(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 235 975 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.10.2017 Bulletin 2017/43

(51) Int Cl.:
E04H 4/08 *(2006.01)* ***A47K 3/00*** *(2006.01)*

(21) Application number: **16198187.3**

(22) Date of filing: **10.11.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **19.04.2016 CN 201620327143 U**

(71) Applicant: **He, Zhipeng**
Foshan Guangdong (CN)

(72) Inventor: **He, Zhipeng**
Foshan Guangdong (CN)

(74) Representative: **Karakatsanis, Georgios**
Haft Karakatsanis Patentanwaltskanzlei
Dietlindenstrasse 18
80802 München (DE)

(54) BATHTUB HEAT INSULATION COVER PULLED UP AND DOWN BY WIRE ROPE

(57) The invention discloses a bathtub heat insulation cover pulled up and down by a wire rope. A heat insulation cover body (1) is provided with a left lifting crossbar (21) and a right lifting crossbar (22), wherein the left lifting crossbar is fitted with a left lifter (31), and the right lifting crossbar is fitted with a right lifter (32); left guide grooves (313) are respectively formed on a front end and a rear end of the left side of the left lifter, and a front end and a rear end of the left lifting crossbar are respectively inserted in the left guide grooves at the corresponding side in a embedding manner; right guide grooves (323) are respectively formed on a front end and a rear end of the right side of the right lifter, and a front end and a rear end of the right lifting crossbar are respectively inserted in the right guide grooves at the corresponding side in a embedding manner; a middle crossbar (4) between the left lifter and the right lifter is provided with a lifting driving motor (5), and a left drive pulley (61) and a right drive pulley (62) which are driven by the lifting driving motor and move in reverse directions synchronously are arranged beside the middle crossbar; a left driving wire rope (71) which is connected with the left lifting crossbar is coiled on the left drive pulley, and a right driving wire rope (72) which is connected with the right lifting crossbar is coiled on the right drive pulley.

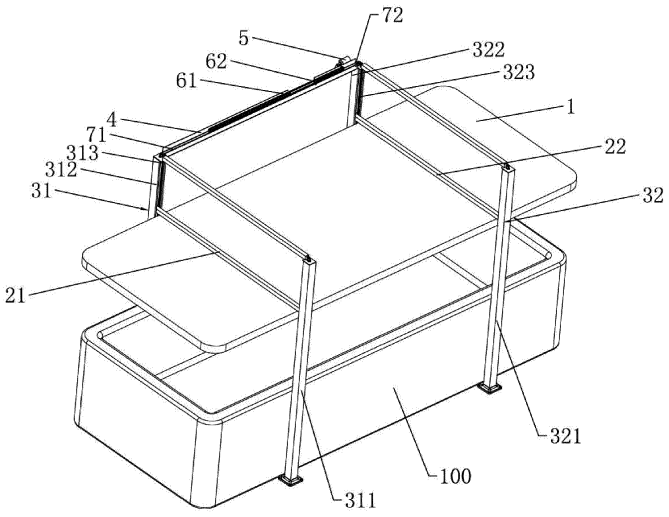


FIG.1

EP 3 235 975 A1

Description

Technical Field

[0001] The invention relates to the technical field of bathtubs, in particular to a bathtub heat insulation cover pulled up and down by a wire rope.

Background Art

[0002] Along with the constant economic and social development and progress as well as the constant improvement of the people's living standard, to take a tub bath has become a new experience for more and more families, and bathtubs have almost been universally adopted in hotels nowadays.

[0003] Along with the social development, modern bathtubs become bigger and bigger, particularly swimming bathtubs and large SPA bathtubs, so that heat insulation covers which are used for heat insulation also become bigger and bigger correspondingly. Once the heat insulation covers become large, their weight is also increased correspondingly, so the covers are difficult to open by one person, which bothers the users.

Disclosure of the Invention

[0004] The purpose of the invention is to provide a bathtub heat insulation cover which is pulled up and down by a wire rope in order to solve the defects of the prior art. The bathtub heat insulation cover which is pulled up and down by the wire rope has the advantages of novel design, high degree of automation and convenience in use.

[0005] The purpose of the invention is realized through the following technical solution.

[0006] A bathtub heat insulation cover which is pulled up and down by a wire rope comprises a heat insulation cover body arranged horizontally and transversely, wherein a left lifting crossbar arranged horizontally and transversely and extending in a front-and-rear direction is arranged on a left end of an upper surface of the heat insulation cover body, a right lifting crossbar arranged horizontally and transversely and extending in the front-and-rear direction is arranged on a right end of the upper surface of the heat insulation cover body, the left lifting crossbar is fitted with a left lifter, and the right lifting crossbar is fitted with a right lifter.

[0007] The left lifter comprises a left front vertical post which is arranged on a front end of the left lifting crossbar and arranged vertically and a left rear vertical post which is arranged on a rear end of the left lifting crossbar and arranged vertically, left guide grooves which extend vertically are respectively formed on the left front vertical post and the left rear vertical post, and a front end and a rear end of the left lifting crossbar are respectively inserted in the left guide grooves at the corresponding side in an embedding manner; the right lifter comprises a right front vertical post arranged on a front end of the right lifting crossbar and arranged vertically and a right rear vertical post arranged on a rear end of the right lifting crossbar and arranged vertically, right guide grooves which extend vertically are respectively formed on the right front vertical post and the right rear vertical post, and a front end and a rear end of the right lifting crossbar are respectively inserted in the right guide grooves at the corresponding side in an embedding manner.

[0008] A middle crossbar which is arranged horizontally and transversely and extends in a left-and-right direction is arranged between the left lifter and the right lifter, the middle crossbar is provided with a lifting driving motor and a left drive pulley and a right drive pulley which move in reverse directions synchronously are arranged beside the middle crossbar. The lifting driving motor is respectively connected with the left drive pulley and the right drive pulley in a driving way. A left driving wire rope is coiled on the left drive pulley, and both ends of the left driving wire rope are respectively connected with both ends of the left lifting crossbar. A right driving wire rope is coiled on the right drive pulley, and both ends of the right driving wire rope are respectively connected with both ends of the right lifting crossbar.

[0009] Wherein, the middle crossbar is provided with a chain transmission mechanism which is driven by the lifting driving motor, and the left drive pulley and the right drive pulley are respectively connected with the chain of the chain transmission mechanism.

[0010] Wherein, the middle crossbar is provided with a belt transmission mechanism which is driven by the lifting driving motor, and the left drive pulley and the right drive pulley are respectively connected with the belt of the belt transmission mechanism.

[0011] Wherein, the lifting driving motor is a direct current motor.

[0012] Wherein, the lifting driving motor is fitted with a control switch which is used for controlling forward and reverse rotation.

[0013] Wherein, the lifting driving motor is fitted with a remote control.

[0014] Wherein, the left lifter or the right lifter is provided with a travel switch.

[0015] The bathtub heat insulation cover which is pulled up and down by the wire rope has the beneficial effects that the left lifting crossbar and the right lifting crossbar are arranged on the upper surface of the heat insulation cover body;

the left lifting crossbar is fitted with the left lifter, and the right lifting crossbar is fitted with the right lifter; the left lifter comprises the left front vertical post and the left rear vertical post; the left guide grooves are respectively formed on the left front vertical post and the left rear vertical post, and the front end and the rear end of the left lifting crossbar are respectively inserted in the left guide grooves at the corresponding side in an embedding manner; the right lifter comprises the right front vertical post and the right rear vertical post; the right guides are respectively formed on the right front vertical post and the right rear vertical post, and the front end and the rear end of the right lifting crossbar are respectively inserted in the right guide at the corresponding side in an embedding manner; the middle crossbar between the left lifter and the right lifter is provided with the lifting driving motor, and the left drive pulley and the right drive pulley which move in reverse directions synchronously are arranged beside the middle crossbar; the lifting driving motor is respectively connected with the left drive pulley and the right drive pulley in the driving way; the left driving wire rope is coiled on the left drive pulley, and both ends of the left driving wire rope are respectively connected with both ends of the left lifting crossbar; and the right driving wire rope is coiled on the right drive pulley, and both ends of the right driving wire rope are respectively connected with both ends of the right lifting crossbar. With the above structural design, the bathtub heat insulation cover has the advantages of novel design, high degree of automation and convenience in use.

Brief Description of Drawings

[0016] Below is further description of the invention with drawings, but the embodiments in the figures do not constitute any restriction to the invention.

Fig. 1 is a structural representation of the invention.
Fig. 2 is a partial enlarged representation of the invention.

[0017] The follows are shown in Fig. 1 and Fig. 2:

1-Heat insulation cover body	21-Left lifting crossbar
22-Right lifting crossbar	31-Left lifter
311-Left front vertical post	312-Left rear vertical post
313-Left guide groove	32-Right lifter
321-Right front vertical post	322-Right rear vertical post
323-Right guide groove	4-Middle crossbar
5-Lifting driving motor	61-Left drive pulley
62-Right drive pulley	71-Left driving wire rope
72-Right driving wire rope	100-Bathtub.

Best Mode for Carrying out the Invention

[0018] Below is the description of the invention through the specific embodiments:

[0019] As shown in Figs. 1 and 2, a bathtub heat insulation cover which is pulled up and down by a wire rope comprises a heat insulation cover body 1 arranged horizontally and transversely, wherein a left lifting crossbar 21 arranged horizontally and transversely and extending in a front-and-rear direction is arranged on a left end of an upper surface of the heat insulation cover body 1, a right lifting crossbar 21 which is arranged horizontally and transversely and extending in the front-and-rear direction is arranged on a right end of the upper surface of the heat insulation cover body 1, the left lifting crossbar 21 is fitted with a left lifter 31, and the right lifting crossbar 22 is fitted with a right lifter 32.

[0020] Furthermore, the left lifter 31 comprises a left front vertical post 311 which is arranged on a front end of the left lifting crossbar 21 and arranged vertically and a left rear vertical post 312 which is arranged on a rear end of the left lifting crossbar 21 and arranged vertically. Left guide grooves 313 which extend vertically are respectively formed on the left front vertical post 311 and the left rear vertical post 312, and a front end and a rear end of the left lifting crossbar 21 are respectively inserted in the left guides 313 at the corresponding side in an embedding manner. The right lifter 32 comprises a right front vertical post 321 which is arranged on a front end of the right lifting crossbar 22 and arranged vertically and a right rear vertical post 322 which is arranged on a rear end of the right lifting crossbar 22 and arranged vertically; right guide grooves 323 which extend vertically are respectively formed on the right front vertical post 321 and the right rear vertical post 322, and a front end and a rear end of the right lifting crossbar 22 are respectively inserted in the right guides 323 at the corresponding side in an embedding manner.

[0021] Moreover, a middle crossbar 4 which is arranged horizontally and transversely and extends in a left-and-right direction is arranged between the left lifter 31 and the right lifter 32, the middle crossbar 4 is provided with a lifting driving

motor 5, and a left drive pulley 61 and a right drive pulley 62 which move in reverse directions synchronously are arranged beside the middle crossbar 4; the lifting driving motor 5 is respectively connected with the left drive pulley 61 and the right drive pulley 62 in the driving way; a left driving wire rope 71 is coiled on the left drive pulley 61, and both ends of the left driving wire rope 71 are respectively connected with both ends of the left lifting crossbar; and a right driving wire rope 72 is coiled on the right drive pulley 62, and both ends of the right driving wire rope 72 are respectively connected with both ends of the right lifting crossbar 22.

[0022] Wherein, the middle crossbar 4 is provided with a chain transmission mechanism which is driven by the lifting driving motor 5, and the left drive pulley 61 and the right drive pulley 62 are respectively connected with the chain of the chain transmission mechanism; or the middle crossbar 4 is provided with a belt transmission mechanism which is driven by the lifting driving motor 5, and the left drive pulley 61 and the right drive pulley 62 are respectively connected with the belt of the belt transmission mechanism.

[0023] During the use of the bathtub heat insulation cover, when a user wants to open the heat insulation cover body 1, the lifting driving motor 5 drives the left drive pulley 61 to move to the right and drive the right drive pulley 62 to move to the left through the chain transmission mechanism or the belt transmission mechanism; the left drive pulley 61 which moves to the right pulls the left driving wire rope 71 to move to the left, and the left lifting crossbar 21 is pulled by the left driving wire rope 71 to move up along the left guide 313. During the process, the right drive pulley 62 which moves to the left pulls the right driving wire rope 72 to move to the left, and the right lifting crossbar 22 is pulled by the right driving wire rope 72 to move up along the right guide 323; at this time, the left lifting crossbar 21 and the right lifting crossbar 22 move up synchronously, and the left lifting crossbar 21 and the right lifting crossbar 22 drive the heat insulation cover body 1 to move up, so as to open the heat insulation cover body 1.When the user wants to re-cover the heat insulation cover body 1, the lifting driving motor 5 rotates reversely, the left drive pulley 61 moves to the left and the right drive pulley 62 moves to the right. During the process, the left driving wire rope 71 releases the left lifting crossbar 21 and allows the left lifting crossbar 21 to move down, and the right driving wire rope 72 releases the right lifting crossbar 22 and allows the right lifting crossbar 22 to move down; the left lifting crossbar 21 and the right lifting crossbar 22 which move synchronously drive the heat insulation cover body 1 to move down, and finally the heat insulation cover body 1 is covered on the bathtub100.

[0024] It should be further explained that guide grooves are respectively formed on inner sides (the sides close to the bathtub100) of the respective vertical posts of the left lifter and the right lifter, and the guide grooves play a role of fixing moving directions of the lifting crossbars, so that the heat insulation cover body 1 does not shake greatly; wherein, the wire rope may be hidden within the guide groove at the corresponding side, so as to satisfy the protecting and pleasing needs.

[0025] It should be further noted that a direct current motor is adopted for the lifting driving motor 5 in Embodiment 1, wherein the lifting driving motor 5 may control the forward and reverse rotation through a control switch or through a remote control. Wherein, the left lifter 31 or the right lifter 32 is provided with a travel switch, i.e. in Embodiment 1, lifting and stopping positions of the heat insulation cover body 1 may be set through the travel switch.

[0026] Wherein, in addition to the bathtubs 100, the bathtub heat insulation cover may be applied to small swimming pools.

[0027] To sum up, with the structural design, the bathtub heat insulation cover has the advantages of novel design, high degree of automation and convenience in use.

[0028] The above-mentioned are only preferred embodiments of the invention. The ordinary skilled in the art may make modifications to the specific embodiments and the application scope thereof according to the idea of the invention, and the contents of the Specification shall not be understood as the restriction to the invention.

Claims

1. A bathtub heat insulation cover pulled up and down by a wire rope is **characterized by** comprising a heat insulation cover body (1) which is arranged horizontally, wherein a left lifting crossbar (21) arranged horizontally and transversely and extending in a front-and-rear direction is arranged on a left end of an upper surface of the heat insulation cover body (1), a right lifting crossbar (22) arranged horizontally and transversely and extending in a front-and-rear direction is arranged on a right end of the upper surface of the heat insulation cover body (1), the left lifting crossbar (21) is fitted with a left lifter (31), and the right lifting crossbar (22) is fitted with a right lifter (32);
the left lifter (31) comprises a left front vertical post (311) which is arranged on a front end of the left lifting crossbar (21) and arranged vertically and a left rear vertical post (312) which is arranged on a rear end of the left lifting crossbar (21) and arranged vertically, left guide grooves (313) which extend vertically are respectively formed on the left front vertical post (311) and the left rear vertical post (312), and a front end and a rear end of the left lifting crossbar (21) are respectively inserted in the left guide grooves (313) at the corresponding side in an embedding manner; the right lifter (32) comprises a right front vertical post (321) which is arranged on a front end of the right

lifting crossbar (22) and arranged vertically and a right rear vertical post (322) which is arranged on a rear end of the right lifting crossbar (22) and arranged vertically, right guide grooves (323) which extend vertically are respectively formed on the right front vertical post (321) and the right rear vertical post (322), and a front end and a rear end of the right lifting crossbar (22) are respectively inserted in the right guide grooves (323) at the corresponding side in an embedding manner;

a middle crossbar (4) arranged horizontally and transversely and extending in a left-and-right direction is arranged between the left lifter (31) and the right lifter (32), the middle crossbar (4) is provided with a lifting driving motor (5), a left drive pulley (61) and a right drive pulley (62) which move in reverse directions synchronously are arranged beside the middle crossbar (4), the lifting driving motor (5) is respectively connected with the left drive pulley (61) and the right drive pulley (62) in a driving way; a left driving wire rope (71) is coiled on the left drive pulley (61), and both ends of the left driving wire rope (71) are respectively connected with both ends of the left lifting crossbar; a right driving wire rope (72) is coiled on the right drive pulley (61), and both ends of the right driving wire rope (72) are respectively connected with both ends of the right lifting crossbar (22).

2. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the middle crossbar (4) is provided with a chain transmission mechanism driven by the lifting driving motor (5); the left drive pulley (61) and the right drive pulley (62) are respectively connected with the chain of the chain transmission mechanism.

3. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the middle crossbar (4) is provided with a belt transmission mechanism which is driven by the lifting driving motor (5); the left drive pulley (61) and the right drive pulley (62) are respectively connected with the belt of the belt transmission mechanism.

4. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the lifting driving motor (5) is a direct current motor.

5. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the lifting driving motor (5) is fitted with a control switch which is used for controlling forward and reverse rotation.

6. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the lifting driving motor (5) is fitted with a remote control.

7. The bathtub heat insulation cover pulled up and down by the wire rope according to claim 1, is **characterized in that** the left lifter (31) or the right lifter (32) is provided with a travel switch.

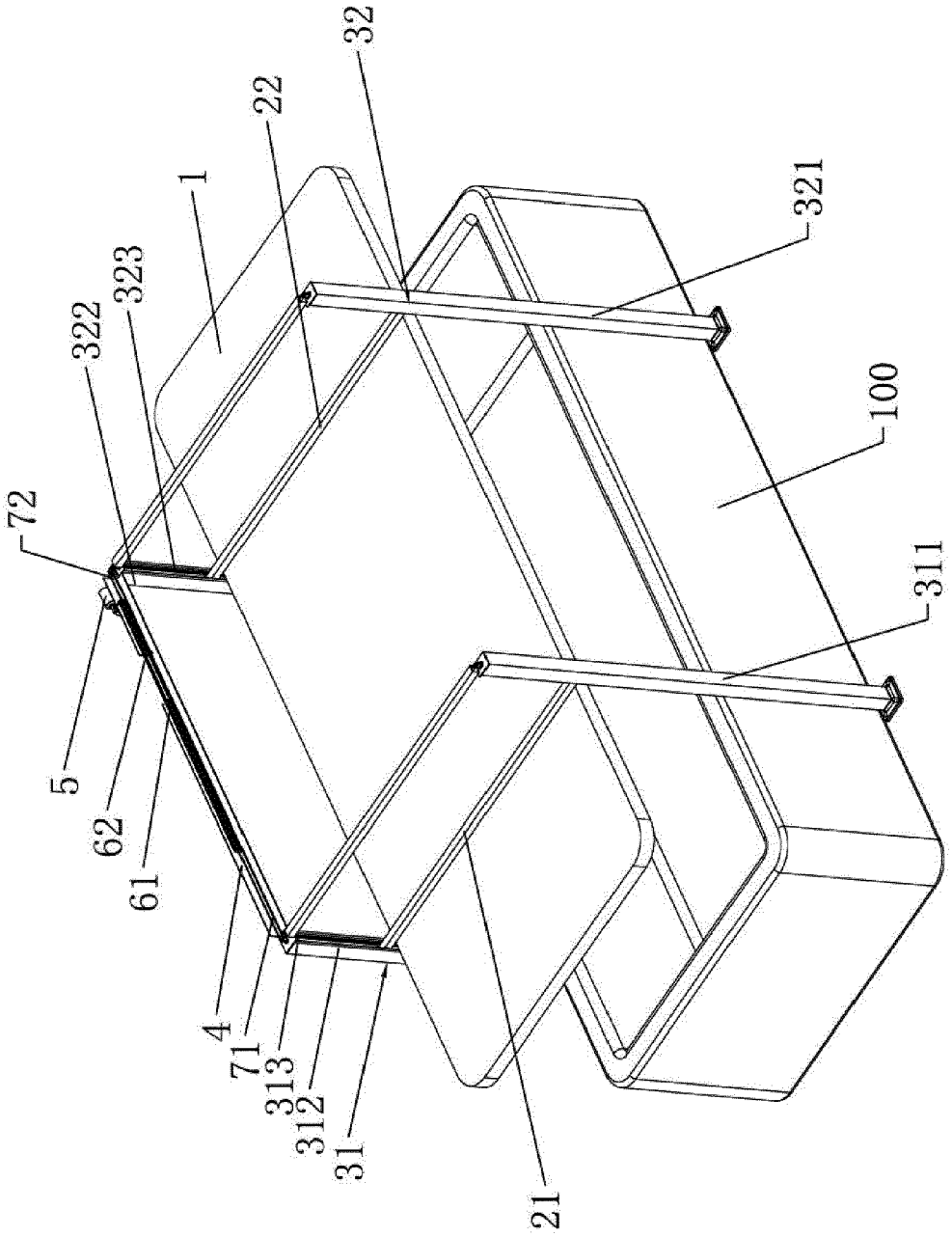


FIG.1

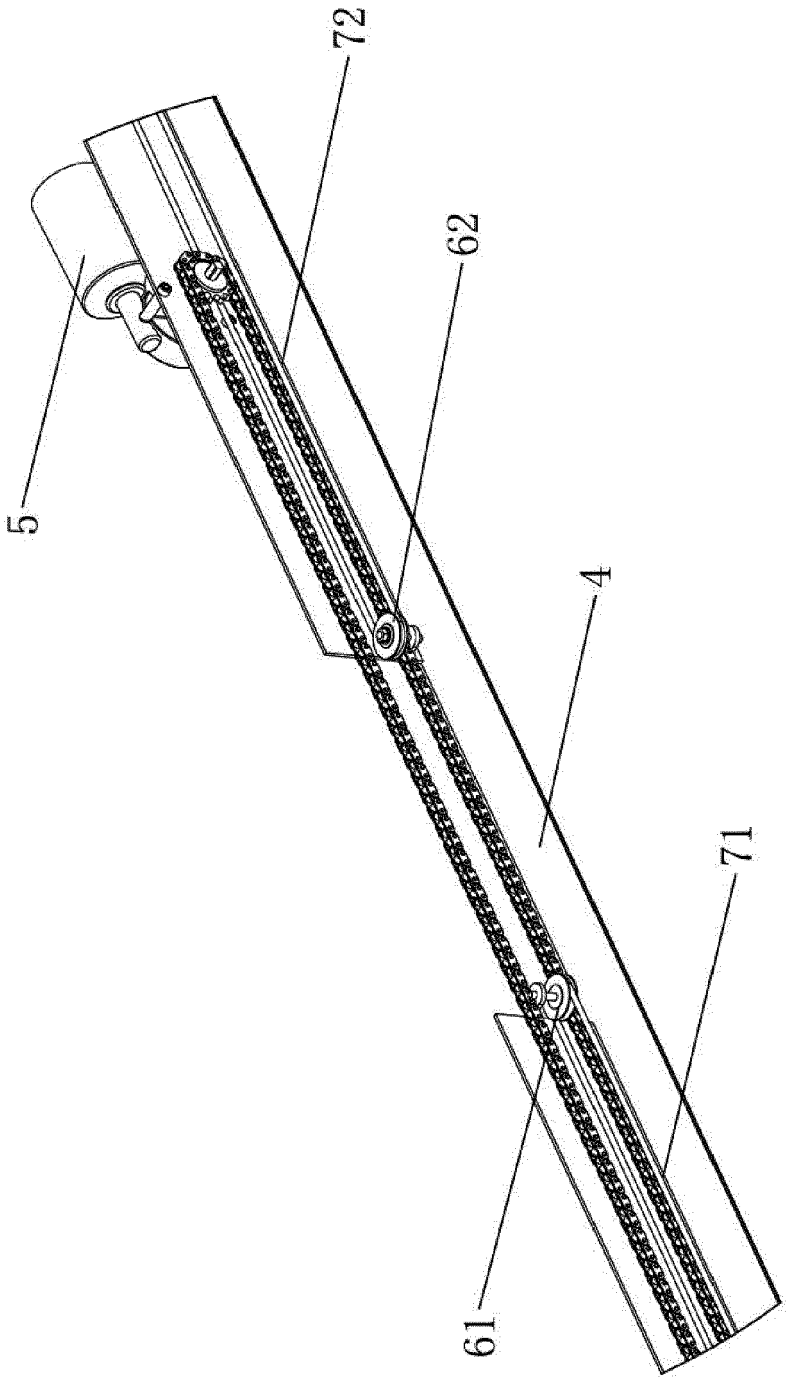


FIG.2

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 19 8187

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 201 12 711 U1 (ISERT HORST [DE]; ISERT JOERG CHRISTIAN [DE]) 20 December 2001 (2001-12-20) * page 1; figures 1-5 * -----	1-7	INV. E04H4/08 A47K3/00
A	US 2011/113546 A1 (IOSIM MARK [US]) 19 May 2011 (2011-05-19) * paragraphs [0028] - [0054]; figures 1, 4, 5, 6, 7, 8, 9 * -----	1-7	
A	GB 2 428 701 A (STERLING HOLDINGS CORP [CA]) 7 February 2007 (2007-02-07) * figures 1-8 * -----	1-7	

TECHNICAL FIELDS SEARCHED (IPC)

E04H
A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 July 2017	Decker, Robert

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 16 19 8187

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-07-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 20112711 U1	20-12-2001	NONE	
US 2011113546 A1	19-05-2011	NONE	
GB 2428701 A	07-02-2007	CA 2519311 A1	23-01-2007
		GB 2428701 A	07-02-2007
		US 2007017016 A1	25-01-2007
		US 2007017017 A1	25-01-2007

EPO FORM P0459

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