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(54) TOP MOUNT BUTTON MECHANISM

(57) The invention discloses a top mount button mechanism, and relates to the field of smart top mounts for toilets. The top mount button mechanism includes a button body, a first elastic piece, a second elastic piece, a connecting rod and a switch contact, the connecting rod is connected with the switch contact, the button body is connected with the connecting rod, the first elastic

piece and the second elastic piece are respectively located on the two sides of the connecting rod, and the first elastic piece and the second elastic piece support the two ends of the button body. The invention has the technical effects that a button feels good and is not prone to being jammed in use.

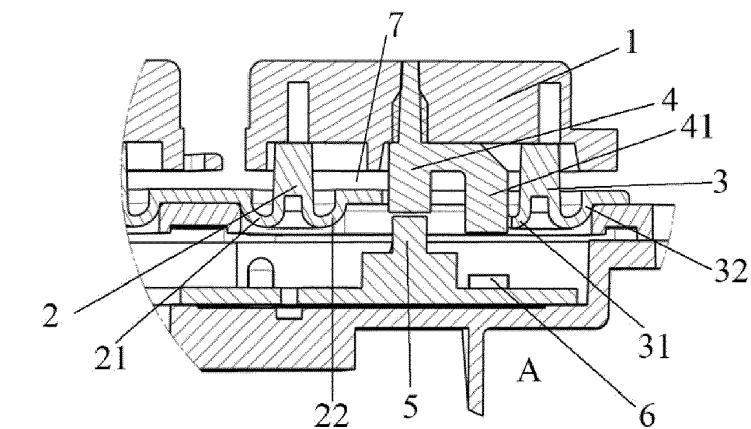


Fig. 3

Description**Field of the Invention**

[0001] The invention relates to the field of smart top mounts for toilets, in particular to a top mount button mechanism.

Background of the Invention

[0002] With the improvement of people's living standards and hygiene awareness, the popularizing rate of smart toilets is getting higher and higher. Many families have already chosen smart toilets when renovating, and moreover, some families have replaced ordinary toilet covers with smart toilet top mounts. In addition, some hotels and guest houses are also equipped with the smart toilets, making the application of the smart toilets wider.

[0003] With the increase of user demands, a variety of functions have been simultaneously integrated into a single smart top mount for a toilet, such as heating, warm water cleaning, warm air drying, deodorization and sterilization, and other functions. Under normal circumstances, the smart top mount generally includes various buttons to realize its basic functions. However, existing buttons have no balance structure and are prone to tilting in the process of being pressed down or resetting, which will lead to jamming, and especially for the buttons with large lengths, their jamming phenomena are more serious.

Summary of the Invention

[0004] In view of the above defects of the prior art, the technical problem to be solved by the invention is to help a button reset to relieve a jamming phenomenon mentioned in the background of the invention.

[0005] In order to realize the above purpose, the invention provides a button mechanism for a top mount, including a button body, a first elastic piece, a second elastic piece, a connecting rod and a switch contact, the connecting rod is connected with the switch contact, the button body is connected with the connecting rod, the first elastic piece and the second elastic piece are respectively located on two sides of the connecting rod, and the first elastic piece and the second elastic piece support two ends of the button body.

[0006] Further, the first elastic piece is provided with a first extension part and a second extension part, and the first extension part and the second extension part extend towards a position below a button base plate and then overturn to be lapped on the button base plate on one side of the first elastic piece; and the second elastic piece is provided with a third extension part and a fourth extension part, the third extension part and the fourth extension part extend towards a position below the button base plate and then overturn to be lapped on the button base plate on one side of the second elastic piece.

[0007] Further, the first elastic piece and the second elastic piece are made of silica gel.

[0008] Further, the top mount button mechanism further includes a light-guiding column and a light-emitting element, the connecting rod is hollow and is connected with the light-guiding column, and the light-guiding column is opposite to the light-emitting element.

[0009] Further, the light-guiding column and the connecting rod are transparent materials.

[0010] Further, the light-emitting element is an LED light.

[0011] Further, through holes are formed in the button body, and the connecting rod is inserted into the corresponding through hole.

[0012] Further, inner walls of the through holes have inclination angles, and diameters of the through holes are gradually enlarged in a direction of the switch contact.

[0013] Further, there are a plurality of top mount button mechanisms.

[0014] The invention has the technical effect that the button feels good and is not prone to being jammed in use.

[0015] The conception, specific structure and produced technical effects of the invention will be further explained below in combination with the drawings to fully understand the purposes, features and effects of the invention.

Brief Description of the Drawings

[0016] By reading the detailed description of the non-restrictive embodiment with reference to the drawings below, other features, purposes and advantages of the invention will be more apparent:

[0017] Fig. 1 shows a structural diagram of an embodiment of the invention;

[0018] Fig. 2 shows a structural sectional view of the embodiment of the invention; and

[0019] Fig. 3 shows a sectional enlarged drawing of part A of the embodiment of the invention.

[0020] The description on signs of the drawings: 1-button body; 2-first elastic piece; 21-first extension part; 22-second extension part; 3-second elastic piece; 31-third extension part; 32-fourth extension part; 4-connecting rod; 41-light-guiding column; 5-switch contact; 6-light-emitting element; 7-button base plate.

Detailed Description of the Embodiment

[0021] A preferred embodiment of the invention is introduced below with reference to the drawings of the description to make its technical contents clearer and convenient to understand.

[0022] As shown in Fig. 1 to Fig. 3, the invention dis-

closes a top mount button mechanism, including a button body 1, a first elastic piece 2, a second elastic piece 3, a connecting rod 4 and a switch contact 5, the connecting rod 4 is connected with the switch contact 5, the button body 1 is connected with the connecting rod 4, the first elastic piece 2 and the second elastic piece 3 are respectively located on two sides of the connecting rod 4, and the first elastic piece 2 and the second elastic piece 3 support two ends of the button body 1. When the button body 1 is pressed in the middle, the first elastic piece 2 and the second elastic piece 3 are simultaneously pressed down and reset when the button body 1 is released. When the two ends of the button body 1 are pressed, the button body 1 has sufficient force to reset due to the fact that both ends have the elastic pieces for supporting.

[0020] Further, the first elastic piece 2 is further provided with a first extension part 21 and a second extension part 22, and the first extension part 21 and the second extension part 22 extend towards a position below a button base plate 7 and then overturn to be lapped on the button base plate 7 on one side of the first elastic piece 2; and the second elastic piece 3 is provided with a third extension part 31 and a fourth extension part 32, the third extension part 31 and the fourth extension part 32 extend towards a position below the button base plate 7 and then overturn to be lapped on the button base plate 7 on one side of the second elastic piece 3. The button base plate 7 is usually a plate with a plurality of through holes, which is used for making the switch contact 5, the connecting rod 4 and the like penetrate through the corresponding through holes. The first elastic piece 2 mutually forms a 'U'-like structure on a longitudinal section with each of the first extension part 21 and the second extension part 22, which surrounds a body of the first elastic piece 2, and thus a larger resilience force can be given to the button body 1. In addition, the first extension part 21 and the second extension part 22 can be lapped on the button base plate 7 after being bent, and thus the through holes of the button base plate 7 can be sealed to prevent short circuit of a circuit board caused by entering of water vapor or liquid. The second elastic piece 3 and the first elastic piece 2 are the same in structure, which is not described in detail herein.

[0021] Further, the first elastic piece and the second elastic piece are made of silica gel.

[0022] Further, the top mount button mechanism further includes: a light-guiding column 41 and a light-emitting element 6, the connecting rod 4 is hollow and is connected with the light-guiding column 41, and the light-guiding column 41 is opposite to the light-emitting element 6. The light-guiding column 41 is also of a hollow structure, which is used for making light emitted by the light-emitting element 6 pass through, light rays shine on the button body 1 along the hollow connecting rod 4, and thus in the case that there are a plurality of buttons, a user is assisted to distinguish the function of each button.

[0023] Further, the light-guiding column 41 and the

connecting rod 4 are transparent materials to improve the conduction efficiency of the light rays.

[0024] Further, the light-emitting element 6 is an LED light and can also be a breathing light and the like, which is not limited herein.

[0025] Further, through holes are formed in the button body 1, and the connecting rod 4 is inserted into the corresponding through hole.

[0026] Further, inner walls of the through holes have 10 inclination angles, and diameters of the through holes are gradually enlarged in a direction of the switch contact 5, so that a sufficient space is reserved, and when the two ends of the button body 1 are pressed, the connecting rod 4 can touch the switch contact 5 without causing the 15 connecting rod 4 to be broken at the same time.

Claims

- 20 1. A button mechanism for a top mount, **characterized in** comprising a button body, a first elastic piece, a second elastic piece, a connecting rod and a switch contact, the connecting rod is connected with the switch contact, the button body is connected with the connecting rod, the first elastic piece and the second elastic piece are respectively located on two sides of the connecting rod, and the first elastic piece and the second elastic piece support two ends of the button body.
- 25 2. The button mechanism according to claim 1, **characterized in that** the first elastic piece is provided with a first extension part and a second extension part, and the first extension part and the second extension part extend towards a position below a button base plate and then overturn to be lapped on the button base plate on one side of the first elastic piece; and the second elastic piece is provided with a third extension part and a fourth extension part, the third extension part and the fourth extension part extend towards a position below the button base plate and then overturn to be lapped on the button base plate on one side of the second elastic piece.
- 30 3. The button mechanism according to claim 1 or 2, **characterized in that** the first elastic piece and the second elastic piece are silica gel.
- 35 4. The button mechanism according to one of the preceding claims, **characterized in that** the top mount button mechanism further comprises a light-guiding column and a light-emitting element, the connecting rod is hollow and is connected with the light-guiding column, and the light-guiding column is opposite to the light-emitting element.
- 40 5. The button mechanism according to claim 4, **characterized in that** the light-emitting column and the

connecting rod are transparent materials.

6. The button mechanism according to claim 4 or 5, **characterized in that** the light-emitting element is an LED light. 5
7. The button mechanism according to one of the preceding claims, **characterized in that** through holes are formed in the button body, and the connecting rod is inserted into the corresponding through hole. 10
8. The button mechanism according to claim 7, **characterized in that** inner walls of the through holes have inclination angles, and diameters of the through holes are gradually enlarged in a direction of the switch contact. 15
9. The button mechanism according to any one of claims 1 to 8, **characterized in that** there are a plurality of top mount button mechanisms. 20
10. A toilet top mount including a button mechanism according to one of claims 1 to 8 or a plurality thereof according to claim 9. 25

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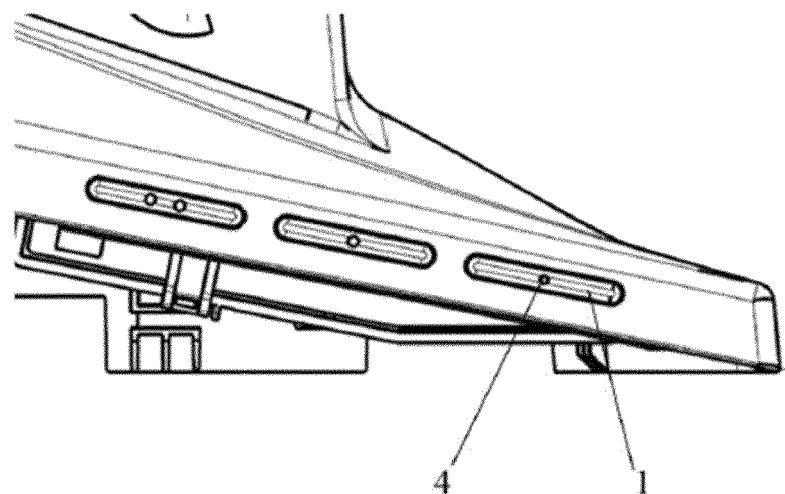
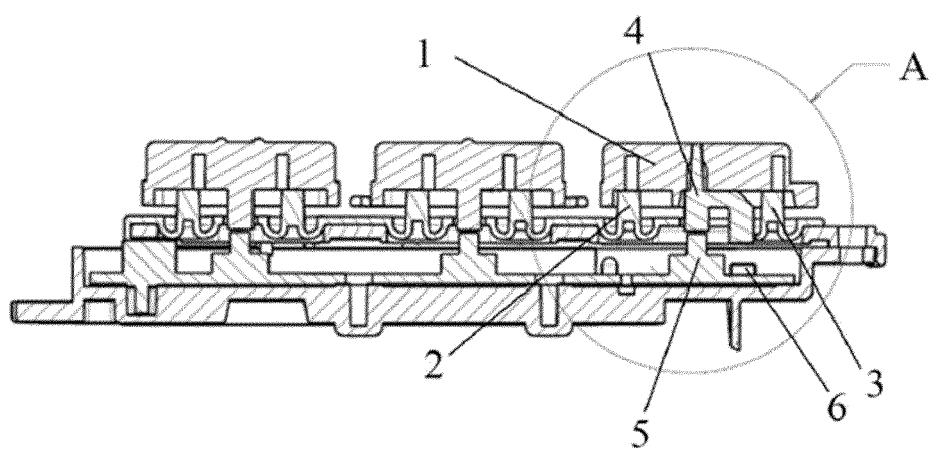


Fig. 1



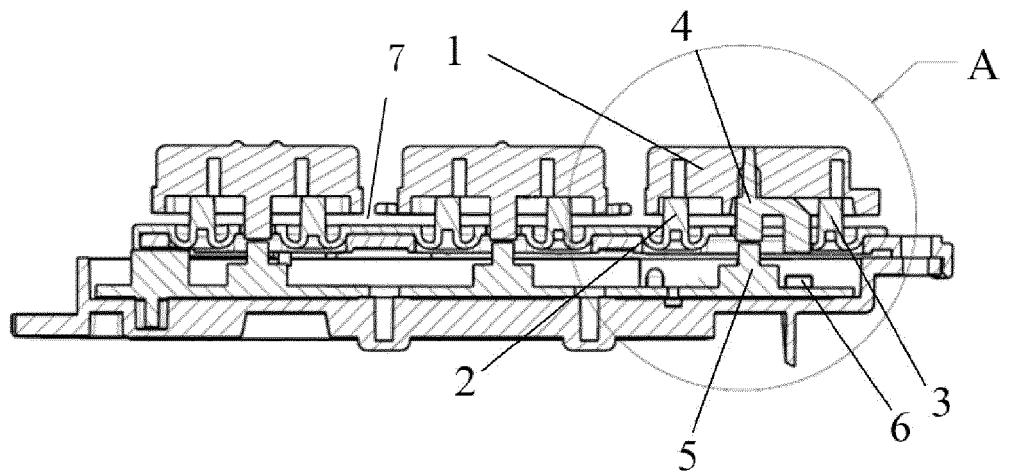


Fig. 2

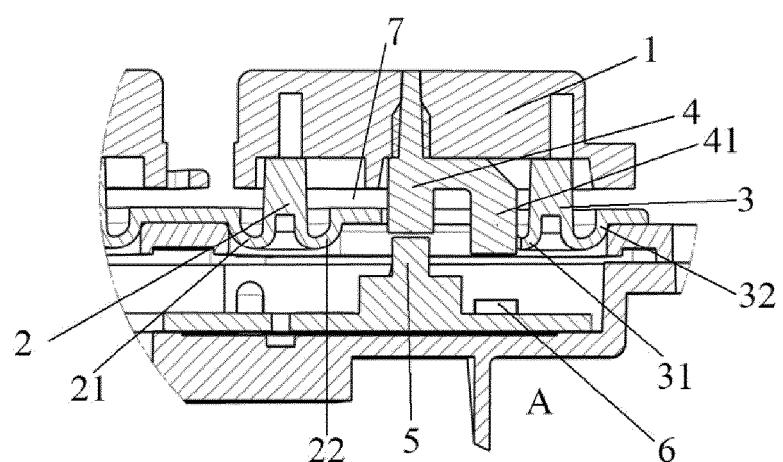
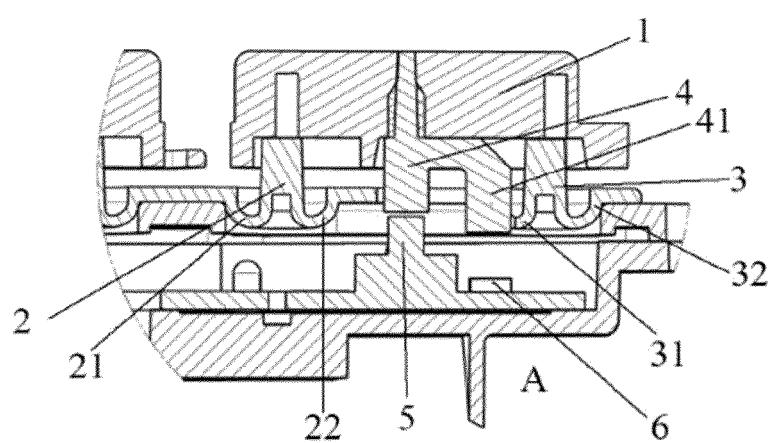


Fig. 3



EUROPEAN SEARCH REPORT

Application Number

EP 21 20 4770

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
10	X US 2012/298492 A1 (WESTPHAL MICHAEL [DE] ET AL) 29 November 2012 (2012-11-29) * figures 5, 6 *	1-10	INV. A47K13/24 G05G1/02 H01H13/02
15	A US 8 637 781 B2 (DERENGOWSKI THOMAS D [US]; DELIANIDES JOHN [US] ET AL.) 28 January 2014 (2014-01-28) * figure 4 *	3	
20	A US 4 491 991 A (HERBRUCK STEVEN L [US]) 8 January 1985 (1985-01-08) * figure 2 *	10	
25			
30			TECHNICAL FIELDS SEARCHED (IPC)
35			A47K G05G H01H F21V G06F
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50	3 The present search report has been drawn up for all claims		
55	Place of search The Hague	Date of completion of the search 25 February 2022	Examiner Boyer, Olivier
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25-02-2022

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
15	US 2012298492 A1	29-11-2012	CN 102804308 A DE 102009051617 B3 EP 2497097 A1 ES 2527631 T3 PL 2497097 T3 RU 2012122778 A US 2012298492 A1 WO 2011051474 A1	28-11-2012 28-04-2011 12-09-2012 27-01-2015 29-05-2015 10-12-2013 29-11-2012 05-05-2011
20	US 8637781 B2	28-01-2014	NONE	
25	US 4491991 A	08-01-1985	NONE	
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