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(54) **UTILITY POLE**

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(57) **ABSTRACT**

An object of the present disclosure is to provide a utility pole capable of supplying rainwater to residents.  
The present disclosure is a utility pole including: a cylindrical structure that has one end opened and another end closed; and a water draining mechanism that discharges water inside the cylindrical structure on a side surface on a side of the other end.

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{4}

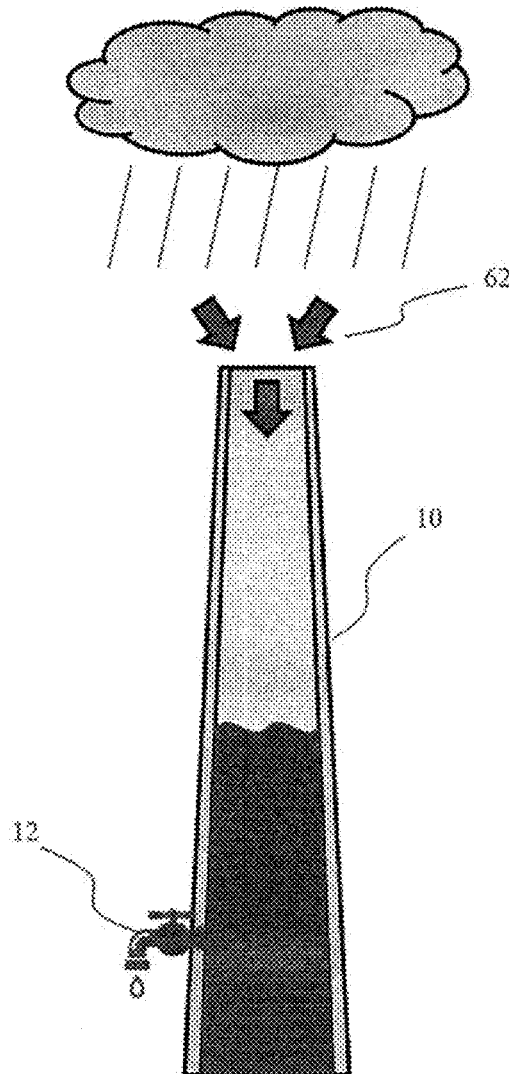


Fig. 1-1

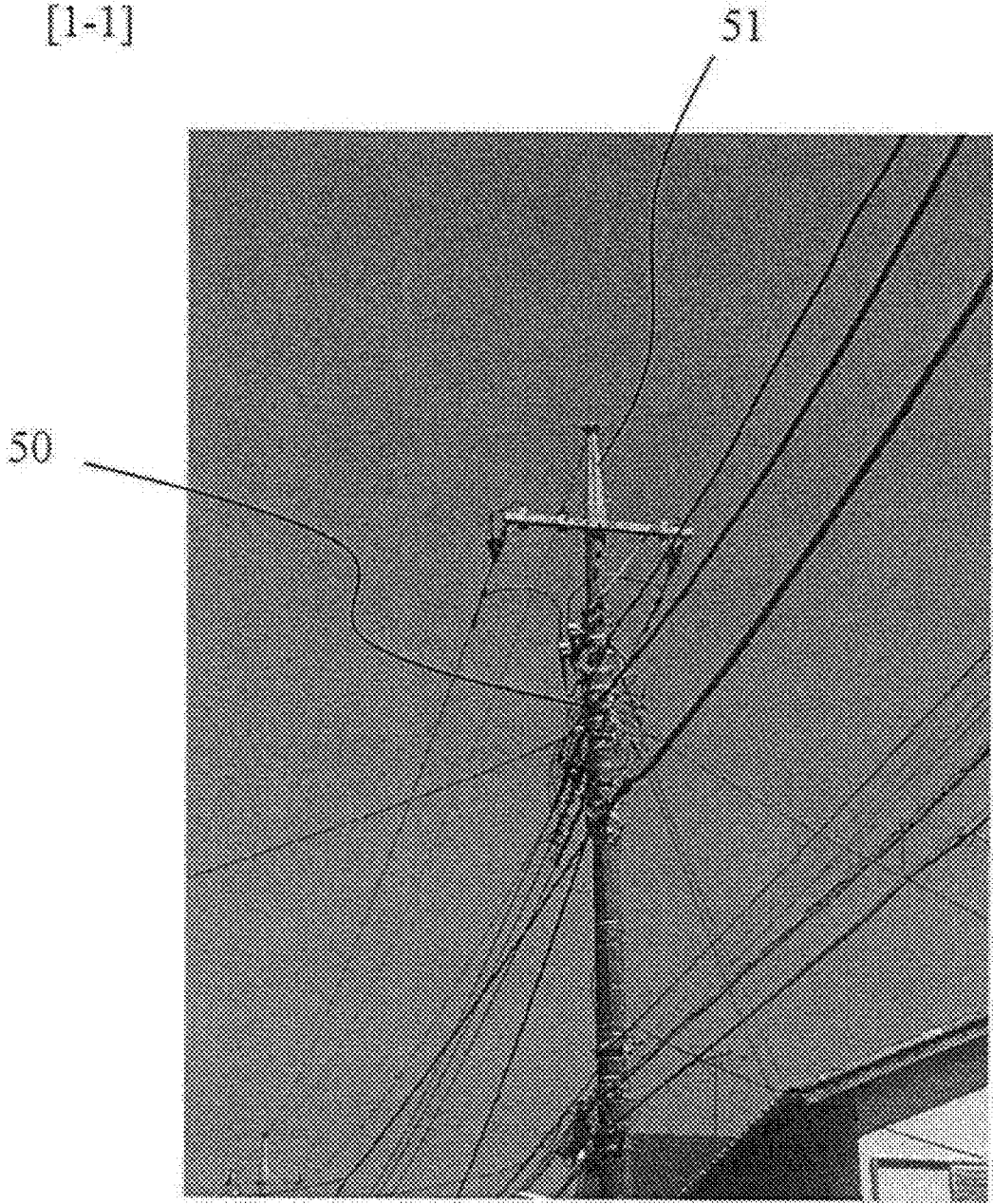
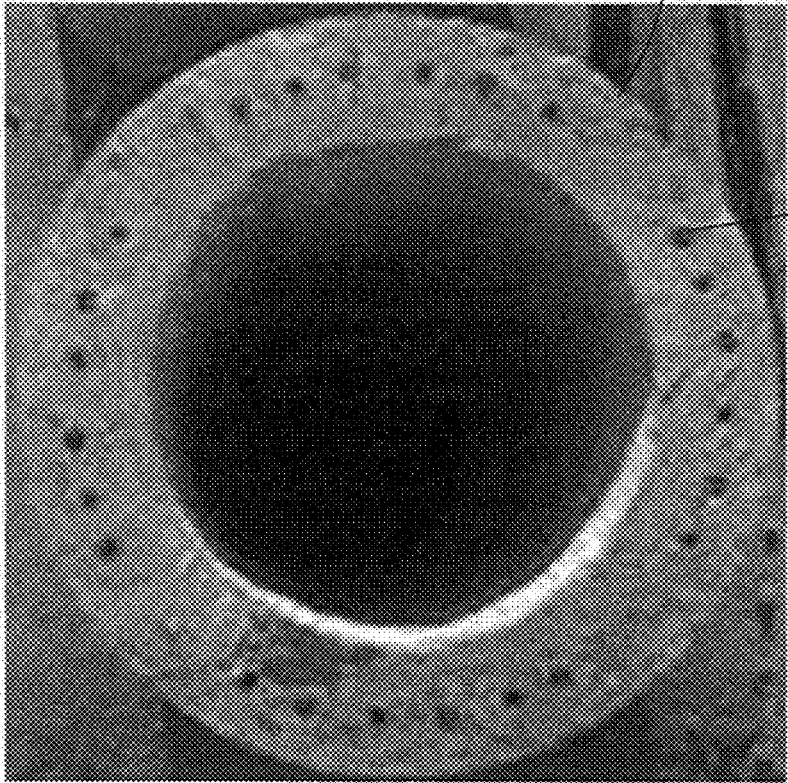


Fig. 1-2

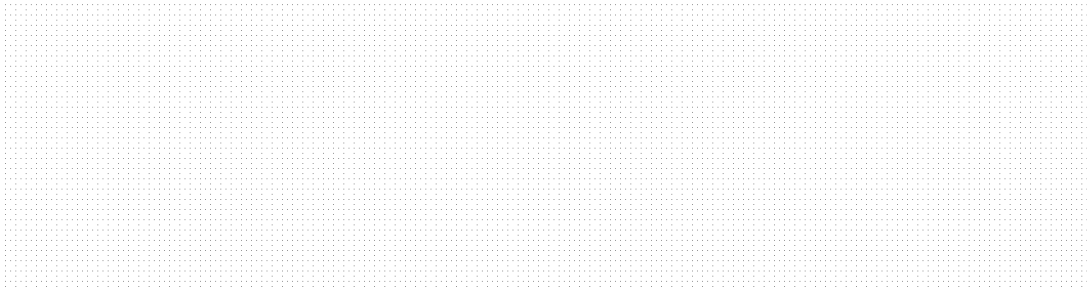
[1-2]

50 52

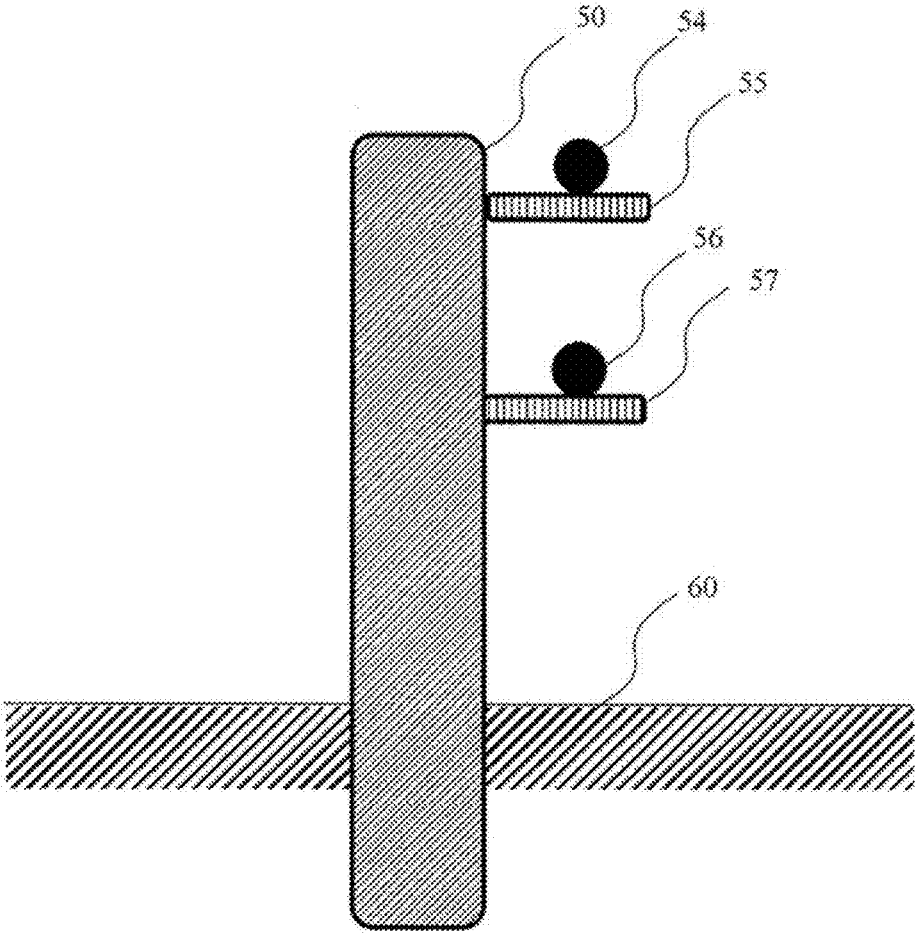


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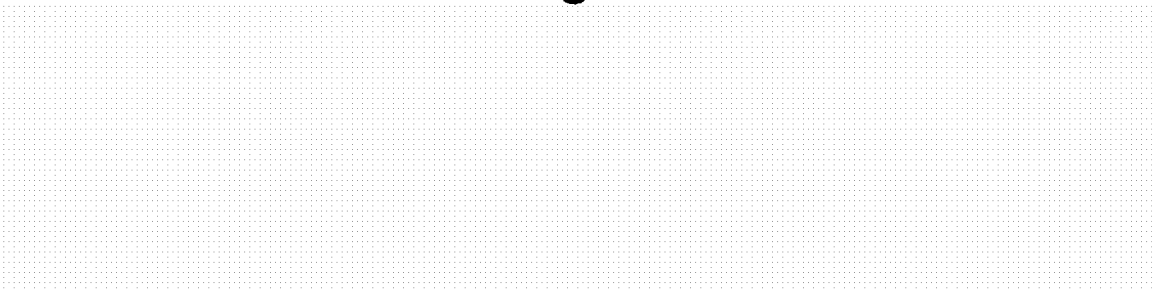
Fig. 2



[2]



**Fig. 3**



[3]

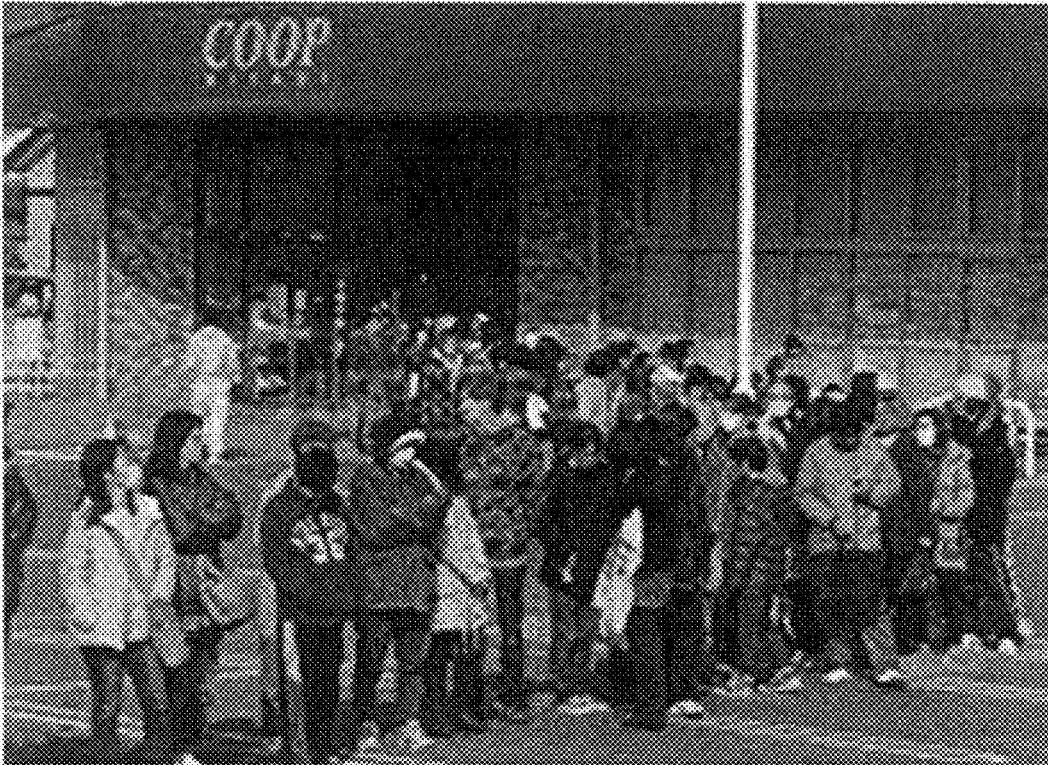


Fig. 4

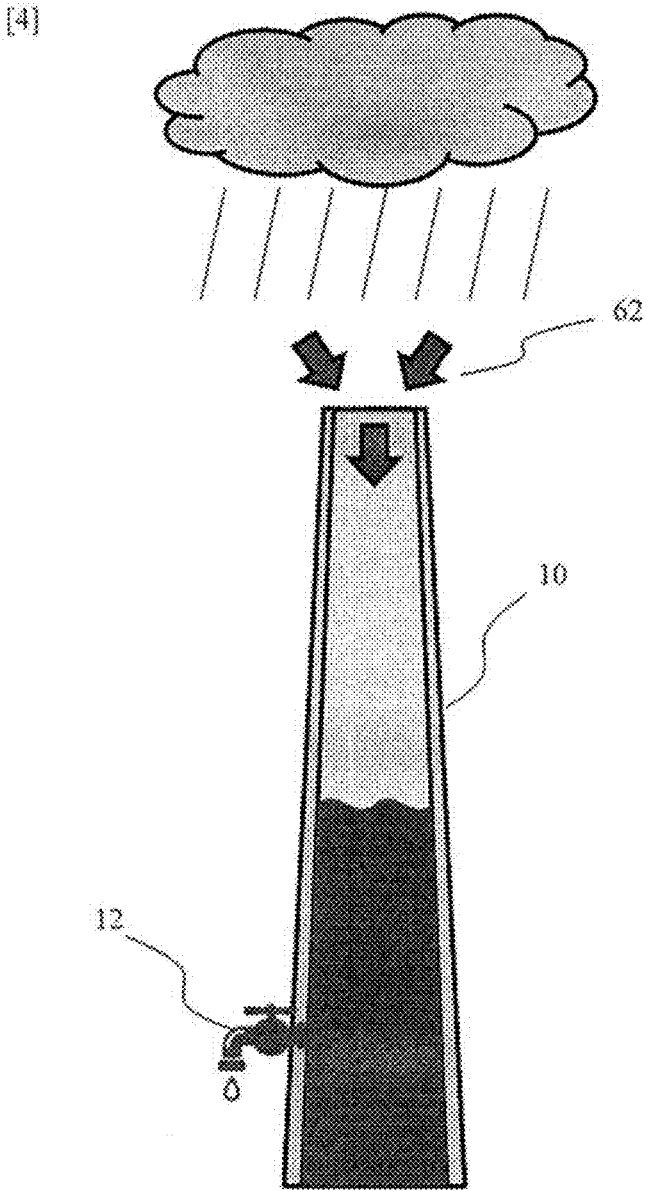


Fig. 5

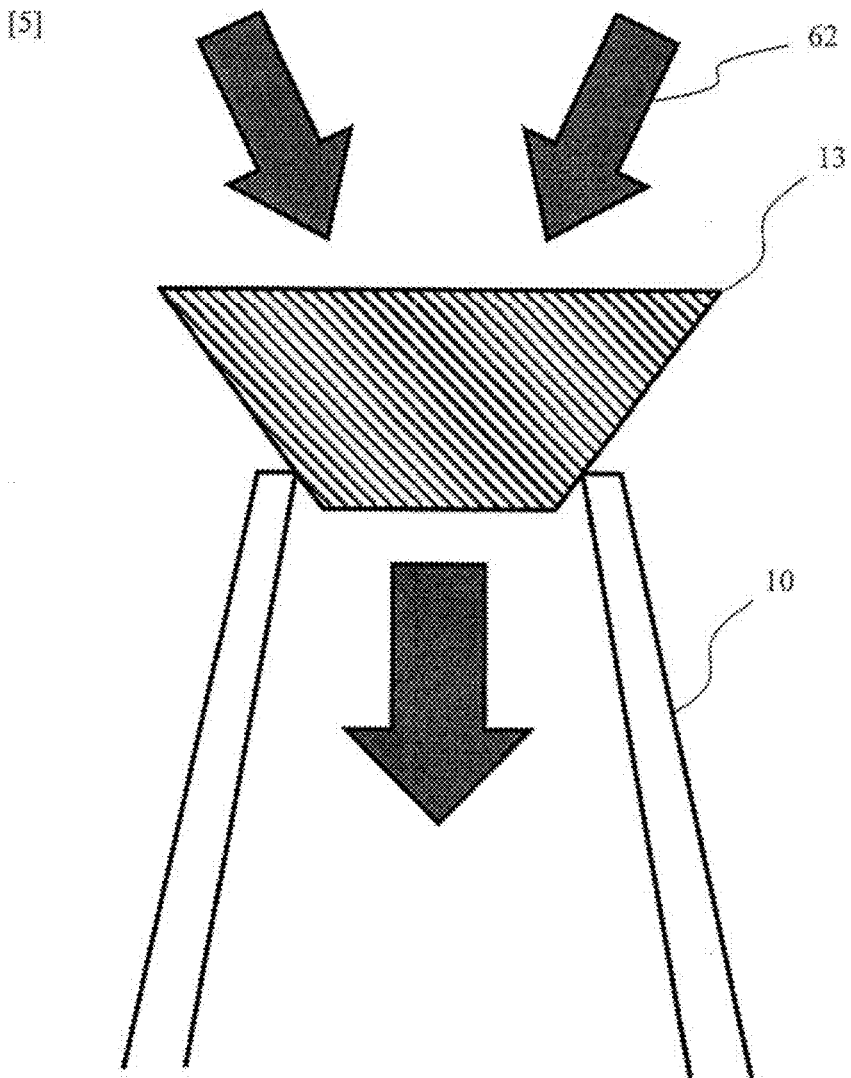


Fig. 6

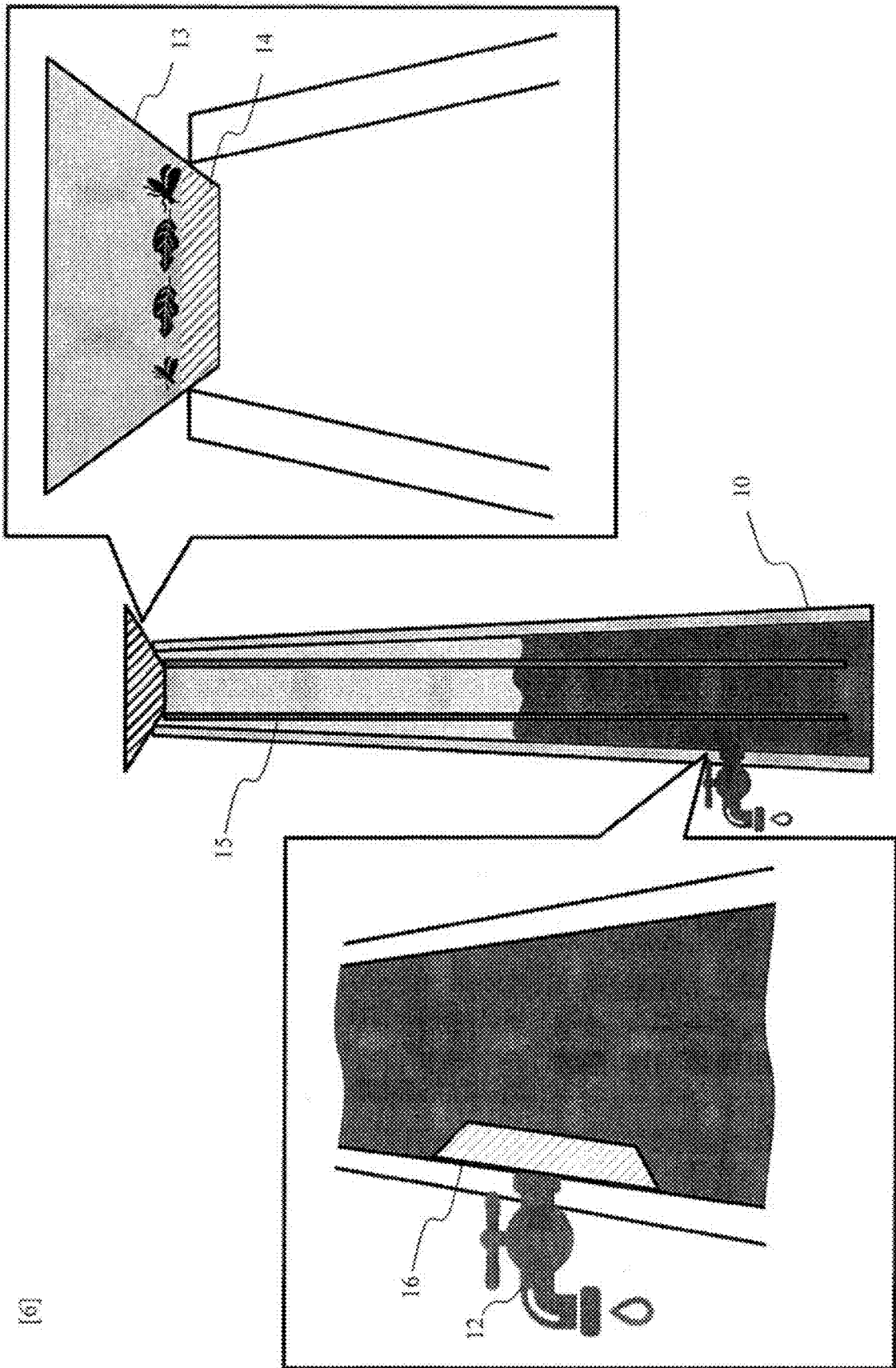
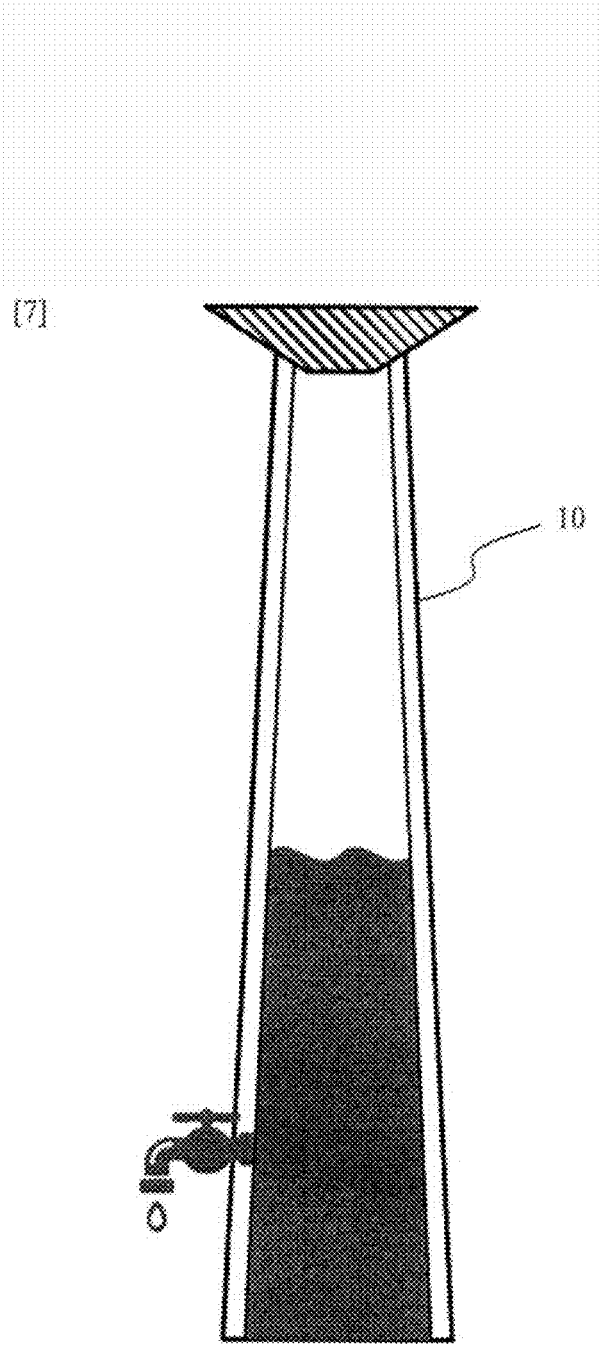


Fig. 7



## UTILITY POLE

### TECHNICAL FIELD

[0001] The present invention relates to a utility pole to which a communication cable or a power cable is attached.

### BACKGROUND ART

[0002] There are mainly three types of utility poles: concrete poles, iron poles, and wooden poles. Currently, concrete poles are mainly used, but there are also a certain number of iron poles and wooden poles depending on places and the like (see, for example, Non Patent Literature 1). Concrete poles, which are most commonly used, include concrete and reinforcing bars. A photograph of a currently used utility pole is illustrated in FIG. 1-1. As illustrated in FIG. 1-1, one end of a utility pole 50 is protected by a cap 51. A cross-sectional diagram of the utility pole is illustrated in FIG. 1-2. As illustrated in FIG. 1-2, the utility pole 50 has a cylindrical structure, and the cylindrical structure is mainly made of concrete 52 and reinforced by reinforcing bars 53.

[0003] When the utility pole is erected, an embedment depth of  $\frac{1}{2}$  or more of the total length is secured in the case of 15 m or less with respect to the total length, and an embedment depth of 2.5 m or more is secured when the total length exceeds 15 m (see, for example, Non Patent Literature 2). FIG. 2 illustrates an erected utility pole. A large number of power cables and communication cables are attached to the tip of the utility pole protruding from the ground surface. These cables are not directly attached to the utility pole, but are attached via a metal member called power cable hardware or communication cable hardware. 30 million or more such utility poles are installed across the country (see, for example, Non Patent Literature 3).

### CITATION LIST

#### Non Patent Literature

- [0004] Non Patent Literature 1: The Ministry of Economy, Trade and Industry, Regarding Individual Issues, 5-2. Regarding Technical Standard Review of Utility Poles, P. 31, [https://www.meti.go.jp/shingikai/sankoshin/hoan\\_shohi/denryoku\\_anzen/tettou/pdf/004\\_02\\_00.pdf](https://www.meti.go.jp/shingikai/sankoshin/hoan_shohi/denryoku_anzen/tettou/pdf/004_02_00.pdf)
- [0005] Non Patent Literature 2: Yasui Denki Koji K. K., Kenichi YASUI's blog, Embedment Depth (Embedment Length) of Utility Pole, <http://yasui-denki.dream-blog.jp/blog/135.html>
- [0006] Non Patent Literature 3: Specified Non-Profit Organization, The Network for Non Pole Community, the Number of Utility Poles in Japan, <https://nponpc.net/whatisnonpole/%E6%97%A5%E6%9C%AC%E3%81%AE%E9%9B%B0%E6%9F%B1%E3%81%AE%E6%95%B0/>

### SUMMARY OF INVENTION

#### Technical Problem

[0007] In recent years, large typhoons and earthquakes frequently occur. Once a natural disaster occurs and communication services and power services are stopped in the region, it takes a lot of time for these social infrastructures to recover.

[0008] Water is most important for human life. It is apparent from the experience of natural disasters occurring

thus far that sufficient water cannot be obtained when natural disasters occur. Furthermore, in an area with a large population such as an urban area, when water supply is stopped, people go to a nearby supermarket or convenience store to buy water, but the water is quickly sold out. FIG. 3 is a photograph describing a situation at the time of disaster. At the time of disaster, as illustrated in FIG. 3, a line for items is formed. There is a problem that if the arrival of a water supply vehicle is delayed, sufficient water cannot be supplied in an emergency.

[0009] Therefore, an object of the present disclosure is to provide a utility pole capable of supplying rainwater to residents.

#### Solution to Problem

[0010] The utility pole of the present disclosure has a water storage function inside the cylindrical structure, and includes a water draining mechanism for stored water.

[0011] Specifically, the utility pole of the present disclosure includes a cylindrical structure having one end opened and the other end closed, and a water draining mechanism that discharges water inside the cylindrical structure on a side surface on a side of the other end.

[0012] Specifically, the utility pole of the present disclosure in which at least a part of the cylindrical structure is transparent.

[0013] Specifically, the utility pole of the present disclosure includes a tapered mechanism having a cylindrical shape having an open end wider than one end of the cylindrical structure at the one end.

[0014] Specifically, the utility pole of the present disclosure includes a filtration filter that blocks passage of a solid material at the one end.

[0015] Specifically, the utility pole of the present disclosure includes a heating element in an internal space of the cylindrical structure.

[0016] Specifically, the utility pole of the present disclosure in which the water draining mechanism includes a purification device that purifies water to be discharged.

#### Advantageous Effects of Invention

[0017] According to the present disclosure, it is possible to provide a utility pole capable of supplying rainwater to residents.

### BRIEF DESCRIPTION OF DRAWINGS

[0018] FIG. 1-1 is a photograph of a utility pole used.

[0019] FIG. 1-2 is a cross-sectional diagram of a utility pole used.

[0020] FIG. 2 is a diagram describing an erected utility pole.

[0021] FIG. 3 is a photograph describing a situation at the time of disaster.

[0022] FIG. 4 is a diagram describing a structure of the utility pole of the present disclosure.

[0023] FIG. 5 is a diagram describing a structure of a utility pole capable of efficiently storing water.

[0024] FIG. 6 is a diagram describing a structure of a utility pole capable of supplying water hygienically.

[0025] FIG. 7 is a diagram describing a structure of a utility pole capable of checking an internal water storage amount.

## DESCRIPTION OF EMBODIMENTS

**[0026]** Embodiments of the present disclosure will be described in detail below with reference to the drawings. Note that the present disclosure is not limited to the embodiments described below. These embodiments are merely an example, and the present disclosure can be carried out in forms with various modifications and improvements on the basis of knowledge of those skilled in the art. Note that components having the same reference numerals in the present specification and the drawings indicate the same components.

## First Embodiment

**[0027]** 30 million or more utility poles are installed across the country, and the distance between the utility poles is approximately 30 m. A system capable of storing water is provided to the utility poles. FIG. 4 illustrates a structure of a utility pole having a water storage function. In FIG. 4, reference numeral 10 denotes a utility pole, reference numeral 12 denotes a water draining mechanism, and reference numeral 62 denotes rainwater.

**[0028]** An upper portion of a normal utility pole is covered with a cap. One end of the utility pole 10 having a cylindrical structure is opened without attaching the cap, and the rainwater 62 can be guided from the upper portion of the utility pole 10. The other end of the utility pole 10 on the ground surface side is closed. With this structure, when it rains, the rainwater 62 enters the inside of the utility pole 10 and can be stored inside the utility pole 10. As the rainwater 62, rain may be directly guided to the inside of the utility pole 10, or those stored in anything may be guided to the inside of the utility pole 10.

**[0029]** The water draining mechanism 12 is provided on a side surface on the side of the other end of the utility pole 10. The water draining mechanism 12 discharges water stored inside the utility pole 10. An example of the water draining mechanism 12 is a water faucet. When water is required, water inside the utility pole 10 can be taken out by turning the faucet.

**[0030]** With the utility pole having the structure described above, rainwater can be provided to the residents in an emergency.

## Second Embodiment

**[0031]** FIG. 5 illustrates a structure capable of efficiently storing water inside the utility pole 10. In FIG. 5, reference numeral 10 denotes a utility pole, reference numeral 13 denotes a tapered mechanism, and reference numeral 62 denotes rainwater.

**[0032]** Since one end of the utility pole 10 is tapered, it is difficult for rain to enter. Therefore, the tapered mechanism 13 having a cylindrical shape may be provided at one end of the utility pole 10. When one end of the tapered mechanism 13 is an open end and is wider than the one end of the utility pole 10, that is, in the case of an inverse tapered shape, rain can be efficiently collected.

**[0033]** With the utility pole having the structure described above, water can be efficiently stored inside the utility pole 10.

## Third Embodiment

**[0034]** FIG. 6 illustrates a structure capable of hygienically storing water inside the utility pole 10 and hygienically supplying water. In FIG. 6, reference numeral 10 denotes a utility pole, reference numeral 12 denotes a water draining mechanism, reference numeral 13 denotes a tapered mechanism, reference numeral 14 denotes a filtration filter, reference numeral 15 denotes heating wires, and reference numeral 16 denotes a purification device.

**[0035]** Since the utility pole 10 is installed outdoors, it is necessary to take measures in terms of hygiene when supplying water. As illustrated in FIG. 6, the filtration filter 14 that blocks passage of a solid material may be provided at one end of the utility pole 10. The tapered mechanism 13 may include the filtration filter 14 that blocks passage of a solid material. The filtration filter 14 prevents animals and insects from entering the inside of the utility pole.

**[0036]** A heating element may be provided in the internal space of the utility pole 10. As illustrated in FIG. 6, the heating wires 15 such as nichrome wires can be exemplified as the heating element. It is sufficient if the heating element can heat stored water, and any form may be used as long as it generates heat. By applying an electric current from the outside to heat the water, the stored water can be disinfected.

**[0037]** As illustrated in FIG. 6, the water draining mechanism 12 may include the purification device 16 that purifies water to be discharged. By providing the purification device 16, clean water can be discharged.

**[0038]** With the utility pole having the structure described above, it is possible to hygienically store water inside the utility pole 10 and discharge the water.

## Fourth Embodiment

**[0039]** The utility pole 10 may have a structure capable of checking an internal water storage amount. FIG. 7 illustrates a structure in which the water storage amount inside the utility pole 10 can be checked. In FIG. 7, reference numeral 10 denotes a utility pole. The inside of a typical utility pole cannot be seen from the outside. Therefore, it is difficult to check the water storage amount. Thus, at least a part of the utility pole 10 is made transparent. In order to make at least a part transparent, a part is made of acrylic, glass, or the like. Through the transparent portion, the internal water storage amount can be visually observed. The entire utility pole 10 may be transparent.

**[0040]** The transparent portion may have a window shape or a shape of a plurality of windows. When a transparent window is provided at a predetermined height, it is possible to visually check whether water is stored up to the predetermined height.

**[0041]** As described above, the utility pole of the present disclosure can provide the residents with water in an emergency.

## INDUSTRIAL APPLICABILITY

**[0042]** The present disclosure can be applied to information and communication industries.

## REFERENCE SIGNS LIST

- [0043]** 10 Utility pole
- [0044]** 12 Water draining mechanism
- [0045]** 13 Tapered mechanism

- [0046] 14 Filtration filter
- [0047] 15 Heating wire
- [0048] 16 Purification device
- [0049] 50 Utility pole
- [0050] 51 Cap
- [0051] 52 Concrete
- [0052] 53 Reinforcing bar
- [0053] 54 Power cable
- [0054] 55 Power cable hardware
- [0055] 56 Communication cable
- [0056] 57 Communication cable hardware
- [0057] 60 Ground surface
- [0058] 62 Rainwater

1. A utility pole comprising:  
a cylindrical structure that has one end opened and another end closed; and  
a water draining mechanism that discharges water inside the cylindrical structure on a side surface on a side of the other end.

2. The utility pole according to claim 1, wherein at least a part of the cylindrical structure is transparent.

3. The utility pole according to claim 1, comprising:  
a tapered mechanism having a cylindrical shape having an open end wider than one end of the cylindrical structure at the one end.

4. The utility pole according to claim 1, comprising:  
a filtration filter that blocks passage of a solid material at the one end.

5. The utility pole according to claim 1, comprising:  
a heating element in an internal space of the cylindrical structure.

6. The utility pole according to claim 1, wherein the water draining mechanism includes a purification device that purifies water to be discharged.

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