding the exterior of the pipe and the linkage of the heat conduction base and clamp, the temperature measurement device is fixed on the pipe, the temperature-sensing probe obtains the temperature of the outer surface of the pipe, the temperature transducer obtains temperature data of the outer surface of the pipe, and the actual temperature value of liquid and gas in the pipe is accurately obtained after the temperature data processing device acquires, compensates, and processes temperature data.



1. A pipe temperature measurement device, with a temperature transducer and a temperature data processing device contained in a shell, the temperature transducer and temperature data processing device are connected to each other, the bottom of the shell is connected to a supporting pole, a temperature-sensing probe of the temperature transducer is located at the lower end of the supporting pole, wherein the lower end of the supporting pole is linked to a heat conduction base, and the temperature-sensing probe of the temperature transducer is embedded in the heat conduction base, which is linked to a clamp.

2. The pipe temperature measurement device according to Claim 1, wherein the middle portion of the bottom of the heat conduction base is a concave cylindrical surface, the clamp is U-shaped, and the clamp and heat conduction base are linked by a screw thread.

Pipe Temperature Measurement Device

Technical Field

[0001] The present disclosure relates to a temperature measurement device, particularly a device for measuring pipe temperature.

Background Art

[0002] The temperature of liquid and gas transported in heating supply, liquid and gas transport pipes in the petroleum, chemistry, and property industries, etc. need to be tested. In particular, real-time temperature changes need to be monitored in high-temperature, high-pressure, and explosion-proof places. Current means for testing the temperature of liquid and gas transported in pipes include: 1. using drills, welding, and other methods to open holes and weld blind pipes that transport liquid or gas, and using a thermometer to manually read temperature values; 2. welding and installing accessories on liquid and gas transport pipes, then fixing the temperature transducer on the installed accessory. The respective shortcomings of the two above means are: for the former, manual reading, recording, and data recording required for thermometer measurement are not timely, have large errors, and the operating method is primitive; for the latter, electric and fire welding of the pipe and the installation method are complex, it is cumbersome to perform, high-cost, and fire welding is not allowed at dangerous high-pressure and explosion-proof places. Hence, installation is more difficult and dangerous.

Summary of the Invention

[0003] The purpose of the present disclosure is to provide a pipe temperature measurement device, which may be easily and efficiently installed on the pipe without requiring electricity and fire in installation.

[0004] The present disclosure employs the following solution to achieve the above purpose. a pipe temperature measurement device, with a temperature transducer and a temperature data processing device contained in a shell, the temperature transducer and temperature data processing device are connected to each other, the bottom of the shell is connected to a supporting pole, a temperature-sensing probe of the temperature transducer is located at the lower end of the supporting pole, which is linked to a heat conduction base, and the temperature-sensing probe of the temperature transducer is embedded in the heat conduction base, which is linked to a clamp.

[0005] It can be seen from the above solution that with the heat conduction base and clamp surrounding the exterior of the pipe and the linkage of the heat conduction base and clamp, the temperature measurement device is fixed on the pipe, the temperature-sensing probe obtains the temperature of the outer surface of the pipe, the temperature transducer obtains temperature data of the outer surface of the pipe, and the actual temperature value of liquid and gas in the pipe is accurately obtained after the temperature data processing device acquires, compensates, and processes the temperature data.

[0006] The pipe temperature measurement device provided by the present disclosure has the features of being easy to install, efficient, having accurate test results and a long service lifespan.

Brief Description of Drawings

[0007] Fig. 1 is a structure chart of Example 1 of the present disclosure;

Fig. 2 is a structure chart of Example 2 of the present disclosure.

Specific Embodiments

[0008] The present disclosure will be further described with the examples and figures.

[0009] Refer to Fig. 1

The pipe temperature device provided by the present disclosure comprises a shell 1, which contains a temperature transducer 3 and a temperature data processing device 2, and the temperature transducer 3 and temperature data processing device 2 are connected to each other.

The bottom of the shell 1 is connected to a supporting pole 4 and the temperature-sensing probe 3a of the temperature transducer is located at the lower end of the supporting pole 4. The above is the same as prior art. The lower end of the supporting pole 4 is linked to a heat conduction base 5, and the temperature-sensing probe 3a of the temperature transducer 3 is embedded in the heat conduction base 5, which is linked to a clamp 6. The middle portion of the bottom of the heat conduction base 5 is a concave cylindrical surface 5a, the clamp 6 is U-shaped, and the clamp 6 and heat conduction base 5 are linked by a screw thread. The heat conduction base 5 is made with a metal with relatively good thermal conductivity, such as aluminum or copper.

[0010] The temperature data processing device in the example may be a digital display and may also have a wireless transmission function.

[0011] Refer to Fig. 2

In this example, the supporting pole 4 is connected to an existing solar wireless temperature testing device 7, and the pipe temperature control device is constituted by linking the solar wireless temperature testing device 7, the heat conduction base 5, and the clamp 6. In this example, the structure of the supporting pole 4, heat conduction base 5, clamp 6, and temperature-sensing probe in the temperature transducer disposed in the heat conduction base 5 is the same as that in Example 1.

[0012] It can be seen in Fig. 1 and Fig. 2 that with the heat conduction base 5 and clamp 6 surrounding the exterior of the pipe and the linkage between the two, the temperature measurement device is fixed on the pipe, the temperature-sensing probe 3a obtains the temperature of the outer surface of the pipe, the temperature transducer obtains temperature data of the outer surface of the pipe, and the actual temperature value of liquid and gas in the pipe is accurately obtained after the temperature data processing device 2 acquires, compensates, and processes the temperature data. The present disclosure is applicable to heating supply and other liquid and gas transport pipes in the petroleum, chemical, and property fields.

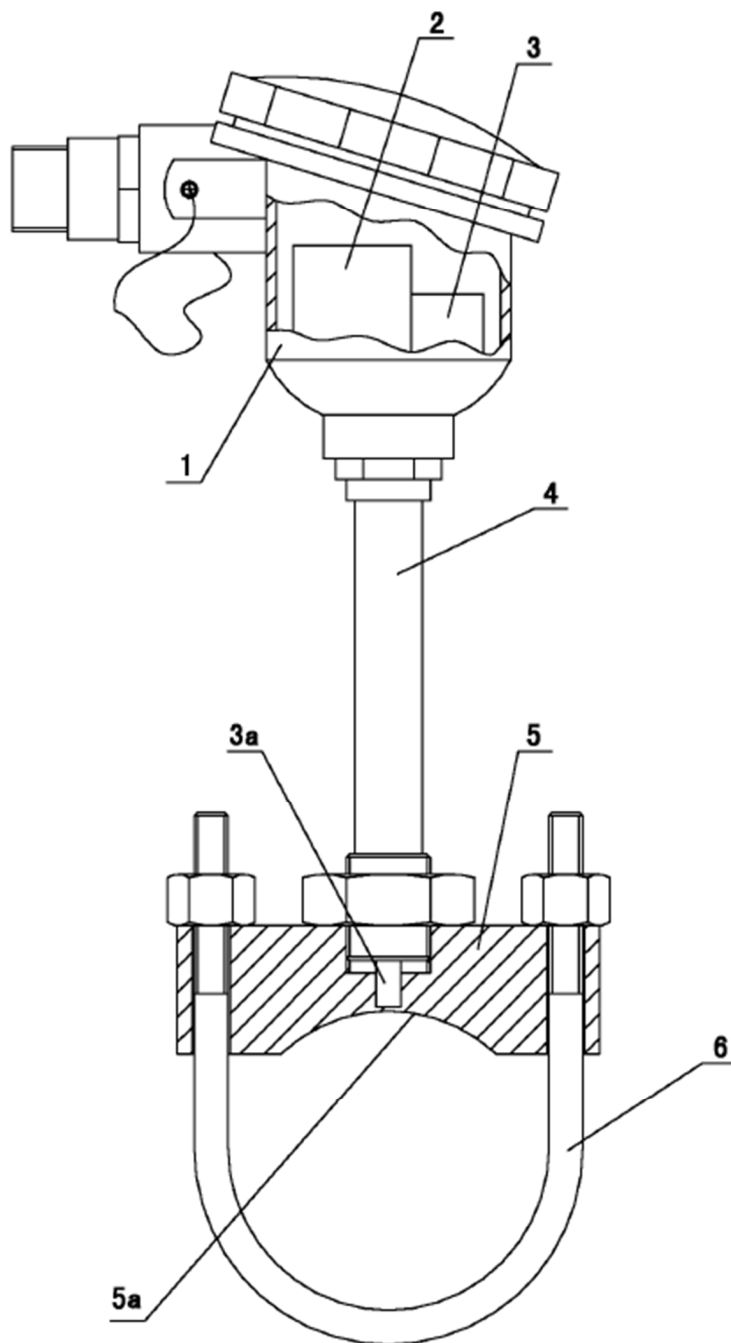


Fig. 1

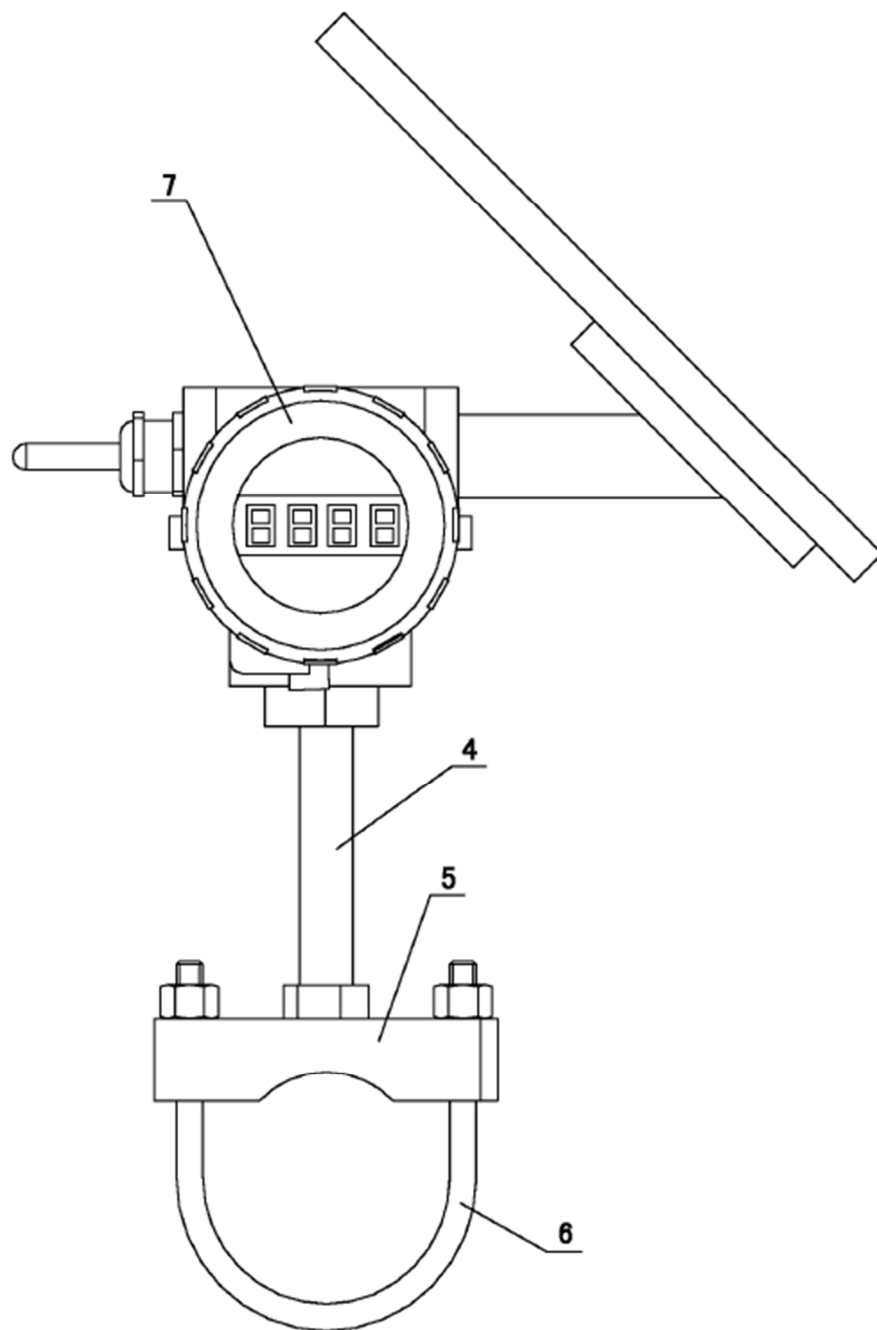


Fig. 2