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(54) HAND-HELD CLOTHES AIRING DEVICE

(57) A hand-held clothes airing device is disclosed, including a handle assembly (1), an airing device (2), a supporting device (3), a first hinged piece (21), a second hinged piece (34), an upper connection body (11), a lower connection body (6), an inner pipe (4) and an outer pipe (5); the handle assembly is fixedly connected to an upper end of the inner pipe; a lower end of the inner pipe is sleeved to an interior of the outer pipe and can be slid up and down in the outer pipe; the airing device is hinged to the upper connection body; the upper connection body is fixed on an upper end of the outer pipe; two ends of the first hinged piece are respectively hinged to the airing device and the handle assembly; the supporting device is hinged to the lower connection body; two ends of the second hinged piece are respectively hinged to the supporting device and the outer pipe; the lower connection body is slidably connected to the outer pipe; a sliding groove (24) is formed on a sidewall of the outer pipe; the lower connection body is fixedly connected to the lower end of the inner pipe; the airing device and the supporting device can be unfolded or folded; when the airing device is completely unfolded, the handle assembly is clamped with the upper connection body; and when the airing device is folded, the handle assembly is separated from the upper connection body. The present invention is convenient to operate, small in floor area and convenient to carry.

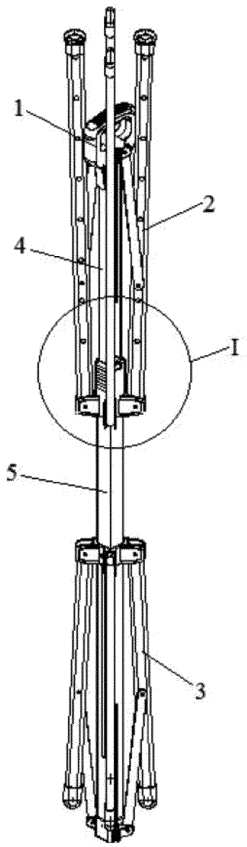

Figure 1

EP 3 767 025 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of living supplies, and in particular to a hand-held clothes airing device.

BACKGROUND

[0002] The clothes needs to be aired frequently in life. It is general for an ordinary family to provide a clothes airing rod or a clothes airing rack in a house, and a user may use the clothes airing rod or the clothes airing rack to air the clothes.

[0003] When people drives a car or a touring car to go for a trip or a camp, and when the clothes need to be washed, there is no clothes airing rod or clothes airing rack for the people to air the washed clothes. A common clothes airing device is very heavy and only can air the clothes at a fixed position; and moreover, the common clothes airing device is folded complexly and not carried conveniently, thus bringing a great inconvenience to the travel life of the people.

SUMMARY

[0004] An objective of the present invention is to provide a hand-held clothes airing device to solve the above problem in the prior art. The hand-held clothes airing device is convenient to operate, small in floor area and convenient to carry.

[0005] To achieve the above purpose, the present invention provides the following technical solution.

[0006] A hand-held clothes airing device includes a handle assembly, an airing device, a supporting device, a first hinged piece, a second hinged piece, an upper connection body, a lower connection body, an inner pipe and an outer pipe, where the handle assembly is fixedly connected to an upper end of the inner pipe; a lower end of the inner pipe is sleeved to an interior of the outer pipe and can be slid up and down in the outer pipe; the airing device is hinged to the upper connection body; the upper connection body is fixed on an upper end of the outer pipe; one end of the first hinged piece is hinged to the airing device, and the other end of the first hinged piece is hinged to the handle assembly; the supporting device is located below the airing device; the supporting device is hinged to the lower connection body; one end of the second hinged piece is hinged to the supporting device, and the other end of the second hinged piece is hinged to the outer pipe; the lower connection body is slidably connected to the outer pipe; a sliding groove is formed on a sidewall of the outer pipe; the lower connection body is fixedly connected to the lower end of the inner pipe via a slider; the slider passes through the sliding groove and can be slid up and down in the sliding groove; the airing device and the supporting device can be unfolded or folded; when the airing device is completely unfolded, the handle assembly is clamped with the upper connection body; and when the airing device is folded, the handle assembly is separated from the upper connection body.

[0007] Preferably, the handle assembly includes a handle cover, a lifting yoke, a handle and a hook; the handle cover is connected to the lifting yoke via a first spring; two ends of the handle cover are in interference fit with the handle via a connection post; the lifting yoke is disposed in the handle and can be moved up and down in the handle; the handle is fixedly connected to the upper end of the inner pipe; two hooks are provided; the hook is rotatably connected to the handle via an antiskid pin; a second spring is disposed on an inner upper portion of the hook; two fixed plates are disposed on a lower side of the lifting yoke; the second spring is fixedly connected to the fixed plates; a clamping portion is disposed on a lower inner side of the lifting yoke; a clamping head is disposed on an upper outer side of the hook; a latch is disposed on a lower inner side of the hook; the clamping portion can be clamped with the clamping head; and the latch can be clamped with a tooth disposed on an outer side of the upper connection body.

[0008] Preferably, an elastic strip is disposed on an upper side of the upper connection body; when the airing device is folded, the elastic strip can block a lock catch, disposed on a lower side of the inner pipe, to limit a relative movement between the inner pipe and the outer pipe when the hand-held clothes airing device is in a completely folded state.

[0009] Preferably, the airing device includes an arm pipe; a first hinged portion is disposed on a lower side of the upper connection body; one end of the arm pipe is hinged to the first hinged portion, and the other end of the arm pipe is spliced with an end cap; a middle portion of the arm pipe is hinged to one end of the first hinged piece; and the other end of the first hinged piece is hinged to a lower portion of the handle assembly.

[0010] Preferably, a plurality of the arm pipes, a plurality of the first hinged pieces and a plurality of the first hinged portions are provided and are uniformly distributed; and the arm pipe, the first hinged piece and the first hinged portion are matched in number.

[0011] Preferably, the airing device further includes a plurality of parallel clothes airing ropes; a plurality of rope fasteners are uniformly distributed on the arm pipe; and each clothes airing rope sequentially passes through the rope fasteners on same positions of the plurality of the arm pipes and is connected end to end.

[0012] Preferably, the supporting device includes a foot pipe; a second hinged portion is disposed on the lower connection body; one end of the foot pipe is hinged to the second hinged portion; a foot sleeve is spliced to the other end of the foot pipe; a middle portion of the foot pipe is hinged to one end of the second hinged piece; and the other end of the second hinged piece is hinged to a lower portion of the outer pipe.

[0013] Preferably, a plurality of the foot pipes, a plural-

ity of the second hinged pieces and a plurality of the second hinged portions are provided and are uniformly distributed; and the foot pipe, the second hinged piece and the second hinged portion are matched in number.

[0014] Preferably, a lining sleeve is disposed on a lower end of the inner pipe; the inner pipe is sleeved to the interior of the outer pipe via the lining sleeve; and an antiskid mat is disposed on a lower end of the outer pipe.

[0015] Preferably, a length of the sliding groove is smaller than a length of the inner pipe.

[0016] Compared with the prior art, the present invention achieves the following technical effects:

1. The hand-held clothes airing device is original in style, can implement a synchronous action between an airing device and a supporting device, implements quick unfolding and folding of the clothes airing device and explains brand-new unfolding and folding modes of the clothes airing device.
2. The hand-held clothes airing device is provided with the supporting device, and can be placed at any expected position, so the movement is convenient and quick, and the application is wide.
3. An inner pipe has a lock catch, so that an arm pipe of the hand-held clothes airing device can be prevented from opening automatically in a folded state, and thus the hand-held clothes airing device is carried conveniently and stored conveniently.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] To describe the technical solutions in the embodiments of the present invention or in the prior art more clearly, the following briefly introduces the accompanying drawings required for describing the embodiments. Apparently, the accompanying drawings in the following description show merely some embodiments of the present invention, and a person of ordinary skill in the art may still derive other drawings from these accompanying drawings without creative efforts.

FIG. 1 is a structural schematic diagram of a hand-held clothes airing device in a folded state according to an embodiment of the present invention.

FIG. 2 is a structural schematic diagram of a hand-held clothes airing device in an unfolded state according to an embodiment of the present invention.

FIG. 3 is an exploded diagram of a hand-held clothes airing device according to an embodiment of the present invention.

FIG. 4 is a partial enlarged diagram of an I place in FIG. 1.

FIG. 5 is an exploded diagram of a handle assembly according to an embodiment of the present invention.

FIG. 6 is an external structural schematic diagram of a handle assembly when a hand-held clothes airing device is in an unfolded state according to an embodiment of the present invention.

FIG. 7 is an internal structural schematic diagram of a handle assembly when a hand-held clothes airing device is in an unfolded state according to an embodiment of the present invention.

[0018] In the figure: 1-handle assembly, 2-airing device, 3-supporting device, 4-inner pipe, 5-outer pipe, 6-lower connection body, 7-connection piece, 8-antiskid mat, 9-foot sleeve, 10-end cap, 11-upper connection body, 12-lock catch, 13-gasket, 14-rope fastener, 15-clothes airing rope, 16-antiskid pin, 17-connection post, 18-fixed plate, 19-arm pipe, 20-foot pipe, 21-first hinged piece, 22-first spring, 23-second spring, 24-sliding groove, 25-handle, 26-handle cover, 27-lifting yoke, 28-hook, 29-lining sleeve, 30-tooth, 31-elastic strip, 32-slider, 33-first hinged portion, 34-second hinged piece, 35-clamping portion, 36-clamping head, 37-latch, and 38-second hinged portion.

DETAILED DESCRIPTION

[0019] A clear and complete description of the technical solutions in the embodiments of the present invention will be given below, in combination with the accompanying drawings. The embodiments described below are exemplary embodiments of the present invention.

[0020] In the description of the various embodiments, it is to be understood that, orientation or position relationships indicated by the terms "upper", "lower", "left" and "right" are based on the orientation or position relationships as shown in the drawings, for ease of the description of a structure and an operation manner only, rather than indicating or implying that the indicated part must have a particular orientation or be operated in a particular orientation. Therefore, these terms should not be understood as a limitation to the present invention.

[0021] An objective of the present invention is to provide a hand-held clothes airing device to solve the problem in the prior art. The hand-held clothes airing device is convenient to operate, small in floor area and convenient to carry.

[0022] To make the above objective, characteristics and advantages of the present invention more understandable, embodiments of the present invention will be further described below in detail in combination with the accompanying drawings.

[0023] As shown in FIG. 1 to FIG. 7, this embodiment provides a hand-held clothes airing device, which includes a handle assembly 1, an airing device 2, a supporting device 3, a first hinged piece 21, a second hinged piece 34, an upper connection body 11, a lower connection body 6, an inner pipe 4 and an outer pipe 5. The handle assembly 1 is fixedly connected to an upper end of the inner pipe 4; a lower end of the inner pipe 4 is sleeved to an interior of the outer pipe 5 and can be slid up and down in the outer pipe 5; the airing device 2 is hinged to the upper connection body 11; the upper con-

nection body 11 is fixed on an upper end of the outer pipe 5; one end of the first hinged piece 21 is hinged to the airing device 2, and the other end of the first hinged piece 21 is hinged to the handle assembly 1; the supporting device 3 is located below the airing device 2; the supporting device 3 is hinged to the lower connection body 6; and one end of the second hinged piece 34 is hinged to the supporting device 3, and the other end of the second hinged piece 34 is hinged to the outer pipe 5. The first hinged piece 21 and the second hinged piece 34 both are preferably a band iron. The lower connection body 6 is slidably connected to the outer pipe 5; a sliding groove 24 is formed on a sidewall of the outer pipe 5; the lower connection body 6 is fixedly connected to the lower end of the inner pipe via a slider 32; and the slider 32 passes through the sliding groove and can be slid up and down in the sliding groove to implement a synchronous action between the airing device 2 and the supporting device 3. Specifically, the slider is preferably a pin roll. The airing device 2 and the supporting device 3 can be unfolded or folded. When the airing device 2 is completely unfolded, the handle assembly 1 is clamped with the upper connection body 11. When the airing device 2 is folded, the handle assembly 1 is separated from the upper connection body 11. An elastic strip 31 is disposed on an upper side of the upper connection body 11. When the airing device 2 is completely folded, the elastic strip 31 can block a lock catch 12, disposed on a lower side of the inner pipe 5, to limit a relative movement between the inner pipe 4 and the outer pipe 5 when the hand-held clothes airing device is in a folded state.

[0024] Specifically, a lining sleeve 29 is fixed by a long rivet on a lower end of the inner pipe 4, and the inner pipe 4 is sleeved to the interior of the outer pipe 5 via the lining sleeve 29. With the lining sleeve 29, the stability when the inner pipe 4 is slid up and down in the outer pipe 5 is guaranteed, and the inner pipe 4 is prevented from shaking in a sliding process. A length of the sliding groove 24 is smaller than a length of the inner pipe 4. The length of the sliding groove 24 is equivalent to a sliding stroke of the inner pipe 4, so it is assured that the inner pipe 4 is not slid out of an upper end of the outer pipe 5, the condition that the inner pipe 4 is separated from the outer pipe 5 in the sliding process is prevented, and a certain limiting effect is taken for the slide of the inner pipe 4. An antiskid mat 8 is fixed on a lower end of the outer pipe 5 via a rivet. The antiskid mat 8 is preferably a foam board, and more preferably a backing chloroprene rubber adhesive foam board.

[0025] The handle assembly 1 includes a handle cover 26, a lifting yoke 27, a handle 25 and a hook 28. The handle cover 26 is connected to the lifting yoke 27 via a first spring 22. Specifically, the handle cover 26 is fixed with the first spring 22 via a screw. Two ends of the handle cover 26 are in interference fit with the handle 25 via a connection post 17; the lifting yoke 27 is disposed in the handle 25 and can be moved up and down in the handle 25; the handle 25 is fixedly connected to the upper end of the inner pipe 4; two hooks 28 are provided; the hook 28 is rotatably connected to the handle 25 via an antiskid pin 16; a second spring 23 is fixed on an inner upper portion of the hook 28 via the screw; two fixed plates 18 are disposed on a lower side of the lifting yoke 27; the second spring 23 is fixedly connected to the fixed plates 18 via the screw; a clamping portion 35 is disposed on a lower inner side of the lifting yoke 27; a clamping head 36 is disposed on an upper outer side of the hook 28; a latch 37 is disposed on a lower inner side of the hook 28; the clamping portion 35 can be clamped with the clamping head 36 via a bottom of the handle 25; and the latch 37 can be clamped with a tooth 30 disposed on an outer side of the upper connection body 11.

[0026] The airing device 1 includes an arm pipe 19; a first hinged portion 33 is disposed on a lower side of the upper connection body 11; one end of the arm pipe 19 is hinged to the first hinged portion 33, and the other end of the arm pipe 19 is spliced with an end cap 10; a middle portion of the arm pipe 19 is hinged to one end of the first hinged piece 21; and the other end of the first hinged piece 21 is hinged to a lower portion of the handle assembly 1 via a connection piece 7. As a result, the arm pipe 19 is folded and unfolded conveniently. Specifically, the connection piece 7 is fixedly connected to a lower end of the handle 25 via a self-tapping screw; and a gasket 13 is disposed at a hinged place between the first hinged piece 21 and the arm pipe 19 to reduce the friction between the first hinged piece 21 and the arm pipe 19. A hole capable of hanging a clothes rack is formed on the end cap 10. Furthermore, with the end cap 10, it is also assured that an operator is not scratched in use and a certain protection effect is taken for an end portion of the arm pipe 19. The arm pipe 19, the first hinged piece 21 and the first hinged portion 33 are matched in number. Specifically, four arm pipes 19, four first hinged pieces 21 and four first hinged portions 33 are preferably provided and are uniformly distributed.

[0027] The airing device 2 further includes a plurality of parallel clothes airing ropes 15. Eight rope fasteners 14 are preferably and uniformly distributed on the arm pipe 19. Each clothes airing rope 15 sequentially passes through the rope fasteners 14 on same positions of a plurality of arm pipes 19 and is connected end to end. The clothes airing ropes 15 are preferably nylon ropes.

[0028] The supporting device 3 includes a foot pipe 20; a second hinged portion 38 is disposed on the lower connection body 6; one end of the foot pipe 20 is hinged to the second hinged portion 33; a middle portion of the foot pipe 20 is hinged to one end of the second hinged piece 34; and the other end of the second hinged piece 34 is hinged to a lower portion of the outer pipe 5 via the connection piece 7. Specifically, the gasket 13 is disposed at a hinged place between the second hinged piece 34 and the foot pipe 20 to reduce the friction between the second hinged piece 34 and the foot pipe 20; and the connection piece 7 is fixedly connected to the outer pipe 5 via the self-tapping screw, so that the foot pipe 20 is

folded and unfolded conveniently. A foot sleeve 9 is spliced to the other end of the foot pipe 20, so that the outer pipe 5 and the foot pipe 20 are not abraded when lower ends of the outer pipe 5 and the foot pipe 20 contact with the ground or other support surfaces. The foot sleeve 9 takes the effect of protecting the outer pipe 5 and the foot pipe 20 and simultaneously does not scratch the ground or the other support surfaces. The foot pipe 20, the second hinged piece 34 and the second hinged portion 33 are matched in number. Specifically, four foot pipes 20, four second hinged pieces 34 and four second hinged portions 33 are preferably provided and are uniformly distributed.

[0029] A working principle of the hand-held clothes airing device in this embodiment is as follows:

In an initial state, the hand-held clothes airing device is in a folded state. At this time, a lock catch 12 disposed on a lower portion of an inner pipe 4 is located on an upper side of an elastic strip 31 disposed on an upper side of an upper connection body 11, and can block the elastic strip 31, thus limiting the inner pipe 4 to slide downward and guaranteeing that an airing device 2 is not unfolded automatically.

[0030] When the hand-held clothes airing device needs to be unfolded to air clothes, an operator holds a lifting yoke 27 by a hand and exerts a certain upward pressure to the lifting yoke 27. As the lifting yoke 27 is connected to a handle cover 26 via a first spring 22, the lifting yoke 27 can be moved upward. In a process when the lifting yoke 27 is moved upward, a clamping portion 35 disposed on a lower inner side of the lifting yoke 27 is slid relative to a clamping head 36 disposed on an upper outer side of a hook 28, and extrudes an upper portion of the hook 28 to rotate inward. Under the action of an antiskid pin 16, a lower portion of the hook 28 rotates outward, so that a latch 37 disposed on a lower inner side of the hook 28 is separated from a tooth 30 disposed on an outer side of the upper connection body 11. By propping a lower end of an outer pipe 5 against the ground or other support surfaces and applying a downward pressure to the handle cover 26, the lock catch 12 disposed on the lower portion of the inner pipe 4 forces the elastic strip 31 disposed on the upper side of the upper connection body 11 to expand outward and pushes the elastic strip 31 to open, and thus the inner pipe 4 can be slid downward in the outer pipe 5. Under the action of a first hinged piece 21, an arm pipe 19 is unfolded outward, and simultaneously a lower connection body 6 is slid downward in a sliding groove 24 formed on a sidewall of the outer pipe 5. Under the action of a second hinged piece 34, a foot pipe 20 is unfolded synchronously. By loosening the lifting yoke 27 and applying a certain pressure to the handle cover 26, the clamping portion 35 of the lifting yoke 27 clamps the clamping head 36 of the hook 28, and the latch 37 of the hook 28 is clamped with the tooth 30 of the upper connection body 11 to implement relative fixation between the inner pipe 4 and the outer pipe 5. At this time, when the lower connection body 6 is moved to a lowest end of the sliding groove 24 formed on the sidewall of the outer pipe 5, the arm pipe 19 and the foot pipe 20 are unfolded completely, and thus the hand-held clothes airing device is placed on the ground or any other support surface to air the clothes.

[0031] After the clothes are aired completely, the outer pipe 5 is fixed; the inner pipe 4 is lifted upward by a handle assembly 1, and the lock catch 12 disposed on the lower side of the inner pipe 4 passes through the elastic strip 31 disposed on the upper side of the upper connection body 11 and blocks the elastic strip 31; and at this time, the lower connection body 6 is moved to an uppermost end of the sliding groove 24 to complete a folding action of the hand-held clothes airing device.

[0032] The hand-held clothes airing device in this embodiment is original in style, can implement a synchronous action between an airing device 2 and a supporting device 3, implements quick unfolding and folding of the clothes airing device and explains brand-new unfolding and folding modes of the clothes airing device. The hand-held clothes airing device is provided with the supporting device 3, and can be placed at any expected position, so the movement is convenient and quick, and the application is wide. An inner pipe 4 has a lock catch 12, so that an arm pipe 19 of the hand-held clothes airing device can be prevented from opening automatically in a folded state, and thus the hand-held clothes airing device is carried conveniently and stored conveniently.

[0033] In the specification, specific examples are used for illustration of the principles and implementation methods of the present invention. The description of the embodiments is only used to help illustrate the method and the principles of the present invention. In addition, those skilled in the art can make various modifications in terms of specific embodiments and scope of application in accordance with the concept of the present invention. In conclusion, the content of this specification shall not be construed as a limitation to the present invention.

Claims

1. A hand-held clothes airing device, comprising a handle assembly, an airing device, a supporting device, a first hinged piece, a second hinged piece, an upper connection body, a lower connection body, an inner pipe and an outer pipe, wherein the handle assembly is fixedly connected to an upper end of the inner pipe; a lower end of the inner pipe is sleeved to an interior of the outer pipe and can be slid up and down in the outer pipe; the airing device is hinged to the upper connection body; the upper connection body is fixed on an upper end of the outer pipe; one end of the first hinged piece is hinged to the airing device, and the other end of the first hinged piece is hinged to the handle assembly; the supporting device is located below the airing device; the supporting device is hinged to the lower connection body; one end of the

second hinged piece is hinged to the supporting device, and the other end of the second hinged piece is hinged to the outer pipe; the lower connection body is slidably connected to the outer pipe; a sliding groove is formed on a sidewall of the outer pipe; the lower connection body is fixedly connected to the lower end of the inner pipe via a slider; the slider passes through the sliding groove and can be slid up and down in the sliding groove; the airing device and the supporting device can be unfolded or folded; when the airing device is completely unfolded, the handle assembly is clamped with the upper connection body; and when the airing device is folded, the handle assembly is separated from the upper connection body.

2. The hand-held clothes airing device according to claim 1, wherein the handle assembly comprises a handle cover, a lifting yoke, a handle and a hook; the handle cover is connected to the lifting yoke via a first spring; two ends of the handle cover are in interference fit with the handle via a connection post; the lifting yoke is disposed in the handle and can be moved up and down in the handle; the handle is fixedly connected to the upper end of the inner pipe; two hooks are provided; the hook is rotatably connected to the handle via an antiskid pin; a second spring is disposed on an inner upper portion of the hook; two fixed plates are disposed on a lower side of the lifting yoke; the second spring is fixedly connected to the fixed plates; a clamping portion is disposed on a lower inner side of the lifting yoke; a clamping head is disposed on an upper outer side of the hook; a latch is disposed on a lower inner side of the hook; the clamping portion can be clamped with the clamping head; and the latch can be clamped with a tooth disposed on an outer side of the upper connection body.

3. The hand-held clothes airing device according to claim 1, wherein an elastic strip is disposed on an upper side of the upper connection body; when the airing device is folded, the elastic strip can block a lock catch, disposed on a lower side of the inner pipe, to limit a relative movement between the inner pipe and the outer pipe when the hand-held clothes airing device is in a completely folded state.

4. The hand-held clothes airing device according to claim 1, wherein the airing device comprises an arm pipe; a first hinged portion is disposed on a lower side of the upper connection body; one end of the arm pipe is hinged to the first hinged portion, and the other end of the arm pipe is spliced with an end cap; a middle portion of the arm pipe is hinged to one end of the first hinged piece; and the other end of the first hinged piece is hinged to a lower portion of the handle assembly

5. The hand-held clothes airing device according to claim 4, wherein a plurality of the arm pipes, a plurality of the first hinged pieces and a plurality of the first hinged portions are provided and are uniformly distributed; and the arm pipe, the first hinged piece and the first hinged portion are matched in number.

6. The hand-held clothes airing device according to claim 4, wherein the airing device further comprises a plurality of parallel clothes airing ropes; a plurality of rope fasteners are uniformly distributed on the arm pipe; and each clothes airing rope sequentially passes through the rope fasteners on same positions of the plurality of the arm pipes and is connected end to end.

7. The hand-held clothes airing device according to claim 1, wherein the supporting device comprises a foot pipe; a second hinged portion is disposed on the lower connection body; one end of the foot pipe is hinged to the second hinged portion; a foot sleeve is spliced to the other end of the foot pipe; a middle portion of the foot pipe is hinged to one end of the second hinged piece; and the other end of the second hinged piece is hinged to a lower portion of the outer pipe.

8. The hand-held clothes airing device according to claim 7, wherein a plurality of the foot pipes, a plurality of the second hinged pieces and a plurality of the second hinged portions are provided and are uniformly distributed; and the foot pipe, the second hinged piece and the second hinged portion are matched in number.

9. The hand-held clothes airing device according to claim 1, wherein a lining sleeve is disposed on a lower end of the inner pipe; the inner pipe is sleeved to the interior of the outer pipe via the lining sleeve; and an antiskid mat is disposed on a lower end of the outer pipe.

10. The hand-held clothes airing device according to claim 1, wherein a length of the sliding groove is smaller than a length of the inner pipe.

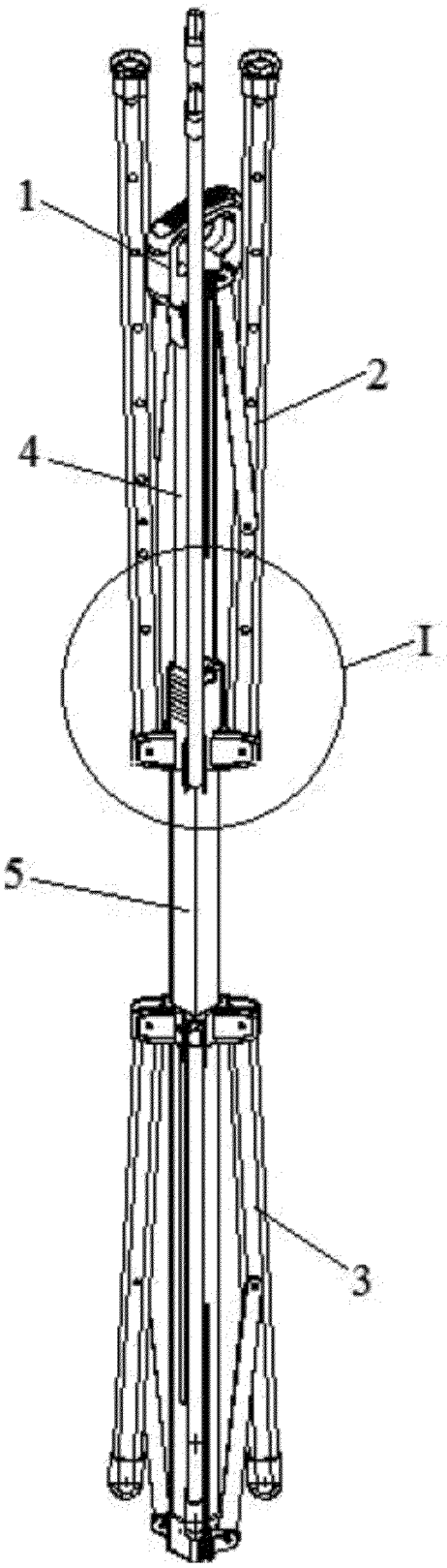

Figure 1

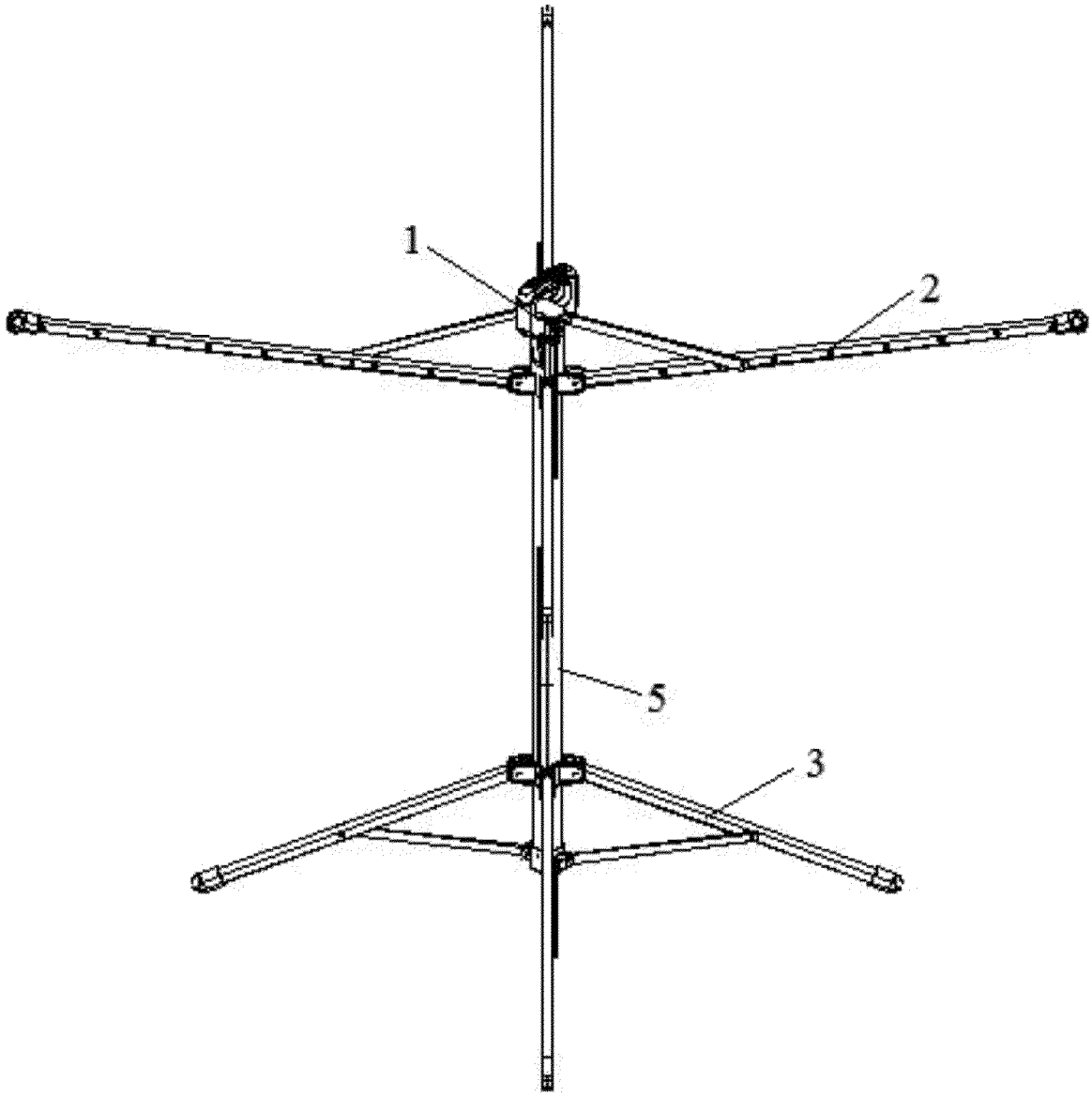

Figure 2

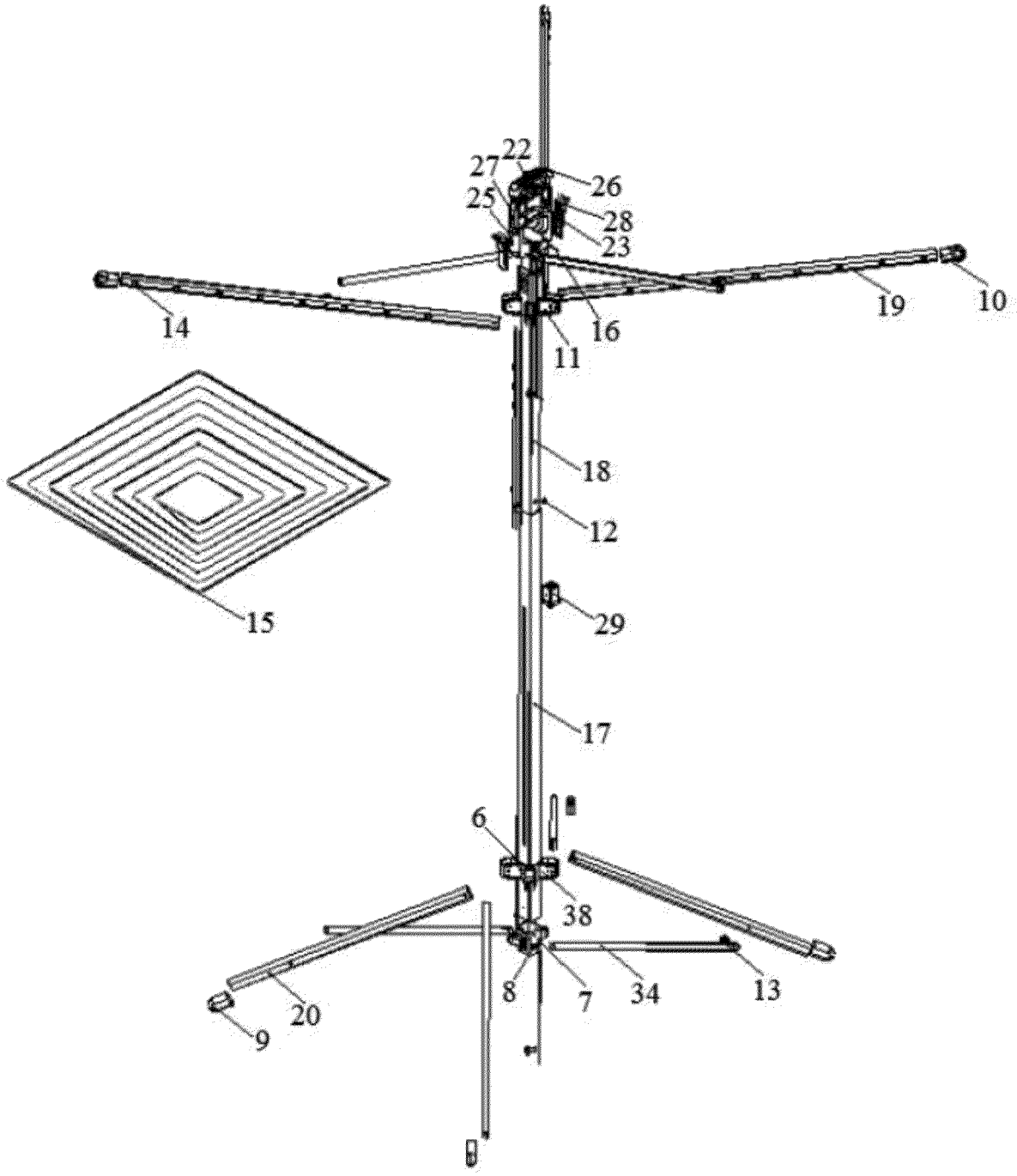

Figure 3

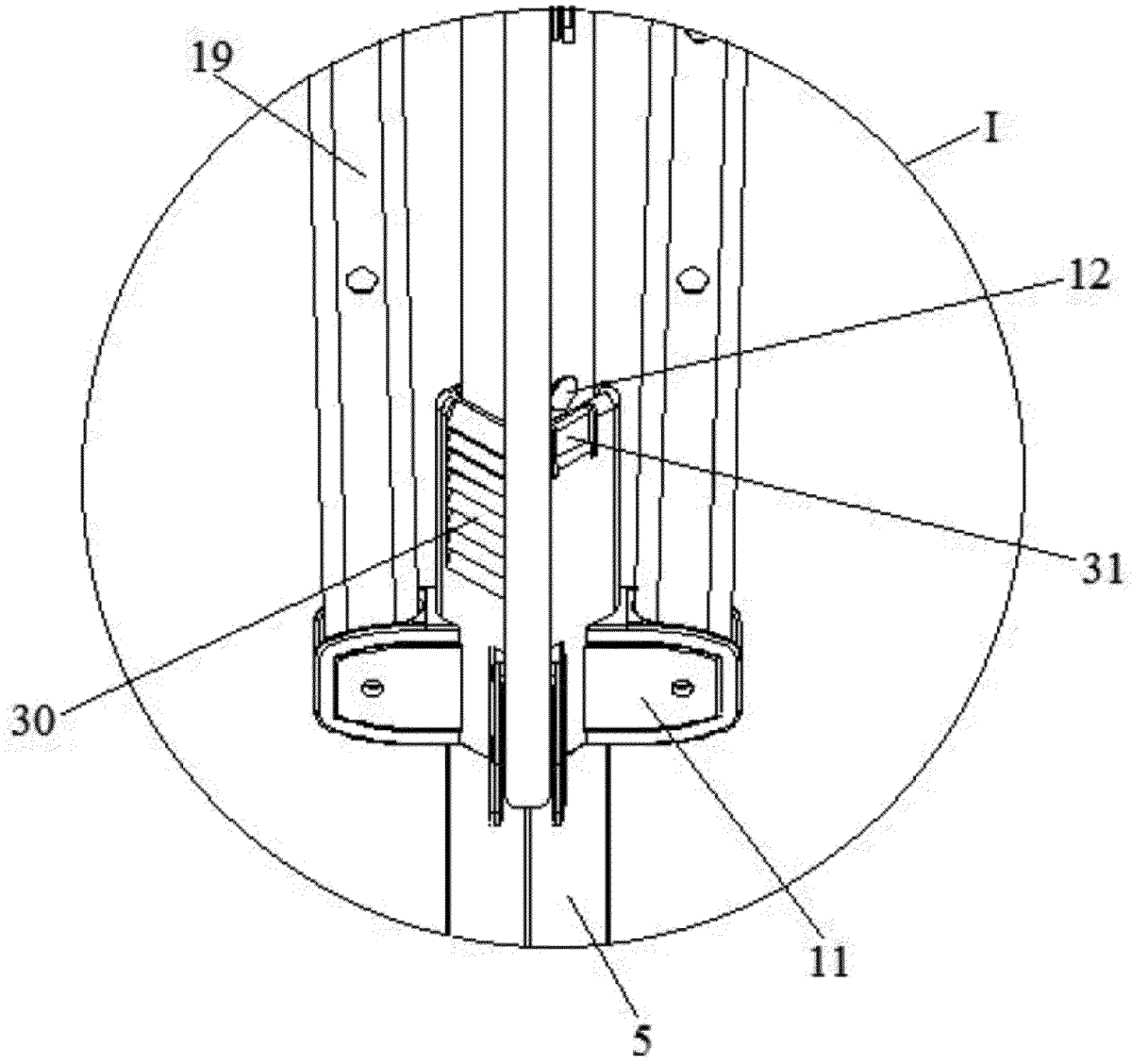

Figure 4

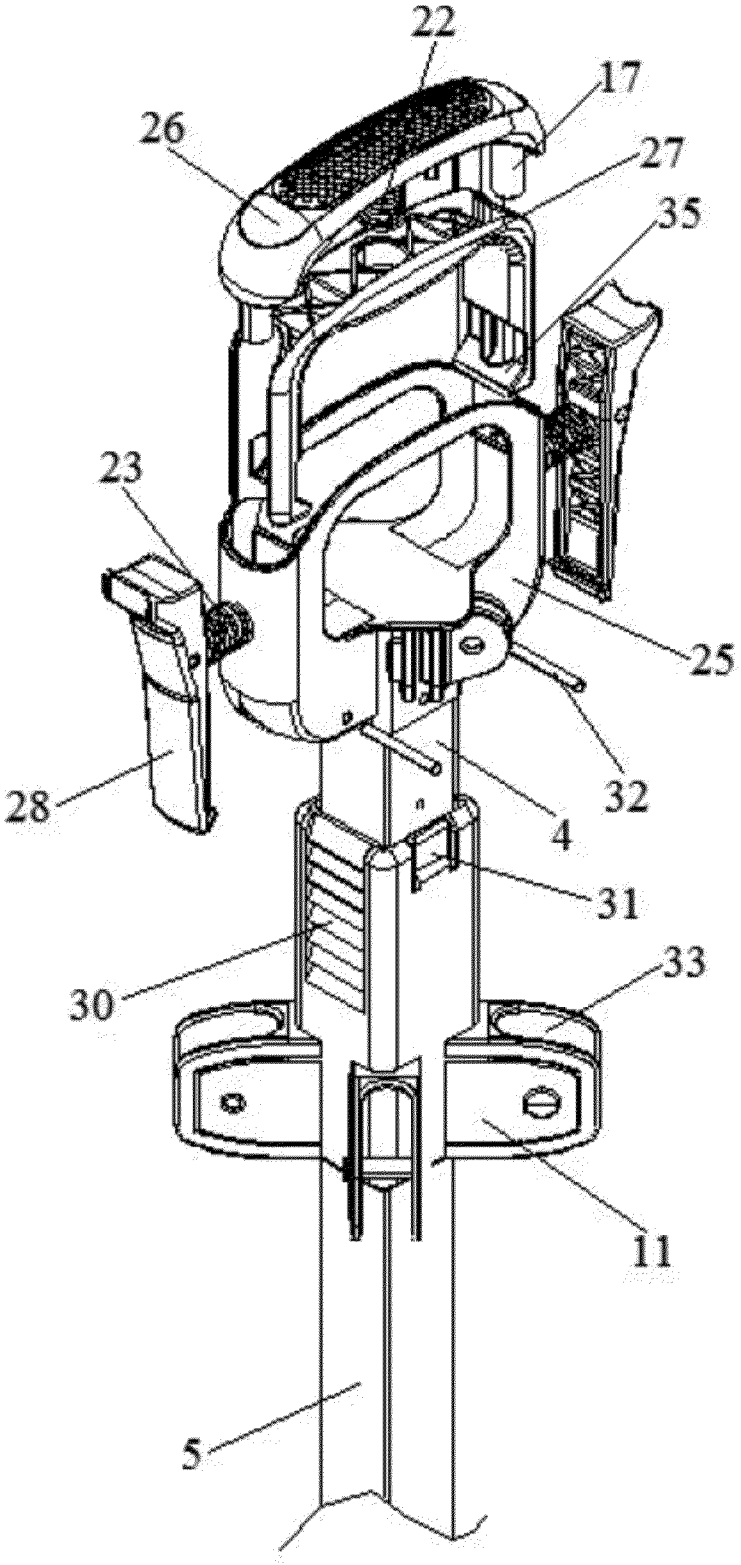

Figure 5

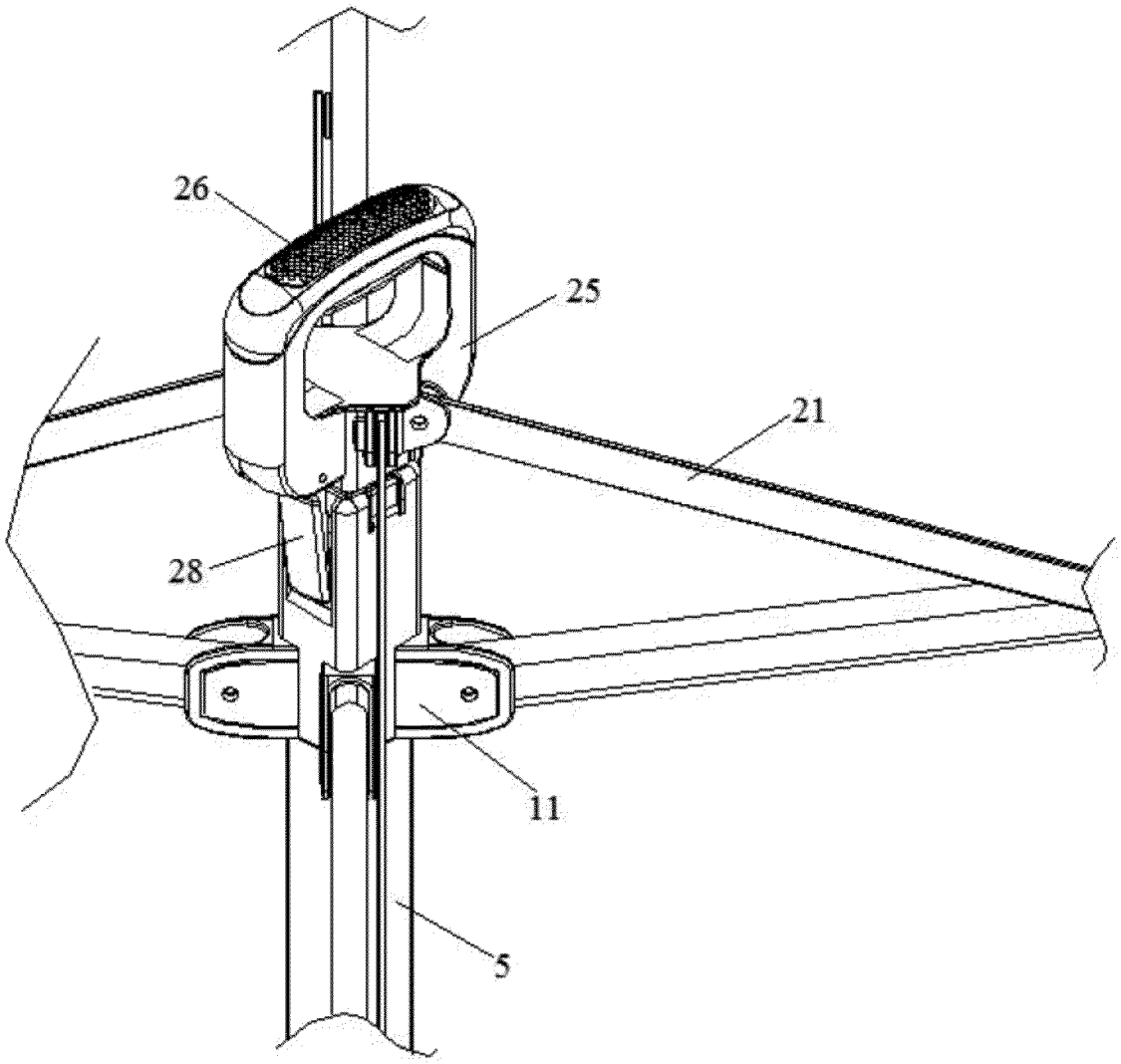

Figure 6

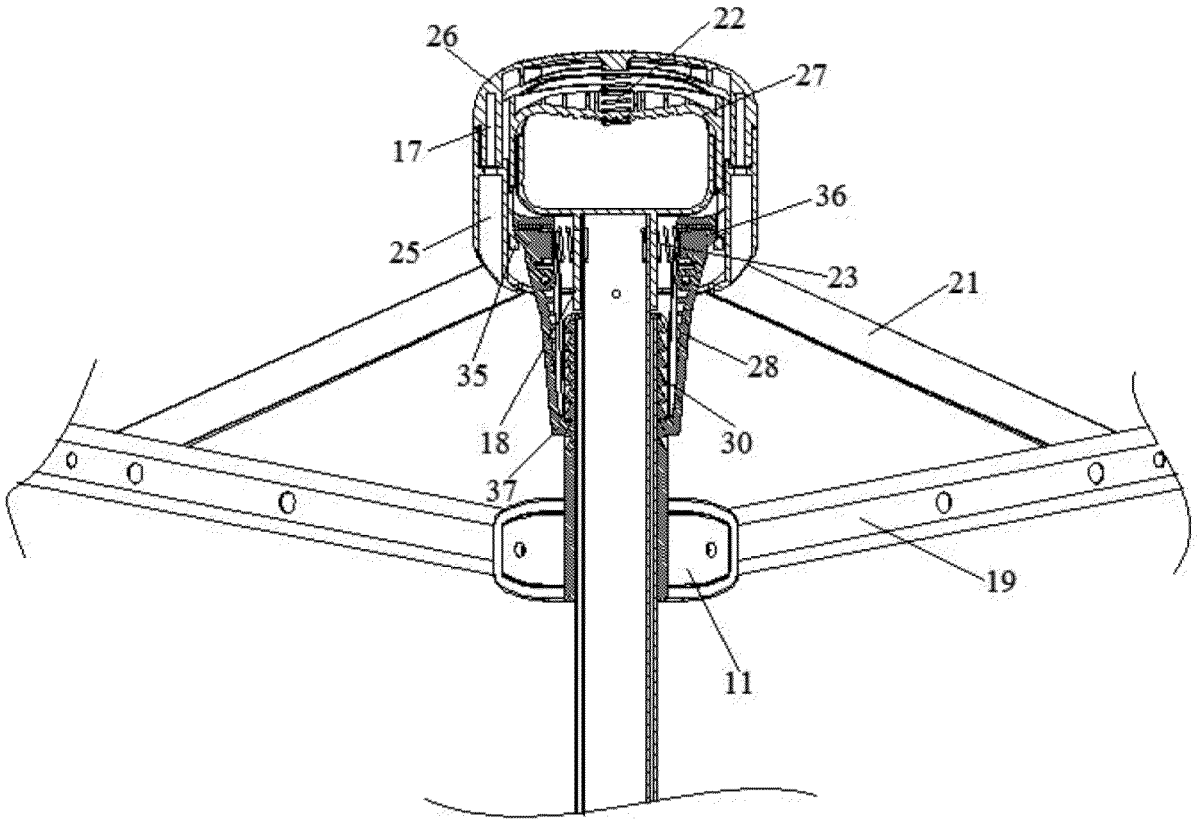

Figure 7

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EUROPEAN SEARCH REPORT

Application Number
EP 20 17 0233

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2012 103956 A1 (LEIFHEIT AG [DE]) 7 November 2013 (2013-11-07) * paragraph [0045] - paragraph [0050]; figures *	1-10	INV. D06F57/04
A	US 773 787 A (CROSSMAN ABNER [US] ET AL) 1 November 1904 (1904-11-01) * claim 1; figures *	1-10	
A	US 2017/086542 A1 (PAO CHIH-TING [TW]) 30 March 2017 (2017-03-30) * figures *	1-10	
A	GB 2 108 835 A (BRIAN JOHN) 25 May 1983 (1983-05-25) * figures *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

D06F
A47D
A47C
G05G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 May 2020	Diaz y Diaz-Caneja

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 17 0233

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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25-05-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82