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(54) **A LOCKING SAFETY COVER FOR AN ELECTRONIC CIGARETTE ATOMIZER, AN ELECTRONIC CIGARETTE ATOMIZER WITH A SAFETY COVER AND METHODS FOR USING THE SAME**

GEWINDESICHERHEITSDECKEL FÜR EINEN ELEKTRONISCHEN ZIGARETTENZERSTÄUBER,
ELEKTRONISCHER ZIGARETTENZERSTÄUBER MIT EINER SICHERHEITSABDECKUNG UND
VERFAHREN ZUR VERWENDUNG DAVON

COUVERCLE DE SÉCURITÉ DE VERROUILLAGE POUR UN ATOMISEUR DE CIGARETTE
ÉLECTRONIQUE, ATOMISEUR DE CIGARETTE ÉLECTRONIQUE AVEC CAPOT DE SÉCURITÉ
ET PROCÉDÉS D'UTILISATION DE CELUI-CI

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Description

Technical Field

[0001] The present invention relates to a locking safety cover for an electronic cigarette atomizer, an electronic cigarette atomizer with said safety cover, and methods for using the same.

Background Art

[0002] For a traditional cigarette, what is inhaled is the smoke produced when tobacco cigarettes burn. It is well known that smoke does great harm to the health of human beings. Smoking is forbidden in more and more public places, for example, workplaces and mass transit systems, all over the world. Many are very fond of cigarettes. It is impossible to eradicate the harm of cigarettes quickly and it will take some time to completely quit smoking.

[0003] For this reason, a cigarette substitute, which can not only maintain the smoking feeling, but also minimize the harm, is available in the market. Electronic cigarettes use an electronic atomizer to atomize a cigarette liquid (e-liquid) or other chemical substances to create an aerosolized vapor. The user inhales the aerosol, commonly called vapor, rather than cigarette smoke produced by burning cigarettes. The electronic cigarette provides a flavor and feel similar to tobacco smoking, or even much more than those of ordinary tobacco cigarettes. However, electronic cigarettes do not contain any tar, suspended solid particles, or other harmful ingredients contained in cigarette smoke, or produce diffusing second-hand smoke.

[0004] Electronic cigarettes usually consist of a control box consisting of a battery and a control printed circuit board, connected with other components such as an atomizer and a cigarette holder (Mouthpiece). For the general structure of the electronic cigarette atomizer, a round atomization core and a connecting tube are set at the center of an enclosed circular space, and the remaining circular space is used to contain an electronic cigarette liquid. The atomization core and the connecting tube are enclosed, too, except that two symmetrical liquid inlet holes are opened on the exterior wall of the atomization core and are used to supply a cigarette liquid (e-liquid) to the atomization core. The atomization core is connected to the control box and is heated to atomize the cigarette liquid (e-liquid) entering the atomization core, and the atomized cigarette liquid is exhaled out of the connecting tube.

[0005] The atomizer is the major component of electronic cigarettes. The currently known electronic cigarettes usually consist of a base, an atomization core, and a cartridge. The cartridge consists of an inner tube, an outer tube, an upper cover, and a fixed seat. A circular space is formed between the inner tube and the outer tube, and the upper cover and the fixed seat enclose the circular space to contain a cigarette liquid. A cigarette

holder hole is set at the center of the upper cover and is used to connect the cigarette holder and the inner tube.

[0006] Generally, snap connection or thread connection is adopted for the upper cover of the prior art atomizer. A thread matching the atomizer body is set on the thread-connected upper cover and the upper cover is sealed by screwing it up. The thread connected structure has a defect which cannot be overcome. In the situation that the upper cover is screwed up, since the thread is screwed up unidirectionally, the upper cover may be screwed off by accident. Thus, the sealing of the electronic cigarette atomizer is easily affected so that the liquid leaks out of the upper cover or even the upper cover falls off.

[0007] When a thread-connected structure is used in the electronic cigarette field or many other fields, the user may screw off the thread by accident to cause trouble in use.

[0008] To overcome the above-mentioned defect, the present invention designs a new locking device and the locking device is applied to the upper cover of the electronic cigarette atomizer.

[0009] US 2014/290674 A1 relates to an electronic cigarette which does not form sharp angles and is preventing from hurting users' bodies.

Summary of the Invention

[0010] The present invention is intended to provide a locking safety cover for an electronic cigarette atomizer according to claim 1, which can prevent a thread from being screwed off by accident in a thread connection situation.

[0011] The present invention is further intended to provide an electronic cigarette atomizer with the above-mentioned safety cover and to an electronic cigarette comprising the same electronic cigarette atomizer.

[0012] Methods for using the locking safety cover for an electronic cigarette atomizer and said electronic cigarette according to claims 14 and 15 are also provided.

[0013] The locking safety cover in the present invention comprises a circular fixing component, a circular rotary component, and a circular connecting component. Said circular fixing component and circular connecting component are fixedly connected, said circular rotary component is set between the circular fixing component and the circular connecting component, and said circular rotary component can rotate around the axis of the thread-locking device and slide along said axis. At least a concave and convex block locking mechanism is set on the end faces of the circular rotary component and the circular connecting component so that a joint rotation state and an independent rotation state exist between the circular connecting component and the circular rotary component.

[0014] The concave and convex block locking mechanism of said circular rotary component and circular connecting component comprises a convex block set on the

end face on one side of the contact surface between the above-mentioned two components and a concave set on the end face on the other side of the contact surface, and said concave has at least a horizontal bottom and an inclined bottom.

[0015] Said convex block is set on the circular rotary component, and said concave is set on the circular connecting component.

[0016] The locking safety cover for an electronic cigarette atomizer in the present invention comprises a fixing ring, an upper cover, and a thread ring. Said fixing ring and thread ring are fixedly connected, the upper cover is set between the fixing ring and the thread ring, and the upper cover can rotate around axis of the locking safety cover and slide along said axis. A concave and convex block locking mechanism is set between the lower end face of said upper cover and the upper end face of said thread ring so that a joint rotation state and an independent rotation state exist between the upper cover and the thread ring.

[0017] The concave and convex block locking mechanism of said upper cover and thread ring comprises a convex block set on the end face on one side of the contact surface between the upper cover and the thread ring and a concave set on the end face on the other side of the contact surface, and said concave has at least a horizontal bottom and an inclined bottom.

[0018] The convex block used for locking is set on the lower end face of said upper cover, the concave used for locking is set on the upper end face of said thread ring, said concave has preferably a horizontal bottom and an inclined bottom.

[0019] A connecting thread is set on the lower segment of said thread ring to thread connect the electronic cigarette atomizer.

[0020] The electronic cigarette atomizer with a safety cover in the present invention comprises an atomizer body and a safety cover, where the safety cover and the atomizer body are thread connected. Said safety cover comprises a fixing ring, an upper cover, and a thread ring. Said fixing ring and thread ring are fixedly connected, the upper cover is set between the fixing ring and the thread ring, and the upper cover can rotate around the axis of the locking safety cover and slide along said axis. A concave and convex block locking mechanism is set between the lower end face of said upper cover and the upper end face of said thread ring so that a joint rotation state and an independent rotation state exist between the upper cover and the thread ring. Said thread ring is fixedly thread connected to the atomizer body.

[0021] The concave and convex block locking mechanism of said upper cover and thread ring comprises a convex block set on the end face on one side of the contact surface between the upper cover and the thread ring and a concave set on the end face on the other side of the contact surface, and said concave has at least a horizontal bottom and an inclined bottom.

[0022] A convex block used for locking is set on the

lower end face of said upper cover, and a concave used for locking is set on the upper end face of said thread ring. Said concave has preferably a horizontal bottom and an inclined bottom. A connecting thread is set on the lower segment of said thread ring to thread connect the electronic cigarette atomizer body.

[0023] In the present invention, a rotary component which can rotate together with a connecting component or rotate independently is set in a thread connected structure. Unidirectional locking between the rotary component and the connecting component is implemented through the concave and convex block locking mechanism to prevent the connecting component and the connecting body from being screwed off by accident.

Brief Description of the Drawings

[0024]

Figure 1 shows the exploded structure of the electronic cigarette atomizer with a safety cover in the present invention.

Figure 2 shows the structure of the upper cover of the electronic cigarette atomizer in the present invention.

Figure 3 shows the profile structure of the safety cover of the electronic cigarette atomizer in the present invention.

Figure 4 shows the profile structure of the electronic cigarette atomizer with a safety cover in the present invention.

Figure 5 shows the structure of the thread-locking device in the present invention.

[0025] Description of reference numbers in the drawings: 1. Fixing ring 2. Upper cover 3. First sealing ring 4. Thread ring 5. Second sealing ring 6. Atomizer body 21. Convex block on the upper cover 41. Concave on the thread ring 42. Connecting thread 43. Horizontal bottom 44. Inclined bottom.

Detailed Description of the Invention

[0026] The following describes in detail the structures in the present invention in combination with drawings and embodiments. The drawings and embodiments are used only to describe the present invention, but are not used to restrict the protection scope of the present invention.

[0027] Figure 1 and Figure 5 show the exploded 3D structure of the electronic cigarette atomizer using a safety cover of the present invention. The atomizer in the present invention comprises an atomizer body (6) and a safety cover assembly. The safety cover assembly is set at the top of the atomizer body (6) and is used to lock and seal the top of the atomizer body (6).

[0028] As shown in Figure 1, the atomizer comprises the fixing ring (1), the upper cover (2), the first sealing ring (3), the thread ring (4), the second sealing ring (5),

and the atomizer body (6) in turn from the top down. Where, the components from the fixing ring (1) to the thread ring (4) form the safety cover assembly. The whole safety cover assembly is locked together with the atomizer body (6) through the connecting thread (42) set on the lower part of the thread ring.

[0029] As shown in Figure 3, the fixing ring (1) and the thread ring (4) are fixed together through an interference fit from the interior wall of the thread ring, a connecting clearance is set, the contour of the fixing ring (1) is T-shaped, the upper cover (2) is set in the connecting clearance, that is to say, the inside diameter of the upper cover (2) is smaller than the outside diameter of the top of the T-shaped fixing ring (1), and the top of the fixing ring (1) can lock the upper cover (2) in the connecting clearance between the fixing ring (1) and the thread ring (4). Such a structure can allow the upper cover (2) to rotate around the axis of the safety cover assembly (thread-locking device) and make movements within a limited distance along the axis, that is to say, slide upward and downward within a limited distance.

[0030] As shown in Figure 2, Figure 3, and Figure 4, the lower end face of said upper cover (2) and the upper end face of said thread ring (4) can be in a relative rotation state. The convex blocks (21) protruding from the end face are set on the lower end face of the upper cover (2), a multiple of concaves (41) corresponding to the convex blocks are set on the upper end face of the thread ring (4), and preferably four convex blocks (21) and four concaves (41) are respectively set. As shown in Figure 4, the bottom of the concave (41) is preferably set into two parts. One part is a horizontal bottom (43), and the other part is an inclined bottom (44). Such a structure makes it possible that when the upper cover (2) is screwed left, the convex block (21) is snapped into the concave (41) and does not get out of it, and then drives the thread ring (4) to rotate left. In this case, the thread ring (4) and the safety cover are screwed up. When the upper cover (2) is screwed right by accident, meaning naturally screwing right without applying a pressure to the upper cover, the inclined bottom (44) in the concave (41) will eject the convex block (21) out of the concave (41) to lift the upper cover (2) so that the upper cover (2) makes idle rotations relative to the thread ring (4) and the safety cover will not be opened. When it is necessary to open the safety cover, screw the upper cover (2) right and simultaneously press the upper cover. Under the action of the pressure, the convex block (21) will not get out of the concave (41), and the upper cover (2) drives the thread ring (4) to rotate, and then the safety cover is screwed off.

[0031] As shown in Figure 1 and Figure 3, since the present invention is used for electronic cigarettes, sealing measures need to be taken to avoid a cigarette liquid from leaking from the atomizer. The second sealing ring (5) shown in the figures is set on the connecting portion of the thread ring (4) and the atomizer body (6) to seal the connecting portion and avoid the cigarette liquid from leaking. In addition, the first sealing ring (3) is set between

the outside of the fixing ring (1) and the inside of the upper cover (2). Since the upper cover (2) is set in the clearance formed between the fixing ring (1) and the thread ring (4) and the upper cover can rotate and move upward and downward within the clearance, the first sealing ring (3) should first guarantee the tightness, and should secondly guarantee the rotations and movements of the upper cover (2) within the elasticity range of the sealing ring to avoid abnormal noise between the upper cover (2) and the fixing ring (1).

[0032] When the above-mentioned structures are assembled, it is necessary to guarantee that the upper cover (2) has an upward and downward movement space slightly greater than the height of the convex block (21).

[0033] As shown in Figure 4, in said thread-locking device in the present invention, the fixing ring (1) can serve as the circular fixing component, the upper cover (2) can serve as the circular rotary component, the thread ring (4) can serve as the circular connecting component. At the time of installation, the circular fixing component is fixed to the circular connecting component, and the circular rotary component is locked in the clearance formed between the circular fixing component and the circular connecting component. In addition, protruding convex blocks (21) are set on the lower end face of the circular rotary component, concaves (41) are set on the upper end face of the circular connecting component, and preferably a horizontal bottom (43) and an inclined bottom (44) are set on the concaves (41). Through the configuration of the convex blocks (21) and the concaves (41), the joint rotation state and the independent rotation state can be implemented between the circular connecting component and the circular rotary component. When the circular rotary component is screwed left, the convex blocks (21) snapped into the concaves (41) can implement the joint rotation of the circular connecting component and the circular rotary component and the thread on the circular connecting component can be screwed up. When the circular rotary component is naturally screwed right, the inclined bottom (44) will raise the convex blocks (21) along the inclined bottom (44) until the convex blocks get out of the concaves (41) so that the circular rotary component will not drive the circular connecting component to rotate jointly and the circular connecting component will still be screwed tightly on the connecting body. If a pressure is applied to the circular rotary component while the circular rotary component is screwed right, owing to the existence of the pressure, the convex blocks (21) will not rise along the inclined bottom (44) and will drive the circular rotary component to rotate jointly and screw off the device.

Claims

1. A locking safety cover for an electronic cigarette atomizer to prevent a thread from being screwed off by accident in a thread connection situation, **char-**

acterized in that said cover comprises:

- a circular fixing component (1),
- a circular rotary component (2), and
- a circular connecting component (4),

wherein said circular fixing component and said circular connecting component are fixedly connected, said circular rotary component is set between the circular fixing component and the circular connecting component,

wherein said circular rotary component is configured to rotate around the axis of the locking safety cover and slide along said axis, at least a concave and convex block locking mechanism (21, 41) is set on the end faces of the circular rotary component and the circular connecting component so that a joint rotation state and an independent rotation state exist between the circular connecting component and the circular rotary component.

2. The locking safety cover of claim 1, **characterized in that** said concave and convex block locking mechanism of the circular rotary component and the circular connecting component comprises

- a convex block (21) set on the end face on one side of the contact surface between said circular rotary component and said circular connecting component, and
- a concave (41) set on the end face on the other side of the contact surface, wherein said concave has at least a horizontal bottom and an inclined bottom.

3. The locking safety cover of claim 2, **characterized in that** said convex block (21) is set on the circular rotary component, and said concave (41) is set on the circular connecting component.

4. The locking safety cover according to any one of claims 1 to 3, wherein:

- a fixing ring (1) corresponding to the circular fixing component,
- an upper cover (2) corresponding to the circular rotary component, and
- a thread ring (4) corresponding to the circular connecting component.

5. The locking safety cover of claim 4, **characterized in that** said convex block (21) used for locking is set on the lower end face of said upper cover, the concave (41) used for locking is set on the upper end face of said thread ring, said concave has preferably a horizontal bottom and an inclined bottom.

6. The locking safety cover of claim 4 or 5, **character-**

ized in that the fixing ring (1) and the thread ring (4) are fixed together through an interference fit from the interior wall of the thread ring with a connecting clearance, the contour of the fixing ring (1) is T-shaped.

7. The locking safety cover of claim 6, **characterized in that** the upper cover (2) is set in the connecting clearance, that is to say, the inside diameter of the upper cover (2) is smaller than the outside diameter of the top of the T-shaped fixing ring (1), and the top of the fixing ring (1) is configured to lock the upper cover (2) in the connecting clearance between the fixing ring (1) and the thread ring (4).

8. The locking safety cover according to any one of claims 4 to 7, **characterized in that** the lower end face of said upper cover (2) and the upper end face of said thread ring (4) are configured to be in a relative rotation state.

9. The locking safety cover according to any one of claims 4 to 8, **characterized in that** four concave and convex block locking mechanisms including four convex blocks (21) and four concaves (41) are respectively set.

10. The locking safety cover according to any one of claims 4-9, **characterized in that** a connecting thread is set on the lower segment of said thread ring to thread connect the electronic cigarette atomizer, or **in that** the upper cover (2) has an upward and downward movement space slightly greater than the height of the convex block (21).

11. An electronic cigarette atomizer comprising an atomizer body (6) and the safety cover of any one of claims 4-10, wherein the safety cover is set at the top of the atomizer body (6) and is used to lock and seal the top of the atomizer body (6), and wherein the safety cover and the atomizer body are thread connected.

12. The electronic cigarette atomizer according to claim 11, wherein a first sealing ring (3) is set between the outside of the fixing ring (1) and the inside of the upper cover (2), and a second sealing ring (5) is set on the connecting portion of the thread ring (4) and the atomizer body (6) to seal the connecting portion and avoid the cigarette liquid from leaking.

13. An electronic cigarette, **characterized in that** said electronic cigarette comprises the electronic cigarette atomizer according to claim 11 or 12.

14. Method for using the locking safety cover for an electronic cigarette atomizer to prevent a thread from being screwed off by accident in a thread connection

situation according to anyone of claims 1 to 10, comprising steps of:

- screwing up the cover by screwing left the circular rotary component, the convex blocks (21) snapped into the concaves (41) implements a joint rotation of the circular connecting component and the circular rotary component, the thread on the circular connecting component is screwed up;
- screwing off the cover by screwing right the circular rotary component while applying a pressure to the circular rotary component, so that the convex blocks (21) rises along the inclined bottom (44) and drives the circular rotary component to rotate jointly and screw off the cover,

wherein when the circular rotary component is naturally screw right without applying a pressure to the circular rotary component, the inclined bottom (44) raises the convex blocks (21) along the inclined bottom (44) until the convex blocks get out of the concaves (41), so that the circular rotary component does not drive the circular connecting component to rotate jointly, and the circular connecting component is still screwed tightly on the connecting body.

15. Method for using the electronic cigarette atomizer according to claim 11 or 12, comprising steps of:

- screwing up the locking safety cover by screwing left the upper cover, the convex block (21) is snapped into the concave (41) and does not get out of it, and then drives the thread ring (4) to rotate left, the thread ring (4) and the safety cover is screwed up;
- screwing off locking safety cover by screwing right and simultaneously pressing the upper cover (2), the convex block (21) does not get out of the concave (41), and the upper cover (2) drives the thread ring (4) to rotate, then the safety cover is screwed off,

wherein when the upper cover (2) is naturally screwed right without applying a pressure to the upper cover, the inclined bottom (44) in the concave (41) ejects the convex block (21) out of the concave (41) to lift the upper cover (2), so that the upper cover (2) makes idle rotations relative to the thread ring (4) and the safety cover is not opened.

Patentansprüche

- 1.** Eine verriegelnde Sicherheitsabdeckung für einen elektronischen Zigarettenzerstäuber, um zu verhindern, dass ein Gewinde in einer Gewindeverbindungssituation versehentlich abgeschraubt wird,

dadurch gekennzeichnet, dass die Abdeckung Folgendes umfasst:

- eine kreisförmige Befestigungskomponente (1),
- eine kreisförmige Drehkomponente (2) und
- eine kreisförmige Verbindungskomponente (4),

wobei die kreisförmige Befestigungskomponente und die kreisförmige Verbindungskomponente fest verbunden sind, wobei die kreisförmige Drehkomponente zwischen der kreisförmigen Befestigungskomponente und der kreisförmigen Verbindungskomponente angeordnet ist, wobei die kreisförmige Drehkomponente eingerichtet ist, um sich um die Achse der verriegelnden Sicherheitsabdeckung zu drehen und entlang der Achse zu verschieben, wobei mindestens ein konkaver und konvexer Blockverriegelungsmechanismus (21, 41) auf den Endflächen der kreisförmigen Drehkomponente und der kreisförmigen Verbindungskomponente derart angeordnet ist, dass ein gemeinsamer Drehzustand und ein unabhängiger Drehzustand zwischen der kreisförmigen Verbindungskomponente und der kreisförmigen Drehkomponente vorliegen.

- 2.** Die verriegelnde Sicherheitsabdeckung nach Anspruch 1, **dadurch gekennzeichnet, dass** der konkave und konvexe Blockverriegelungsmechanismus der kreisförmigen Drehkomponente und der kreisförmigen Verbindungskomponente Folgendes umfasst:

- einen konvexen Block (21), der auf der Endfläche auf einer Seite der Kontaktfläche zwischen der kreisförmigen Drehkomponente und der kreisförmigen Verbindungskomponente angeordnet ist, und
- einen konkaven (41), der auf der Endfläche auf der anderen Seite der Kontaktfläche angeordnet ist, wobei der konkave mindestens einen horizontalen Boden und einen geneigten Boden aufweist.

- 3.** Die verriegelnde Sicherheitsabdeckung nach Anspruch 2, **dadurch gekennzeichnet, dass** der konvexe Block (21) auf der kreisförmigen Drehkomponente angeordnet ist und der konkave (41) auf der kreisförmigen Verbindungskomponente angeordnet ist.

- 4.** Die verriegelnde Sicherheitsabdeckung nach einem der Ansprüche 1 bis 3, wobei:

- ein Befestigungsring (1) der kreisförmigen Befestigungskomponente entspricht,

- eine obere Abdeckung (2) der kreisförmigen Drehkomponente entspricht und
 - ein Gewinding (4) der kreisförmigen Verbindungskomponente entspricht.
5. Die verriegelnde Sicherheitsabdeckung nach Anspruch 4, **dadurch gekennzeichnet, dass** der konvexe Block (21), der zum Verriegeln verwendet wird, auf der unteren Endfläche der oberen Abdeckung angeordnet ist, der konkave (41), der zum Verriegeln verwendet wird, auf der oberen Endfläche des Gewinderings angeordnet ist, wobei der konkave vorzugsweise einen horizontalen Boden und einen geneigten Boden aufweist.
6. Die verriegelnde Sicherheitsabdeckung nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** der Befestigungsring (1) und der Gewinding (4) aneinander durch eine Presspassung von der Innenwand des Gewinderings mit einem Verbindungsspiel befestigt sind, wobei die Kontur des Befestigungsringes (1) T-förmig ist.
7. Die verriegelnde Sicherheitsabdeckung nach Anspruch 6, **dadurch gekennzeichnet, dass** die obere Abdeckung (2) in dem Verbindungsspiel angeordnet ist, das heißt, dass der Innendurchmesser der oberen Abdeckung (2) kleiner ist als der Außendurchmesser des Oberteils des T-förmigen Befestigungsringes (1), und der Oberteil des Befestigungsringes (1) eingerichtet ist, um die obere Abdeckung (2) in dem Verbindungsspiel zwischen dem Befestigungsring (1) und dem Gewinding (4) zu verriegeln.
8. Die verriegelnde Sicherheitsabdeckung nach einem der Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** die untere Endfläche der oberen Abdeckung (2) und die obere Endfläche des Gewinderings (4) eingerichtet sind, um in einem relativen Drehzustand zu sein.
9. Die verriegelnde Sicherheitsabdeckung nach einem der Ansprüche 4 bis 8, **dadurch gekennzeichnet, dass** jeweils vier konkave und konvexe Blockverriegelungsmechanismen, die vier konvexe Blöcke (21) und vier konkave (41) aufweisen, angeordnet sind.
10. Die verriegelnde Sicherheitsabdeckung nach einem der Ansprüche 4-9, **dadurch gekennzeichnet, dass** ein Verbindungsgewinde auf dem unteren Segment des Gewinderings angeordnet ist, um den elektronischen Zigarettenzerstäuber gewindezuverbinden, oder darin, dass die obere Abdeckung (2) einen Aufwärts- und Abwärtsbewegungsraum aufweist, der geringfügig größer ist als die Höhe des konvexen Blocks (21).
11. Ein elektronischer Zigarettenzerstäuber, umfassend einen Zerstäuerkörper (6) und die Sicherheitsabdeckung nach einem der Ansprüche 4-10, wobei die Sicherheitsabdeckung an dem Oberteil des Zerstäuerkörpers (6) angeordnet ist und verwendet wird, um den Oberteil des Zerstäuerkörpers (6) zu verriegeln und abzudichten, und wobei die Sicherheitsabdeckung und der Zerstäuerkörper gewindeverbunden sind.
12. Der elektronischer Zigarettenzerstäuber nach Anspruch 11, wobei ein erster Dichtungsring (3) zwischen dem Äußeren des Befestigungsringes (1) und dem Inneren der oberen Abdeckung (2) angeordnet ist und ein zweiter Dichtungsring (5) auf dem Verbindungsabschnitt des Gewinderings (4) und des Zerstäuerkörpers (6) angeordnet ist, um den Verbindungsabschnitt abzudichten und zu verhindern, dass Zigarettenflüssigkeit austritt.
13. Eine elektronische Zigarette, **dadurch gekennzeichnet, dass** die elektronische Zigarette den elektronischen Zigarettenzerstäuber nach Anspruch 11 oder 12 umfasst.
14. Verfahren zum Verwenden der verriegelnden Sicherheitsabdeckung für einen elektronischen Zigarettenzerstäuber, um zu verhindern, dass ein Gewinde in einer Gewindeverbindungssituation versehentlich abgeschraubt wird, nach einem der Ansprüche 1 bis 10, umfassend die folgenden Schritte:
- Aufschrauben der Abdeckung durch Schrauben nach links der kreisförmigen Drehkomponente, wobei die konvexen Blöcke (21), die in die konkaven (41) einrasten, eine gemeinsame Drehung der kreisförmigen Verbindungskomponente und der kreisförmigen Drehkomponente umsetzen, wobei das Gewinde auf der kreisförmigen Verbindungskomponente aufgeschraubt wird;
 - Abschrauben der Abdeckung durch Schrauben nach rechts der kreisförmigen Drehkomponente, während ein Druck auf die kreisförmige Drehkomponente aufgebracht wird, sodass sich die konvexen Blöcke (21) entlang des geneigten Bodens (44) heben und die kreisförmige Drehkomponente antreiben, sich gemeinsam zu drehen und die Abdeckung abzuschrauben,
- wobei, wenn sich die kreisförmige Drehkomponente natürlich nach rechts geschraubt wird, ohne einen Druck auf die kreisförmige Drehkomponente aufzubringen, der geneigte Boden (44) die konvexen Blöcke (21) entlang des geneigten Bodens (44) hebt, bis die konvexen Blöcke aus den konkaven (41) herausgelangen, sodass die kreisförmige Drehkomponente die kreisförmige Verbindungskomponente

nicht antreibt, sich gemeinsam zu drehen, und die kreisförmige Verbindungskomponente weiterhin eng auf dem Verbindungskörper geschraubt ist.

15. Verfahren zum Verwenden des elektronischen Zigarettenerstäubers nach Anspruch 11 oder 12, umfassend die folgenden Schritte:

- Aufschrauben der verriegelnden Sicherheitsabdeckung durch Schrauben nach links der oberen Abdeckung, wobei der konvexe Block (21) in den konkaven (41) einrastet und nicht daraus herausgelangt und dann den Gewindering (4) antreibt, sich nach links zu drehen, wobei der Gewindering (4) und die Sicherheitsabdeckung aufgeschraubt werden;
- Abschauben der verriegelnden Sicherheitsabdeckung durch Schrauben nach rechts und gleichzeitiges Drücken der oberen Abdeckung (2), wobei der konvexe Block (21) nicht aus dem konkaven (41) gelangt und die obere Abdeckung (2) den Gewindering (4) antreibt, sich zu drehen, wobei dann die Sicherheitsabdeckung abgeschraubt wird,

wobei, wenn die obere Abdeckung (2) natürlich nach rechts geschraubt wird, ohne einen Druck auf die obere Abdeckung aufzubringen, der geneigte Boden (44) in dem konkaven (41) den konvexen Block (21) aus dem konkaven (41) auswirft, um die obere Abdeckung (2) anzuheben, sodass die obere Abdeckung (2) Leerlaufdrehungen relativ zu dem Gewindering (4) durchführt und die Sicherheitsabdeckung nicht geöffnet wird.

Revendications

1. Couvercle de sécurité de verrouillage pour un atomiseur de cigarette électronique pour empêcher le dévissage accidentel d'un filetage dans une situation de raccordement de filetage, **caractérisé en ce que** ledit couvercle comprend :

un composant de fixation circulaire (1),
un composant rotatif circulaire (2), et
un composant de raccordement circulaire (4),
dans lequel ledit composant de fixation circulaire et ledit composant de raccordement circulaire sont raccordés de manière fixe, ledit composant rotatif circulaire est placé entre le composant de fixation circulaire et le composant de raccordement circulaire,
dans lequel ledit composant rotatif circulaire est configuré pour tourner autour de l'axe du couvercle de sécurité de verrouillage et coulisser le long dudit axe, au moins un mécanisme de verrouillage de blocs concave et convexe (21, 41)

est placé sur les faces d'extrémité du composant rotatif circulaire et du composant de raccordement circulaire de sorte qu'un état de rotation joint et un état de rotation indépendant existent entre le composant de raccordement circulaire et le composant rotatif circulaire.

2. Couvercle de sécurité de verrouillage selon la revendication 1, **caractérisé en ce que** le mécanisme de verrouillage de blocs concave et convexe du composant rotatif circulaire et du composant de raccordement circulaire comprend :

un bloc convexe (21) placé sur la face d'extrémité d'un côté de la surface de contact entre ledit composant rotatif circulaire et ledit composant de raccordement circulaire, et
un concave (41) placé sur la face d'extrémité de l'autre côté de la surface de contact, dans lequel ledit concave a au moins un fond horizontal et un fond incliné.

3. Couvercle de sécurité de verrouillage selon la revendication 2, **caractérisé en ce que** ledit bloc convexe (21) est placé sur le composant rotatif circulaire, et ledit concave (41) est placé sur le composant de raccordement circulaire.

4. Couvercle de sécurité de verrouillage selon l'une quelconque des revendications 1 à 3, dans lequel :

une bague de fixation (1) correspondant au composant de fixation circulaire,
un couvercle supérieur (2) correspondant au composant rotatif circulaire, et
une bague filetée (4) correspondant au composant de raccordement circulaire.

5. Couvercle de sécurité de verrouillage selon la revendication 4, **caractérisé en ce que** ledit bloc convexe (21) utilisé pour le verrouillage est placé sur la face d'extrémité inférieure dudit couvercle supérieur, le concave (41) utilisé pour le verrouillage est placé sur la face d'extrémité supérieure de ladite bague filetée, ledit concave a de préférence un fond horizontal et un fond incliné.

6. Couvercle de sécurité de verrouillage selon la revendication 4 ou 5, **caractérisé en ce que** la bague de fixation (1) et la bague filetée (4) sont fixées ensemble par le biais d'un ajustement par serrage à partir de la paroi intérieure de la bague filetée avec un jeu de raccordement, le contour de la bague de fixation (1) est en forme de T.

7. Couvercle de sécurité de verrouillage selon la revendication 6, **caractérisé en ce que** le couvercle supérieur (2) est placé dans le jeu de raccordement,

c'est-à-dire que le diamètre intérieur du couvercle supérieur (2) est inférieur au diamètre extérieur du sommet de la bague de fixation en forme de T (1), et le sommet de la bague de fixation (1) est configuré pour verrouiller le couvercle supérieur (2) dans le jeu de raccordement entre la bague de fixation (1) et la bague filetée (4).

8. Couvercle de sécurité de verrouillage selon l'une quelconque des revendications 4 à 7, **caractérisé en ce que** la face d'extrémité inférieure dudit couvercle supérieur (2) et la face d'extrémité supérieure de ladite bague filetée (4) sont configurées pour être dans un état de rotation relative. 10
9. Couvercle de sécurité de verrouillage selon l'une quelconque des revendications 4 à 8, **caractérisé en ce que** l'on place respectivement quatre mécanismes de verrouillage de blocs concave et convexe comprenant quatre blocs convexes (21) et quatre concaves (41). 15
10. Couvercle de sécurité de verrouillage selon l'une quelconque des revendications 4 à 9, **caractérisé en ce qu'un** filetage de raccordement est placé sur le segment inférieur de ladite bague filetée pour raccorder par filetage l'atomiseur de cigarette électronique, ou **en ce que** le couvercle supérieur (2) a un espace de déplacement ascendant et descendant légèrement supérieur à la hauteur du bloc convexe (21). 20
11. Atomiseur de cigarette électronique comprenant un corps d'atomiseur (6) et le couvercle de sécurité selon l'une quelconque des revendications 4 à 10, dans lequel le couvercle de sécurité est placé au sommet du corps d'atomiseur (6) et est utilisé pour verrouiller et sceller le sommet du corps d'atomiseur (6), et dans lequel le couvercle de sécurité et le corps d'atomiseur sont raccordés par filetage. 25
12. Atomiseur de cigarette électronique selon la revendication 11, dans lequel une première bague d'étanchéité (3) est placée entre l'extérieur de la bague de fixation (1) et l'intérieur du couvercle supérieur (2), et une seconde bague d'étanchéité (5) est placée sur la partie de raccordement de la bague filetée (4) et le corps d'atomiseur (6) afin de sceller la partie de raccordement et éviter la fuite du liquide pour cigarette. 30
13. Cigarette électronique **caractérisé en ce que** ladite cigarette électronique comprend l'atomiseur de cigarette électronique selon la revendication 11 ou 12. 35
14. Procédé pour utiliser le couvercle de sécurité de verrouillage pour un atomiseur de cigarette électronique afin d'empêcher le dévissage accidentel d'un fileta- 40

ge dans une situation de raccordement par filetage selon l'une quelconque des revendications 1 à 10, comprenant les étapes suivantes :

visser le couvercle en vissant vers la gauche le composant rotatif circulaire, les blocs convexes (21) encliquetés dans les concaves (41) réalisent une rotation jointe du composant de raccordement circulaire et du composant rotatif circulaire, le filetage sur le composant de raccordement circulaire est vissé ;
 dévisser le couvercle en faisant pivoter vers la droite le composant rotatif circulaire tout en appliquant une pression sur le composant rotatif circulaire, de sorte que les blocs convexes (21) montent le long du fond incliné (44) et entraînent le composant rotatif circulaire à tourner conjointement et dévisser le couvercle,
 dans lequel, lorsque le composant rotatif circulaire est naturellement pivoté vers la droite sans appliquer de pression sur le composant rotatif circulaire, le fond incliné (44) fait monter les blocs convexes (21) le long du fond incliné (44) jusqu'à ce que les blocs convexes sortent des concaves (41), de sorte que le composant rotatif circulaire n'entraîne pas le composant de raccordement circulaire à tourner conjointement, et le composant de raccordement circulaire est toujours vissé avec serrage sur le corps de raccordement.

15. Procédé pour utiliser l'atomiseur de cigarette électronique selon la revendication 11 ou 12, comprenant les étapes suivantes :

visser le couvercle de sécurité de verrouillage en faisant pivoter vers la gauche le couvercle supérieur, le bloc convexe (21) est encliqueté dans le concave (41) et ne sort pas de ce dernier, et entraîne la bague filetée (4) pour faire tourner vers la gauche la bague filetée (4) et le couvercle de sécurité est vissé ;
 dévisser le couvercle de sécurité de verrouillage en pivotant vers la droite et en comprimant simultanément le couvercle supérieur (2), le bloc convexe (21) ne sort pas du concave (41), et le couvercle supérieur (2) entraîne la bague filetée (4) à tourner, alors le couvercle de sécurité est dévissé,
 dans lequel lorsque le couvercle supérieur (2) est naturellement pivoté vers la droite sans appliquer de pression sur le couvercle supérieur, le fond incliné (44) dans le concave (41) éjecte le bloc convexe (21) hors du concave (41) pour lever le couvercle supérieur (2), de sorte que le couvercle supérieur (2) fait des rotations au ralenti par rapport à la bague filetée (4) et le couvercle de sécurité n'est pas ouvert.

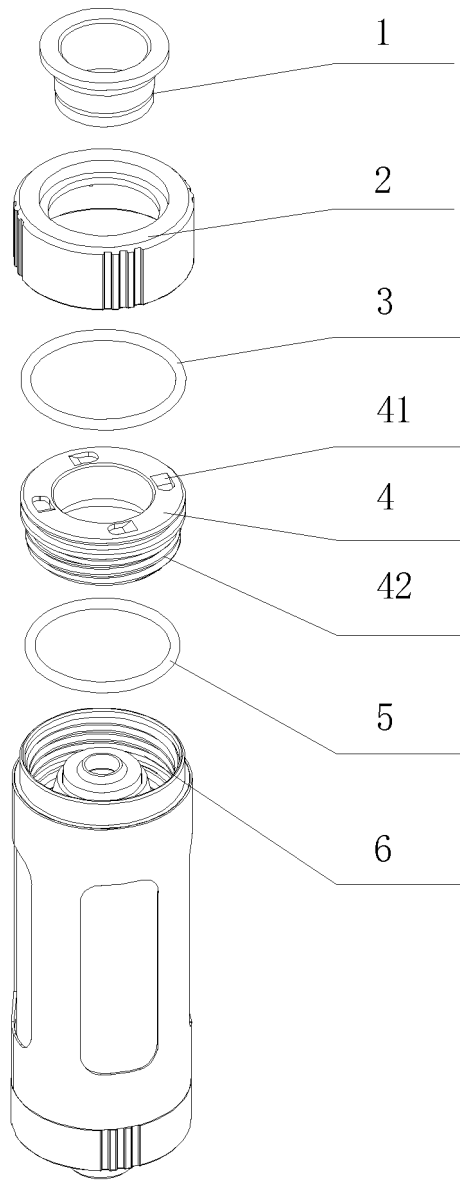


FIG. 1

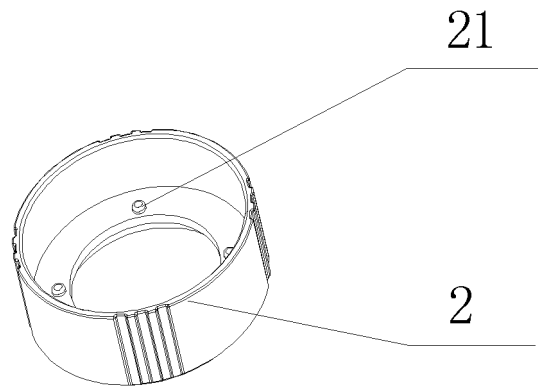


FIG. 2

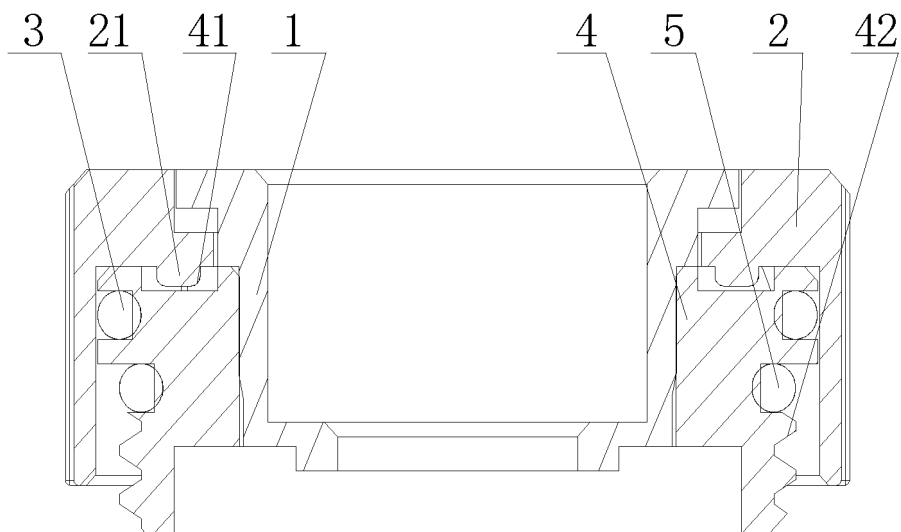


FIG. 3

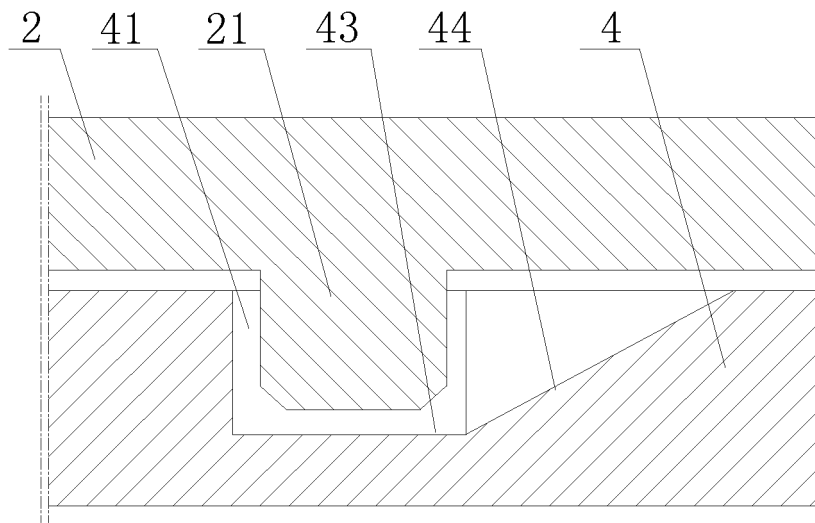


FIG. 4

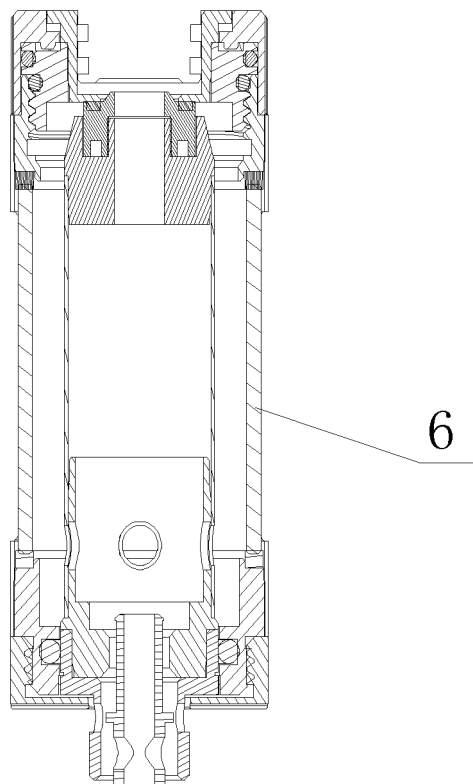


FIG. 5

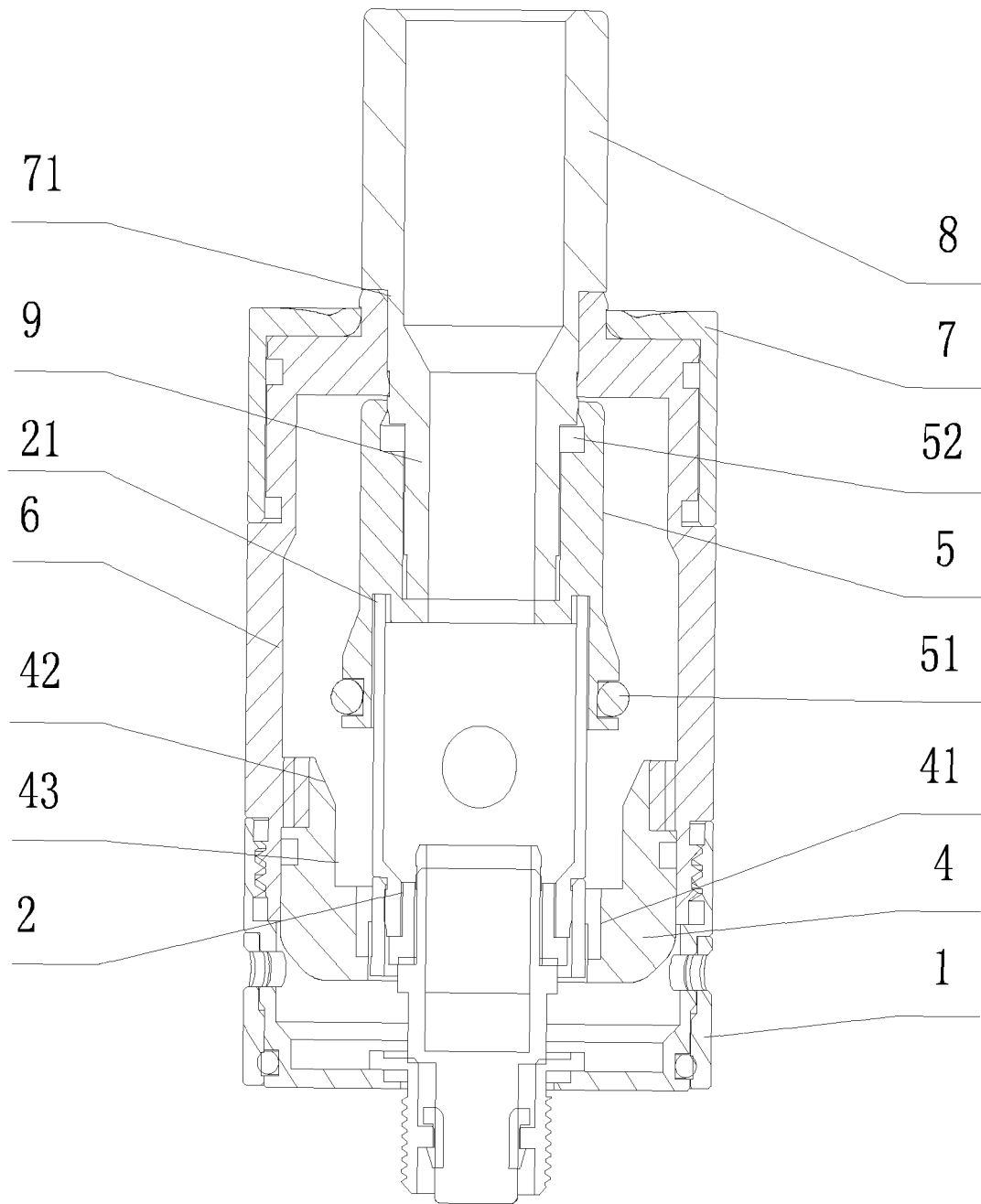


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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