

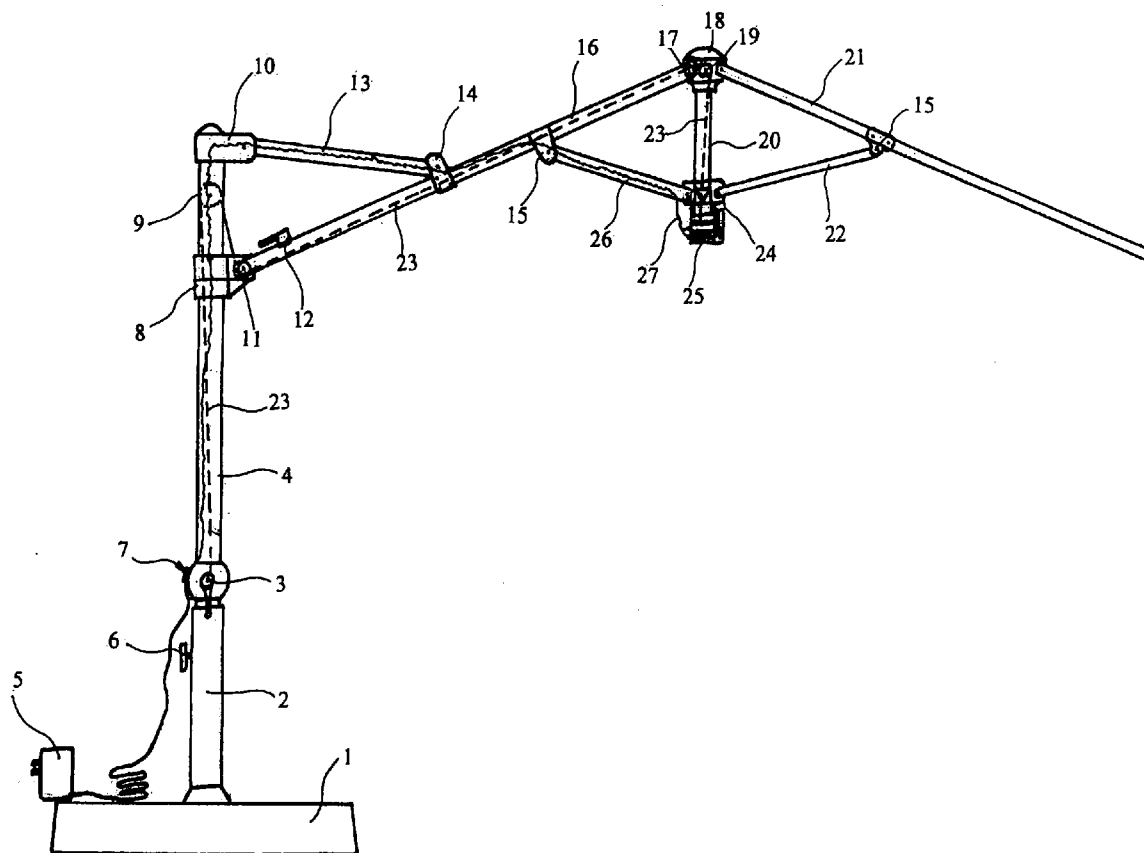


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(57) **ABSTRACT**

An electrical stand poling umbrella comprises a stand pole, a sliding seat, a suspending arm, a pulling arm, a frame and a drive mechanism. The frame includes a fixed joint mounted at a top of a central rod, a movable joint mounted at a bottom of the central rod, and multiple upper ribs and lower ribs. The drive mechanism includes an electromotor, a rope axle linked to the electromotor by a gear assembly, and a rope having a first end fastened on the rope axle. The drive mechanism is installed in the movable joint. The rope has a second end extending in turn through the frame, the suspending arm, and the pulley and is fastened on the stand pole. The electromotor is electrically connected with a power supply by a wire. The drive mechanism will not be dampened in rainy days. The stand pole has an enough strength for long usage life. In addition, the electromotor has a lower output power and is highly efficient. A hand crank is provided on the stand pole for manual operation.



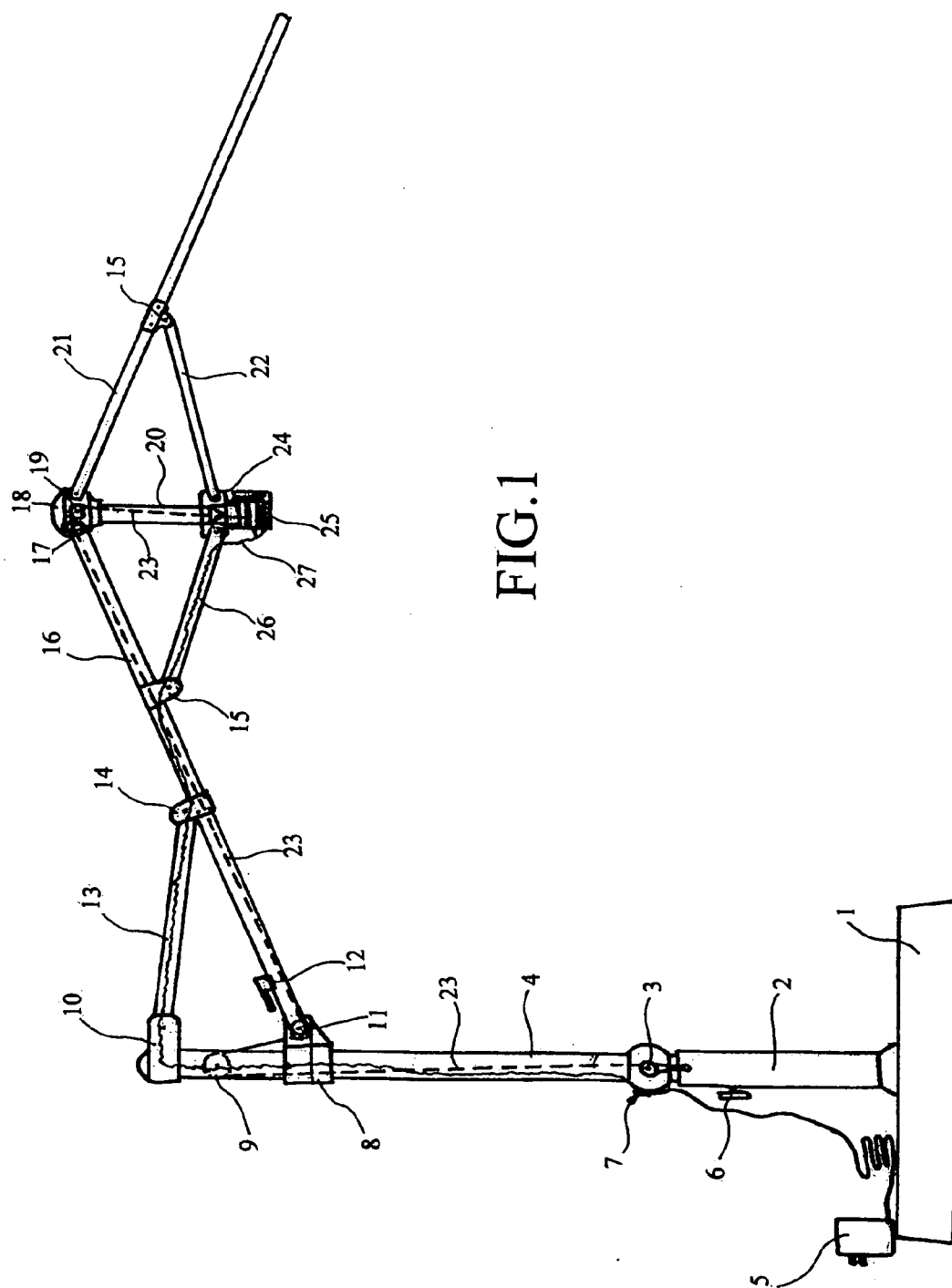


FIG.1

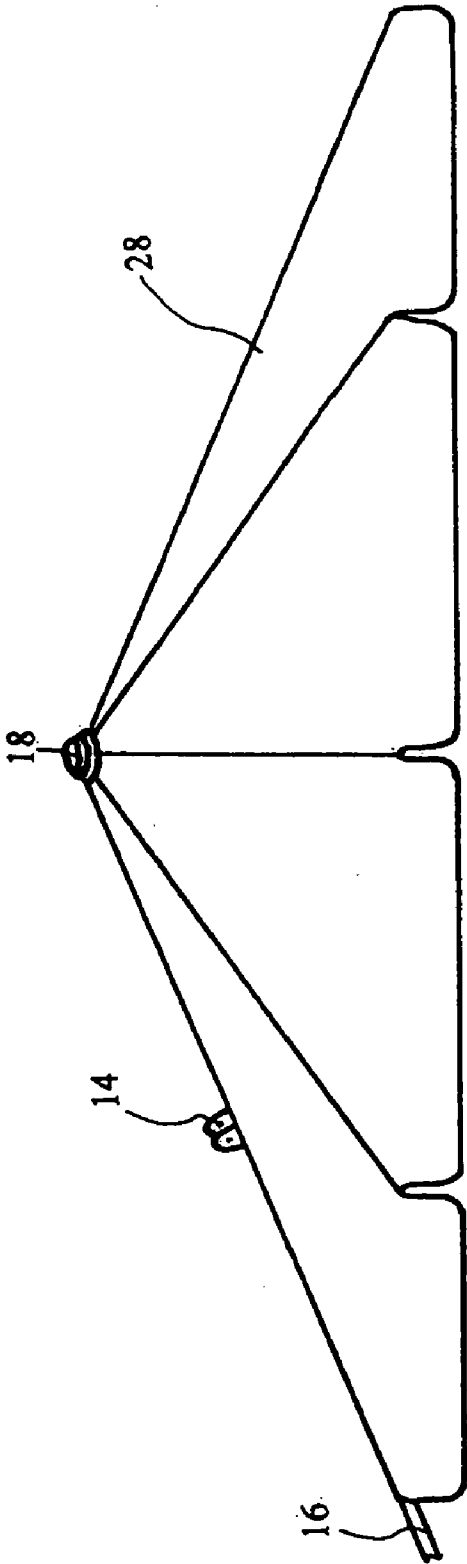


FIG.2

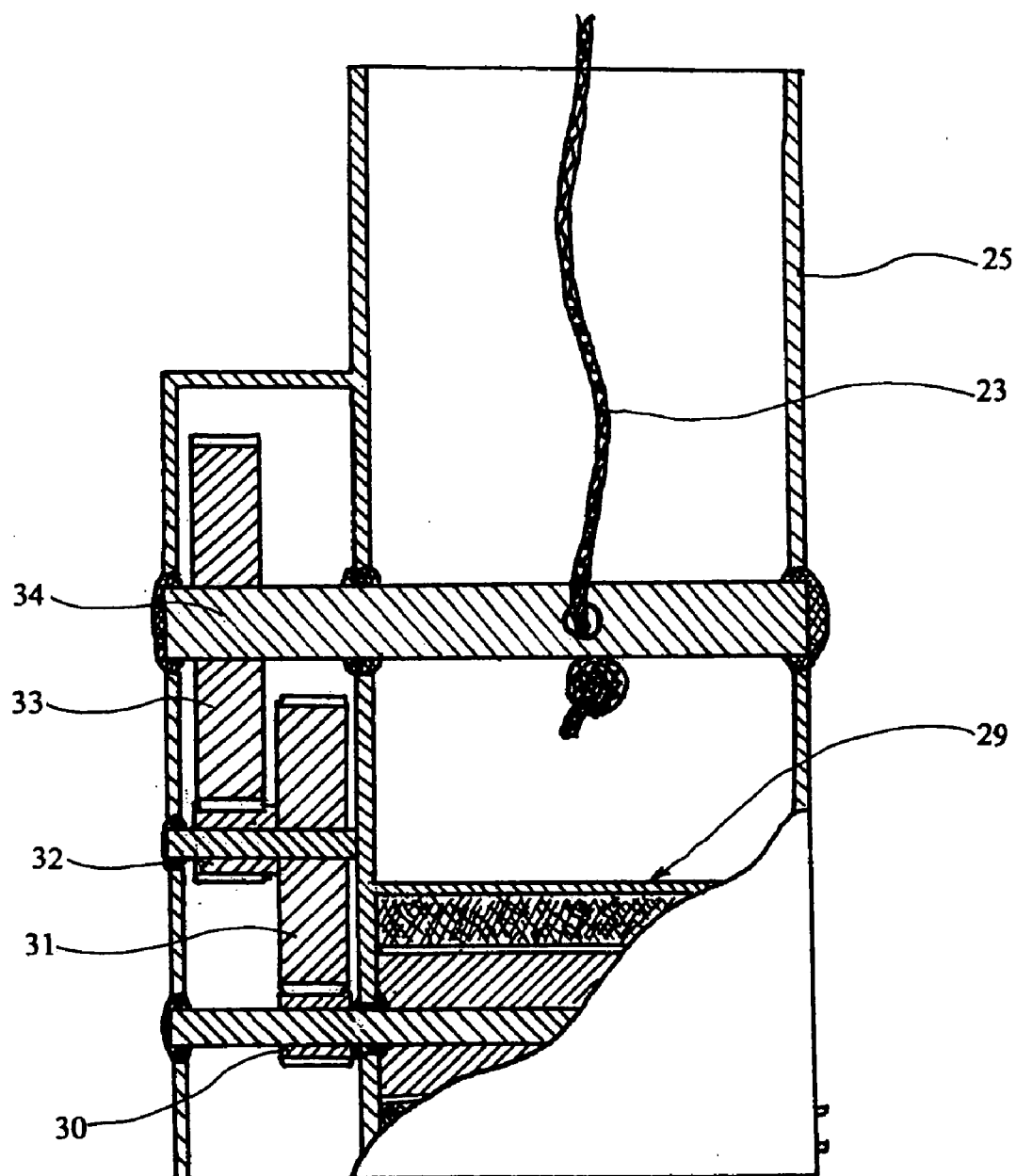
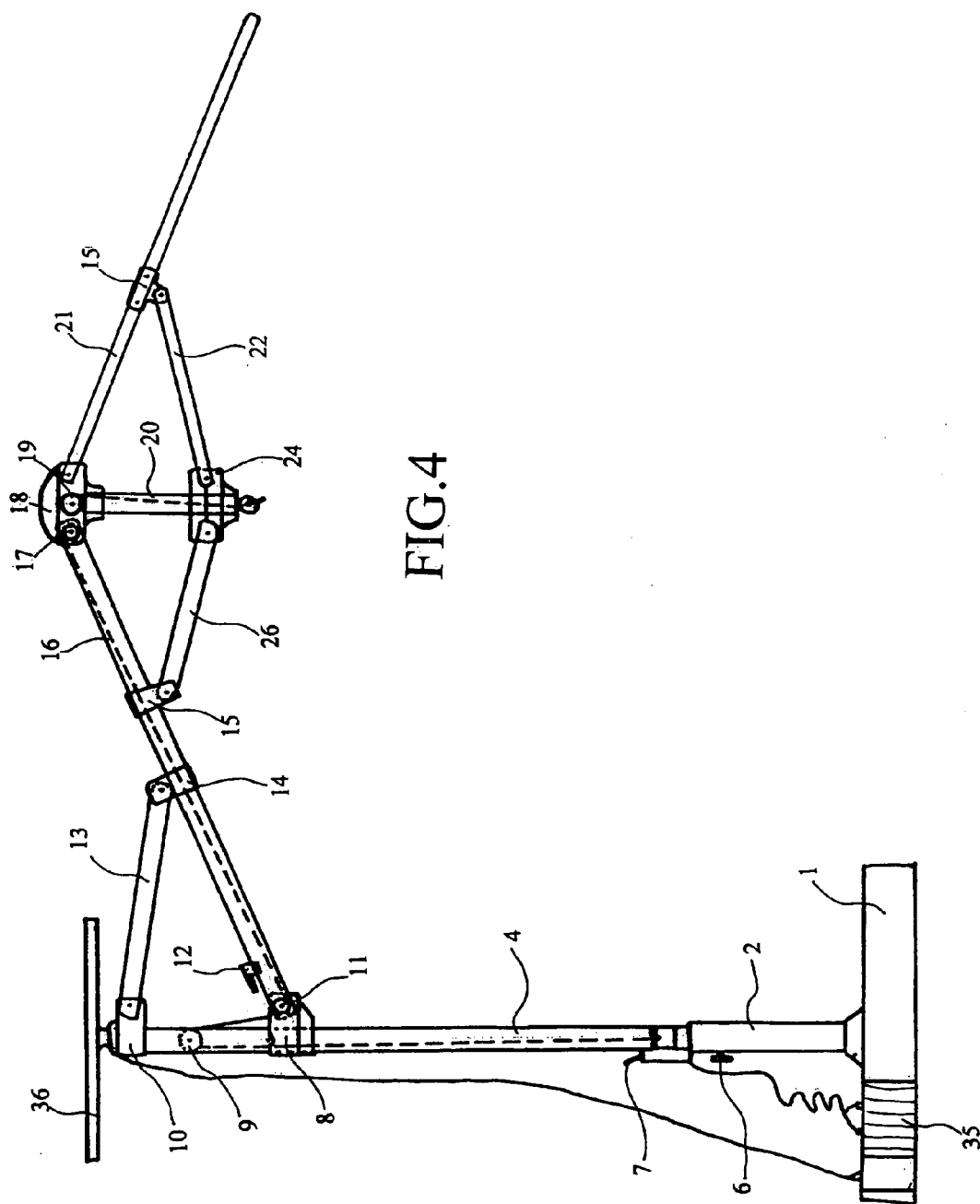


FIG.3



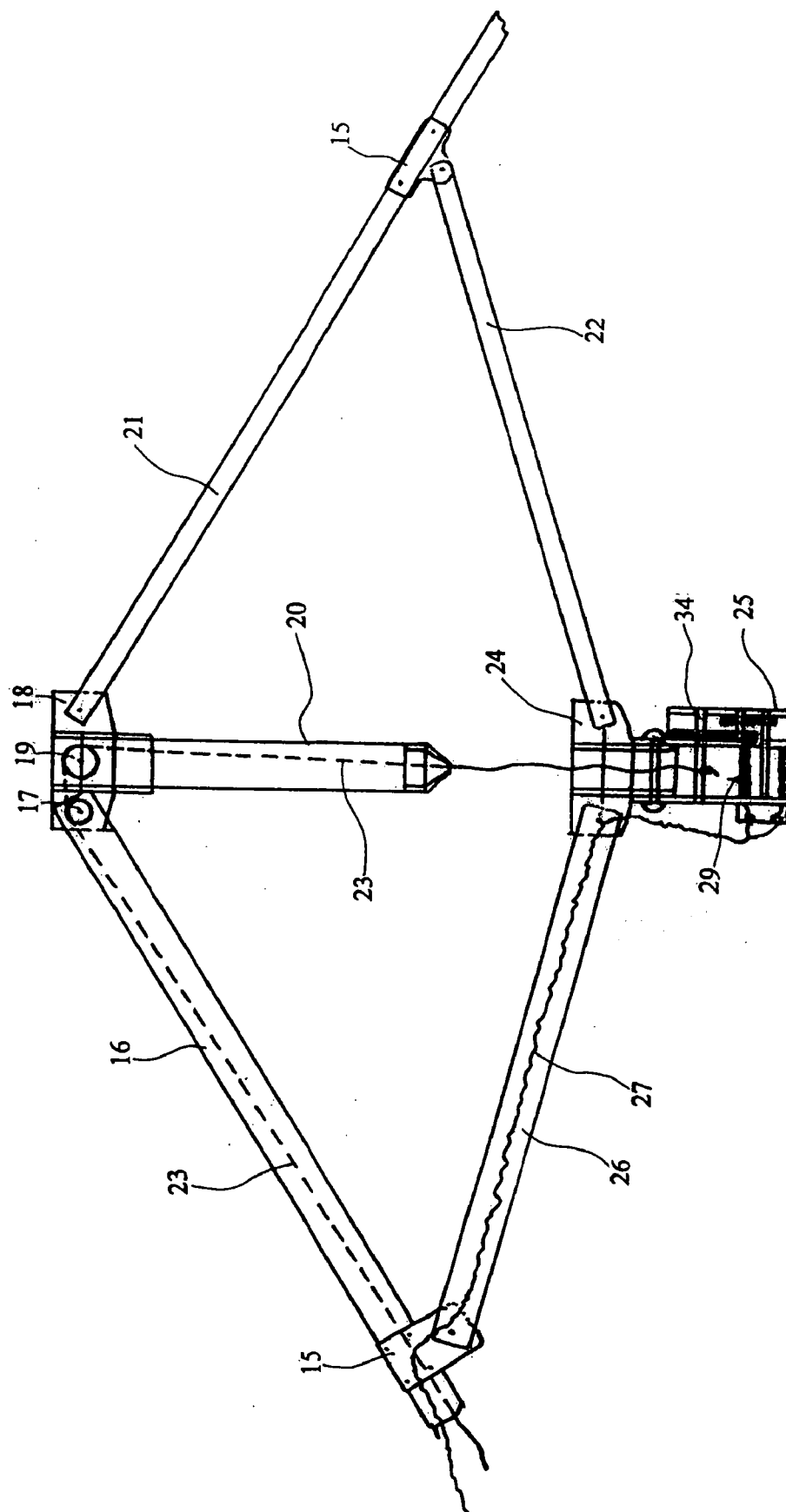


FIG. 5

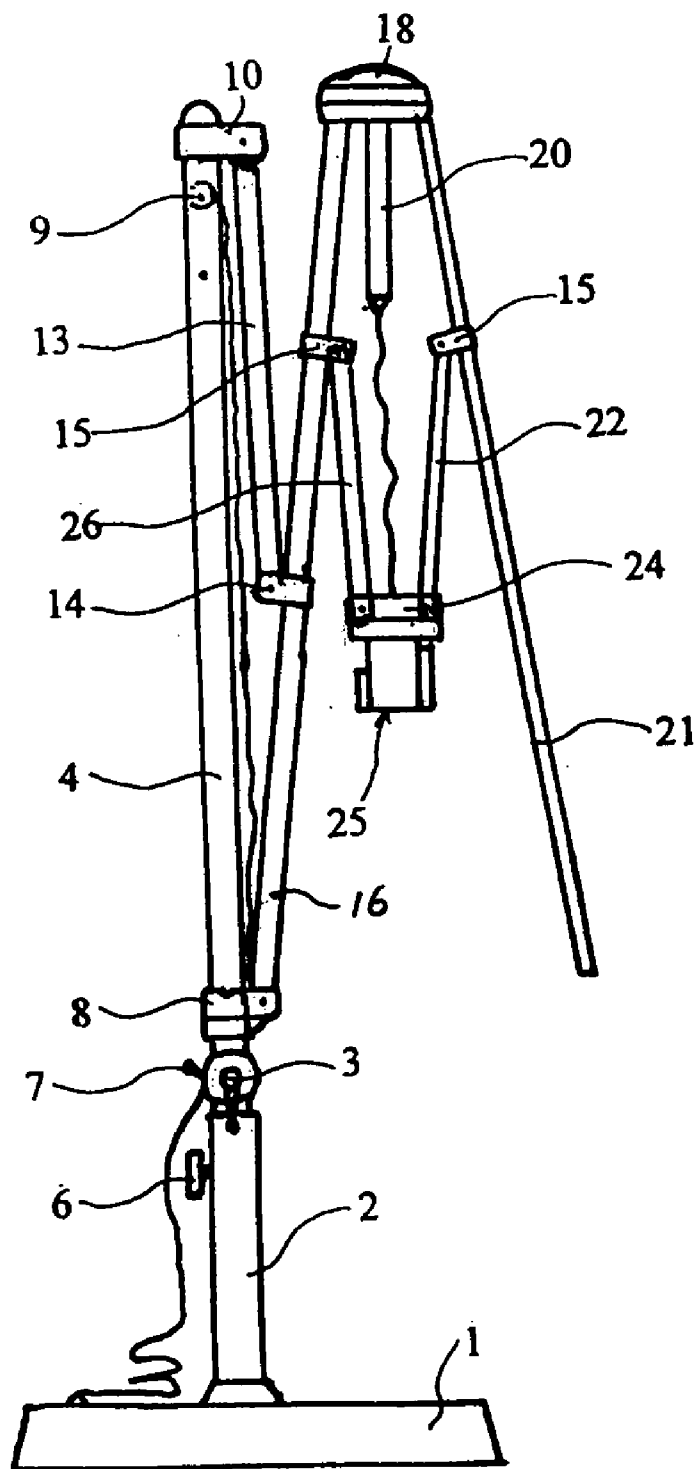


FIG.6

ELECTRIC UMBRELLA STAND

RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119(a) for Chinese Patent Application No. 02222676.1, filed Jul. 23, 2003, titled "An Electrical Stand Umbrella."

FIELD

[0002] The present invention relates to a umbrella stand, and more particularly to an electric umbrella stand.

BACKGROUND

[0003] Leisure sites such as plazas, beaches, or lawns are generally installed with umbrella stands to provide sunshade places. A conventional umbrella stand with a suspending arm is widely used because it has a high umbrella, a large space under the umbrella, and a good sunshade effect. This conventional stand umbrella has a crank mounted on a stand pole. By turning the crank to tighten or loosen a rope, the umbrella can be opened or closed. However, the umbrella is so big that it is very difficult and inconvenient to operate the crank.

[0004] There are two patents, U.S. Pat. No. 5,116,258 and U.S. Pat. No. 5,960,806, that disclose umbrella stands. These patents have no provisions such that an electric motor is placed onto the suspended frame of the umbrella for avoiding the damage by weather.

[0005] However, because the electromotor may be installed on the stand pole outside the umbrella, so it may become damp/wet and damaged on rainy days. Moreover, as an important support element, a strength of the stand pole will be lowered if a hole is defined in the stand pole for installing the electromotor and accordingly the umbrella has a short term of using life. Furthermore, considered according to the mechanical principle, the stand pole is the component that needs a maximum force to draw the rope, so an electromotor has to output a large power. In addition, because the crank is eliminated, a user can not open or close the umbrella in case of a failure of power supply or the electromotor.

[0006] Therefore, an electric umbrella stand that solves the aforementioned problems is needed.

SUMMARY

[0007] The main objective of the present invention is to provide an electric umbrella stand, which is reliably operated, and has a long term of using life and a lower power.

[0008] Another objective of the present invention is to provided an electric umbrella stand which can be manually operated without power supply.

[0009] According to an aspect of the invention, an electric umbrella stand including a stand pole, a pulley within the stand pole, a sliding seat movably mounted over the stand pole, a suspending arm, a pulling arm, a frame and a drive mechanism; said frame having a fixed joint mounted at a top of a central rod, a movable joint mounted at a bottom of said central rod, and multiple upper ribs and lower ribs, said suspending arm having two ends respectively and pivotally connected to said sliding seat and said fixed joint, and a middle portion pivotally mounted on an end of said pulling

end, the other end of said pulling end pivotally mounted on a top of said stand pole; said upper ribs each having an end pivotally mounted on said fixed joint, said lower ribs each having a first end pivotally mounted on said movable joint, and a second end pivotally mounted on the respective upper rib and suspending arm; said drive mechanism having an electromotor, a rope axle linked to said electromotor by a gear assembly, and a rope having a first end fastened on said rope axle; characterized in that said drive mechanism is installed in said movable joint, said rope has a second end extending in turn passing through the tubing body of said frame, said suspending arm, and said pulley and fastened on said stand pole, and said electromotor is electrically connected with a power supply by a wire. The electric wire is in turn passing through and hidden within the pipe of the thick rib, partial sector of suspending arm, pulling arm, via a fixed seat on the top place of said stand pole, finally along said stand pole downwardly running to the electric adapter.

[0010] According to another aspect of the invention, said crank is installed on said stand pole, and the second end of said rope is fastened on said crank.

[0011] According to a further aspect of the invention, an upper crown block and a lower crown block are respectively mounted at the two ends of said suspending arm, a central crown block is mounted at the top of said central rod, and said rope is wound on said crown blocks.

[0012] According to another further aspect of the invention, said power supply is a battery installed in a base under said stand pole.

[0013] According to another further aspect of the invention, said battery is a chargeable battery or a solar battery.

[0014] According to another aspect of the invention, the umbrella further comprising a remote controller and a signal receiver to actuate said electromotor.

[0015] Compared with the prior art, the present invention has the following advantages. Because the drive mechanism is under the umbrella, it will not be dampened, wetted in rainy days and can be reliably operated. Secondly, the pole without cutting has enough strength and has a long term of using life. Furthermore, the movable joint is the position to draw the rope with a minimum force, so the electromotor has a low output power and a high efficient. By using the battery, the umbrella can be used in a situation without power supply. It is advantageous to environment protection by using the solar battery. By using the remote controller, it is very easy and convenient for a user to close/open the umbrella.

BRIEF DESCRIPTION OF DRAWINGS

[0016] FIG. 1 is a schematic view of an electric umbrella stand according to the present invention in an open state;

[0017] FIG. 2 is a partially schematic view of a frame of the umbrella spread with a cloth;

[0018] FIG. 3 is a fragmentary and enlarged sectional view of a drive mechanism of the umbrella according to the present invention;

[0019] FIG. 4 is a schematic view of the electric umbrella stand assembled with a solar battery;

[0020] FIG. 5 is a partially schematic view of the frame in the open state; and

[0021] FIG. 6 is a schematic view of the umbrella in a closed state.

DESCRIPTION

[0022] In this patent, the umbrella stand has a pulley, a stand pole, an inclined pulling rod, a frame, an inclined supporting rod, a sleeve, and a rope. An electromotor is installed on the stand pole. A first gear is mounted on an output axle of the electromotor, and a second gear engaged with the first gear is mounted on a rope axle. The rope has a first end connected to the rope axle, and a second end extending through the pulley, the inclined pulling rod and inclined support rod to connect with the frame.

[0023] When the electromotor is actuated to drive the gears, the rope axle is turned to wind the rope, and the frame is drawn to open/close the umbrella. Thus, the problem of the crank is obviated.

[0024] With reference to FIG. 1, an electric umbrella stand according to the present invention comprises a stand pole (4), a pulley (9), a sliding seat (8), a suspending arm (16), a pulling arm (13), a frame and a drive mechanism.

[0025] The frame has a fixed joint (18) on a top of a central rod (20), a movable joint (24) on a bottom of the central rod (20), a plurality of upper ribs (21) and lower ribs (22).

[0026] The stand pole (4) is a hollow bar, of which a lower end is inserted and fastened in a tube (2) by a screw (6). The tube (2) is installed on a base (1) to prevent the umbrella from upsetting. A fixed seat (10) is mounted on a top of the stand pole (4), and the pulley (9) is provided inside an upper portion of the stand pole (4). The sliding seat (8) is slidably mounted outside a middle portion of the stand pole (4). The suspending arm (16) has a first end pivotally mounted on the slidable seat (8) and a second end pivotally mounted on the fixed joint (18) by pivot pins (not shown). A movable block (14) is provided on a middle portion of the suspending arm (16), and the pulling arm (13) has a first end pivotally mounted on the fixed seat (10) and a second end pivotally mounted on the movable block (14) by pivot pins (not shown).

[0027] Each of upper ribs (21) has a first end pivotally mounted on the fixed joint (18); and each of the lower ribs (22) has a first end pivotally mounted on the movable joint (24). Multiple couplers (15) are respectively provided on the upper ribs (21) and the suspending arm (16) between the movable block (14) and the fixed joint (18). By the couplers (15), the lower ribs (22) has a second end pivotally mounted on the upper ribs (21) and the suspending arm (16). In this embodiment, connected between the movable joint (25) and the suspending arm (16) is a thick rib (26) with an outer diameter larger than an outer diameter of the lower ribs (22) to reinforce the strength of the umbrella.

[0028] With reference to FIG. 2, a cloth (28) is then spread over the frame and the movable block (14) is exposed from the cloth (28). With reference to FIG. 1, the cloth (28) is clipped by a clip (12) on the suspending arm (16), so the umbrella can provided a sunshade effect.

[0029] With reference to FIG. 3, the drive mechanism includes an electromotor (29), and a rope axle (34) con-

nected to the motor (29) by a gear assembly. The gear assembly has a first driving gear (30) mounted on an output axle of the electromotor (29), a first driven gear (31) engaged with the first drive gear (30), a second driving gear (32) coaxial with the first driven gear (31), and second driven gear (33) engaged with the second driving gear (32) and mounted on the rope axle (34). A rope (23) has a first end extending through an aperture of the rope axle (34) and tied a knot for being fixed on the rope axle (34), and a second end in turn extending to/through the central rod (20) via the suspending arm (16), and the pulley (9) and fixed on upper position of the stand pole (4).

[0030] A wire (27) connected to the electromotor (29) in turn extends through the thick rib (26), the suspending arm (16), and the pulling arm (13), and is electrically connected to a first end of control switch (7) with two modes—forward and backward. The control switch (7) has a second end electrically connected with a power supply by an electric adapter (5). The power supply's voltage can be 220V or 110V, or be transformed into 12V, 24V or 36V by the electric adapter (5). Of course, a rechargeable battery or a solar battery can be used as the source of power supply. As shown in FIG. 4, the battery (35) is installed in the base (1). When the battery (35) is the solar battery, a photoelectric plate (36) is laterally installed at the top of the stand pole (4) for receiving solar energy. At the same time, the control switch (7) can be replaced with a remote controller and a signal receiver to facilitate operating the umbrella.

[0031] For preventing the rope (23) from wearing, a stationary pulley (17) and stationary pulley (11) are respectively mounted at two ends of the suspending arm (16), and a stationary pulley (19) is mounted on the top of the central rod (20). The rope (23) is wound on the stationary pulley (19, 17, 11). A crank (3) is mounted on the stand pole (4) and the second end of the rope (23) is connected to the crank (3) for manually operating the umbrella in case the electric operation is not allowed.

[0032] In use, the control switch (7) is powered on to actuate the electromotor (29), the first drive gear (30) drive the first driven gear (31), the second drive gear (32) and the second driven gear (33) to rotate. Thus, the rope axle (34) is turned to reel in the rope (23) thereon. The movable joint (24) is pulled upwards by the rope (23), and the lower ribs (22) and the thick rib (26) are expanded to unfold the suspending arm (16) and upper ribs (21), as illustrated in FIG. 5. Because the rope (23) is shortened, the sliding seat (8) is raised to the peak position to completely unfold the frame of the umbrella as well as the cloth (28).

[0033] When the control switch (7) is operated in a backward mode, the electromotor (29) is actuated inversely, so the rope (23) is loosened and the frame will be automatically folded under the gravity of weight as shown in FIG. 6.

[0034] The electric wire (27) is passing through in turn and hidden within the pipe of the thick rib (26), partial sector of suspending arm (16), pulling arm (13), then via a fixed seat (10) on the top place of said stand pole (4), finally along said stand pole (4) downwardly running to the electric adapter (5).

What is claimed is:

1. An electric umbrella stand comprising:

a stand pole;

a pulley in the stand pole;

a sliding seat movably mounted outside the stand pole;

a suspending arm;

a pulling arm;

a frame with a drive mechanism, the frame having a fixed joint mounted at a top of a central rod;

a movable joint mounted at a bottom of the central rod;

at least one upper rib; and

at least one lower rib;

where the suspending arm has two ends, the ends respectively and pivotally connected to the sliding seat and the fixed joint,

where the suspending arm has a middle portion that is pivotally mounted on a first end of the pulling arm,

where a second end of the pulling arm is pivotally mounted on a top of the stand pole,

where the at least one upper rib has a first upper rib end pivotally mounted on the fixed joint,

where the at least one lower rib has a first lower rib end pivotally mounted on the movable joint,

where the at least one lower rib has a second lower rib end pivotally mounted on the coupler of the at least one upper rib and suspending arm,

where the drive mechanism has an electromotor,

where a rope axle is coupled to the electromotor by a gear assembly,

where a first end of a rope is fastened on the rope axle,

where the drive mechanism is installed onto the movable joint,

where a second end of the rope passes through:

the frame, the suspending arm, and the pulley,

where the second end of the rope is fastened to the stand pole, and

where the electromotor is electrically connected to a power supply via a wire.

2. The umbrella stand of claim 1, further comprising a crank, the crank being installed on the stand pole, where the second end of the rope is fastened on the crank.

3. The umbrella stand of claim 1, further comprising:

an upper stationary pulley;

a lower stationary pulley; and

a central stationary pulley;

where the upper and lower pulleys are mounted at upper and lower ends of the suspending arm respectively,

where the central pulley is mounted at the top of the central rod, and

where the rope is wound on the upper, lower, and central pulleys.

4. The umbrella stand of claims 1, 2, or 3, wherein the power supply is a battery installed in a base under the stand pole.

5. The umbrella stand of claim 4, wherein the battery is a rechargeable battery.

6. The umbrella stand of claim 4, wherein the battery is a solar battery.

7. The umbrella stand of claim 1, 2 or 3, further comprising a remote controller and a signal receiver to actuate the electromotor.

8. The umbrella stand of claim 1, 2 or 3, wherein the electric wire passes through in turn and hidden within the pipe of the thick rib, partial sector of suspending arm, pulling arm via a fixed seat on the top place of the stand pole, finally along the stand pole downwardly running to and connected with the electric adapter.

9. The umbrella stand of claim 1, 2 or 3, characterized in that the electric motor is dual-direction rotatable motor.

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