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(54) **Toothpaste tube squeezer**

(57) The present invention refers to a toothpaste tube squeezer, comprising a container with a top central rectilinear slot and internal means to support a close pair of rolls with horizontal axis under the slot in horizontal position, capable of rotating together in the same direc-

tion and being controlled manually or automatically with suitable driving means actuated externally on the container; it being provided that the top slot and the distance between the rolls allow for housing the bottom section of a toothpaste tube.

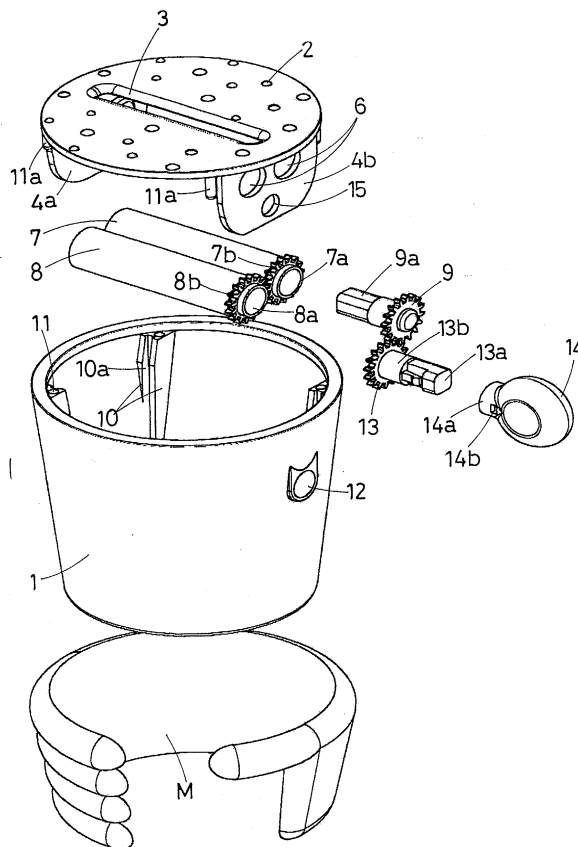


FIG. 1

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Description

[0001] The present patent application refers to a toothpaste tube squeezer.

[0002] The invention has been devised to innovate the current technology, which makes use of rather obsolete, totally standardised solutions.

[0003] In particular, the only toothpaste tube squeezer that has enjoyed some diffusion on the market has been the typical key with a narrow elongated eye, in which the bottom of the toothpaste tube is inserted.

[0004] As it is known, the key is used to roll the end of the toothpaste tube gradually, in order to empty the tube in a rational, complete way.

[0005] The purpose of the present invention is to obtain a tool capable of squeezing toothpaste tubes according to alternative operation modes, characterised by higher convenience and efficiency compared to traditional keys; all of the above with a product characterised by an attractive innovative design that may become very popular with young users.

[0006] Another purpose of the present invention is to provide the tool of the invention with a simple structure composed of a few modular parts, preferably plastic moulded parts, which can be assembled easily and rapidly without using external fixing means.

[0007] Obviously, this makes the tool extremely inexpensive and especially indicated to be produced in a series with industrial production means.

[0008] In practical terms, the tool of the invention is composed of a container with any type of configuration, provided with an internal pair of contra-rotating rolls at a certain distance from the bottom, which can be actuated by means of a small handle that protrudes laterally from the container.

[0009] The top of the container has a narrow rectilinear slot into which the bottom section of the toothpaste tube is inserted, so that it is exactly housed in the narrow space between the two contra-rotating rolls that rotate in the same direction.

[0010] The space between the two rolls must allow the rolls to exercise energetic friction against the tube during rotation.

[0011] Evidently, the rotations imposed on the rolls by means of the external handle gradually drag the tube towards the bottom of the container and cause the discharge of regular amounts of toothpaste through the opening of the tube, which remains outside of the container.

[0012] The distance between the pair of "squeezing" rolls and the bottom of the container must be such that the entire length of the toothpaste tube can be housed under the rolls.

[0013] This allows for the complete squeezing of the toothpaste tube contained in the container.

[0014] For major clarity the description of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration only and

not in a limiting sense, whereby:

- Figure 1 is an exploded axonometric view of the tool of the invention;
- Figure 2 is an axonometric view of the lower side of the lid used in the tool of Fig. 1;
- Figure 3 is an exploded axonometric view of an alternative constructive embodiment of the tool of the invention;
- Figure 4 is an axonometric view of the tool of Fig. 3 during an intermediate assembly stage;
- Figure 5 is an axonometric view of the tool of Fig. 3 after complete assembly;
- Figure 6 is an exploded axonometric view of a motorised version of the tool of the invention.

[0015] With reference to the embodiment shown in Figs. 1 and 2, the tool of the invention is completely made of plastic moulded parts and composed of a basically truncated conical vase (1) with circular lid (2), provided with a rectilinear slot (3) in which the bottom section of a toothpaste tube is inserted.

[0016] The lower side of the lid (2) is provided with two rectilinear opposite borders in edgeways position (4a, 4b), slightly under the perimeter edge of the lid (2).

[0017] The first border (4a) is internally provided with two circular projections (5) in adjacent position, which exactly correspond with two circular holes (6) on the second border (4b), for the installation of two identical contra-rotating rolls (7, 8) between the two opposite borders (4a, 4b).

[0018] In particular, the hollow rear end of each roll (7, 8) is matched with one of the circular projections (5) of the first border (4a), and the front end (7a, 8a) is housed into the corresponding hole (6) on the second border (4b).

[0019] As shown in the aforementioned figures, the two rolls (7, 8) are placed at a short distance one from the other (thus allowing for the insertion of the bottom section of the toothpaste tube). The rolls (7, 8) can rotate in the same direction by means of two crown-wheels (7b, 8b) located immediately behind the front ends (7a, 8a) of the rolls (7, 8) internally to the second border (4b).

[0020] Once the two rolls (7, 8) have been installed under the lid (2), another assembly operation must be performed.

[0021] In fact, a pin (9a) with a crown-wheel (9) must be exactly engaged into the front end (7a) of the first roll (7).

[0022] The pin (9a) has a square cross-section and can be couple with the internal suitably shaped profile of the roll (7) in a prismatic way; this makes the pin (9a) integral with the roll (7).

[0023] The pin (9a) is inserted into the end (7a) of the first roll (7) through the same hole (6) of the second border (4b) designed to support the end (7a); this makes it possible for the crown-wheel (9) of the pin (9a) to be located in external position on the border (4b).

[0024] In order to ensure the exact stable coupling between the lid (2) and the vase (1), the vase (1) is internally provided with four pairs of vertical ribs (10), two by two in opposite position, which create the four corners of a virtual square inscribed in the circular opening of the vase (1).

[0025] Practically, each pair of ribs (10) defines an intermediate rectilinear groove (10a); it being provided that each groove (10a), together with the groove in opposite position, defines a sort of "pocket" where the two vertical edges of one of the borders (4a, 4b) under the lid (2) can be exactly inserted.

[0026] To make the coupling between the lid (2) and the vase (1) stable, a circular hole (11) is provided behind the opening section of each groove (10a) to access a narrow cylindrical housing with vertical direction.

[0027] The four holes (11) are used to engage corresponding pegs (11a) that protrude from the lower side of the lid (2) into corresponding cylindrical housings at the sides of the borders (4a, 4b).

[0028] The vase (1) has a lateral circular hole (12) in which a pin (13a) with a corresponding crown-wheel (13) is inserted from inside outwards; in particular, the crown-wheel (13) is obtained on a section (13b) of the pin with circular cross-section, followed by a section with basically square cross-section.

[0029] The section with circular cross-section (13b) engages, with the possibility of free rotation, inside the lateral hole (12) of the vase (1); the crown-wheel (13) remains inside the vase (1), while the section with square cross-section (13a) remains outside the vase (1), so as to engage and couple with a corresponding sleeve (14a) of an actuation handle (14) in a prismatic way.

[0030] In particular, the position of the crown-wheel (13) inside the vase (1) must be such as to allow the crown-wheel (13) to engage the crown-wheel (9) located in external position on the second border (4b) of the lid (2) when the lid (2) is placed onto the vase (1).

[0031] To make the pin (13a) more stable, the pin (13a) is provided with a tapered end (not shown in the enclosed drawings) below the crown-wheel (13), which is inserted and supported inside a suitable hole (15) on the second border (14b) of the lid (2) under the aforementioned pair of holes (6).

[0032] The actuation of the handle (14) drags the crown-wheel (13) inside the vase (1) into rotation, and in turn the crown-wheel (13) drags the crown-wheel (9) associated with the lid (2) into rotation, the crown-wheel (9) drags the first roll (7) to which it is joined by means of the pin (9a) into rotation and finally the first roll (7) drags the second roll (8) into inverse rotation by means of the connection between the corresponding crown-wheels (7b, 8b).

[0033] As shown in Fig. 1, the square section of the pin (13a) has a longitudinal hook that snaps into a hole (14) located on the side of the sleeve (14a) of the handle (14), when the connection between the pin (13a) and

the sleeve (14a) has been completed.

[0034] This prevents the accidental release of the two parts, although it appears evident that the user can pull the handle (14) backwards to overcome the resistance of the hook (13c) to release the two parts.

[0035] As shown in Fig. 1, the pin (13) and the pin (9) have exactly the same structure.

[0036] These are two pieces of the same part; of course, this is particularly convenient to reduce the number of parts needed to produce the tool of the invention, and consequently production costs.

[0037] Finally, it must be noted that Figure 1 also shows an accessory of the tool of the invention: a wall shelf (M) provided with basically truncated-conical bracket used to insert and support the vase (1), if necessary.

[0038] Although Figure 1 shows a vase (1) with truncated-conical shape, the same vase (1) can have a cylindrical or square structure, it only being necessary in this case to modify the shape of the lid.

[0039] Figures 3 to 5 refer to another embodiment of the invention that makes use of the same inventive principle as the previous embodiment, although with a different constructive shape.

[0040] In the latter case, the bearing structure of the tool of the invention is composed of a hollow body (100) with two identical half-shells (100a, 100b) snapped together; once assembly has been completed, the embodiment features the top slot (30) used to insert the bottom section of a toothpaste tube.

[0041] Specifically, the hollow body used for this embodiment of the invention has the shape of a stylised fish to create a pleasant shape for children.

[0042] The first half-shell (100a) incorporates two opposite borders in edgeways position (40a, 40b); the first border (40a) is internally provided with two circular projections (50), which exactly correspond with two circular holes (60) on the second border (40b), with a smaller central hole (150) under the holes (60).

[0043] The close pair of contra-rotating rolls (70, 80) is mounted between the borders (40a, 40b).

[0044] Also in this case, the rear end of the two rolls (70, 80) is coupled with the circular projections (50), and the front end is inserted and supported into the corresponding holes (60) of the second border (40b); also in this case the two rolls (70, 80) are mutually engaged by means of corresponding crown-wheels (70b, 70a) in internal position on the second border (40b).

[0045] The front end (70a) of the first roll (70) is designed to be coupled in a prismatic way with a pin with square cross-section (90a), with a crown-wheel (90) designed to engage with the crown-wheel coupled at the end of a pin (130a).

[0046] In particular, the front tapered end (130d) of the pin (130a) is inserted and supported, with the possibility of free rotation, inside the hole (150) in the centre on the second border (40b), and the rear end with square cross-section externally projects from the hollow struc-

ture of the tool of the invention to be coupled with the sleeve (140a) of an actuation handle (140) in a prismatic way.

[0047] The section with circular cross-section (130b) of the pin (130a) is inserted and supported, with the possibility of free rotation, inside the circular hole (120), which is located half on the right half-shell (100a) and half on the left half-shell (100b) of the bearing structure of the tool of the invention.

[0048] As shown in Fig. 4, once the different parts have been assembled, the two half-shells (100a, 100b) are coupled to obtain the tool of the invention, as shown in Fig. 5.

[0049] With reference to Figure 6, a motorised version of the tool of the invention is also possible.

[0050] With this view, an engine with vertical axis (20) powered with a mini-battery (21) is housed in the main container, whose shaft (22) protrudes upwards and drags the roll (7) engaged with the adjacent roll (8) into rotation by means of a traditional conical torque.

[0051] The engine (20) is actuated by means of a button/switch (24) that protrudes in lateral position from the container (1) through the hole (12).

[0052] Although Fig. 6 refers to the motorised version of the tool of Fig. 1, a motorised version can also be realised for the tool shown in Fig. 3 according to the same constructive and operational modes.

Claims

1. Toothpaste tube squeezer, **characterised by** the fact that it comprises a container (1/100) with a top central rectilinear slot (3/30) and internal means to support a close pair of rolls with horizontal axis (7/70, 8/80) under the slot (3/30) in horizontal position, capable of rotating together in the same direction and being controlled manually or automatically with suitable driving means actuated externally on the container (1/100); it being provided that the top slot (3/30) and the distance between the rolls (7/70, 8/80) allow for housing the bottom section of a toothpaste tube.
2. Tool as defined in claim 1, **characterised by** the fact that the means used to support the close pair of contra-rotating rolls (7/70, 8/80) in horizontal position are composed of two opposite borders in edgeways position (4a/40a, 4b/40b), with the first border (4a/40a) internally provided with two circular projections (5/50) in adjacent position, which exactly correspond with two circular holes (6/60) on the second border (4b/40b) so that the rear hollow end of each roll can be coupled with one of the circular projections (5/50) of the first border (4a/40a) and the front end (7a/70a) can engage into the corresponding hole (6/60) of the second border (4b/40b); it being provided that the means that allow the rolls (7/70,

8/80) to rotate in the same direction are represented by two crown-wheels (7b/70b, 8b/80b) mutually engages, located immediately behind the front ends (7a/70a, 8a/80a) of the rolls in internal position on the second border (4b/40b); it being provided that the means that allow the rolls (7/70, 8/80) to be dragged into rotation are represented by two identical pins (9a/90a, 13a/130a) engaged by means of the corresponding crown-wheels (9/90, 13/130), of which the first pin (9a/90a) is inserted and blocked into the front end (7a/70a) of the first roll (7/70) through the same hole (6/60) of the second border (4b/40b) designed to support the front end, and the second pin (13a/130a) is inserted into a hole (12/120) located on the side of the bearing container (1/100) so that its end can protrude externally and couple with the sleeve (14a/140a) of an actuation handle (14/140); it being provided that the front tapered end of the second pin (13a/130a) is inserted and supported into a suitable hole (15/150) located on the second border (4b/40b) under the two holes (6/60).

3. Tool as defined in one or both the preceding claims, **characterised, in** a preferred embodiment, by the fact that it is provided with an engine with vertical axis (20) powered with a mini-battery (21) housed in the container (1/100), whose shaft (22) protrudes upwards and drags one of the contra-rotating rolls (7/70, 8/80) into rotation by means of a traditional conical torque (23); it being provided that the engine (20) is actuated by means of a button/switch (24) that protrudes in lateral position from the container (1) through the hole (12/120).
4. Tool as defined in one or more of the preceding claims, **characterised by** the fact that the bearing container (1) is composed of a vase closed on top by a lid (2) which has the central slot (3) and supports the two opposite vertical borders (4a, 4b) on the lower side; it being provided that, when the vase (1) is closed with the lid (2), each border (4a, 4b) is engaged in a "pocket" located in internal position in the vase by means of two opposite pairs of ribs (20), with each rib (20) defining an intermediate rectilinear groove (10a) suited to exactly house one of the rectilinear vertical edges of one of the borders (4a, 4b).
5. Tool as defined in one or more of the first three claims, **characterised by** the fact that the bearing container (100) is composed of two half-shells (100a, 100b), with the first half-shell (100a) incorporating the two opposite borders in edgeways position (40a, 40b); it being provided that each half-shell (100a, 100b) is provided with a top rectilinear notch, capable of creating the slot (30) when the same is engaged against the corresponding notch

of the opposite half-shell.

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