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(54) **Push-button operated extendable handle assembly for an umbrella**

(57) A push-button operated extendable handle assembly (100) for opening and closing a canopy of an umbrella (200) includes a primary shell member (40) which is movable axially relative to a secondary shell member (10) secured to a handle-side end of a tubular shaft of the umbrella (200), an upper pushing unit (20) disposed to be operated to release a runner (220) from a lowermost position to an uppermost position for opening the canopy, and a lower pushing unit (30) disposed to be operated to release the runner (220) from the uppermost position to the lowermost position for closing the canopy. The primary shell member (40) is actuated through a transmitting mechanism (61) to move between non-stretched and stretched positions when the runner (220) is moved between the lowermost and uppermost positions for facilitating gripping of the handle assembly (100) in a state of use, and for facilitating carrying and storage of the umbrella (200) in a state of non-use.

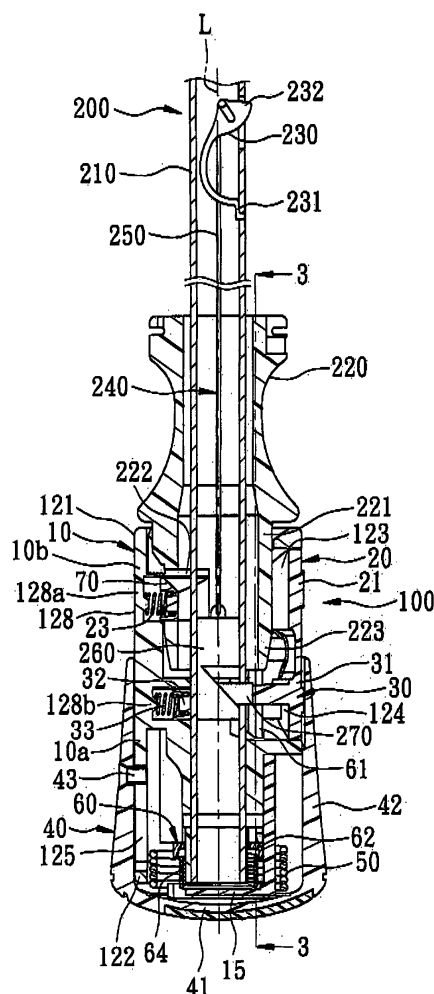


FIG. 2

Description

[0001] This invention relates to an umbrella, more particularly to a push-button operated extendable handle assembly for opening and closing a canopy of an umbrella.

[0002] A conventional umbrella generally has a handle mounted on a lower portion of a center shaft for gripping purposes. Although the handle may be elongated in order to facilitate gripping, it will render the umbrella bulky, thereby resulting in inconvenient carrying and storage. A shorter handle which makes the umbrella relatively compact is, however, inconvenient to grip.

[0003] Moreover, a conventional umbrella capable of automatic opening and closing has an opening control unit and a closing control unit mounted on or in the vicinity of a handle to be operated for opening and closing the umbrella. The user maybe confused as to which control unit he/she has to operate for closing or opening the umbrella.

[0004] The object of the present invention is to provide a push-button operated extendable handle assembly which has a variable length so as to be lengthened for facilitating gripping in a state of use, and to be shortened for facilitating carrying and storage in a state of non-use.

[0005] According to this invention, the push-button operated extendable handle assembly is for opening and closing a canopy of an umbrella. The umbrella includes a tubular shaft having handle-side and top-side ends opposite to each other along an axis, and a runner sliding segment interposed between the handle-side and top-side ends; a runner sleeved on and slidable along the runner sliding segment between uppermost and lowermost positions which correspond to opened and closed positions of the canopy, respectively; a tubular plunger which is sleeved on the runner sliding segment, which extends from the runner along the axis to terminate at a tubular plunging end that is descendable with the runner towards the handle-side end when the runner slides toward the lowermost position, and which has a retaining hole; and a catch member which is disposed in the tubular shaft, and which has an actuated end in the runner sliding segment and proximate to the handle-side end, and a hook end that is opposite to the actuated end, and that extends outwardly of the tubular shaft.

[0006] The push-button operated extendable handle assembly comprises a primary shell member including a bottom mounting wall which is adapted to confront the handle-side end, and primary left and right walls which are spaced apart from each other in a transverse direction, and which extend to terminate at primary left and right upper edges, respectively, so as to define a stretching path therebetween, the primary left and right walls having left and right latching slots, respectively; a thrust transmitting member which includes a rammed end adapted to be thrust by the tubular plunging end so as to displace from a lifted position, where the tubular plunging end is remote from the rammed end, to a depressed position, where the rammed end is engaged with the tu-

bular plunging end, a depressing end that is opposite to the rammed end along the axis, and an actuating intermediate segment that descends with the depressing end along the stretching path; a first biasing member disposed to bias the rammed end towards the lifted position; left and right latch members, each including a pushed end which is forced by the actuating intermediate segment to be movable in the transverse direction between heavily and lightly pressed positions when the rammed end is moved between the depressed position and the lifted position, and a latch end which is movable between an extended position, where the latch end is engaged in a respective one of the left and right latching slots, and which corresponds to the depressed position of the rammed end, and a retracted position, where the latch end is disengaged from the respective one of the left and right latching slots; left and right biasing members disposed to respectively bias the pushed ends of the left and right latch members towards the lightly pressed position; a secondary shell member which is adapted to receive the runner sliding segment, and which is fitted into the primary shell member, the secondary shell member including upper and lower ends such that the primary shell member is movable relative to the secondary shell member between a non-stretched position corresponding to the extended position of the latch end, where the bottom mounting wall is close to the lower end, and a stretched position, where the bottom mounting wall is remote from the lower end, a mounting segment including left and right mounting walls which are spaced apart from each other in the transverse direction to define a lower chamber that is communicated with the stretching path, and that accommodates the left and right latch members, and which confront the primary left and right walls, respectively, the left and right mounting walls having left and right bores which are communicated with the lower chamber, and which, when the rammed end is in the depressed position, are registered with the left and right latching slots, respectively, so as to permit the latch ends to be placed in the extended position, and a manually operated segment interposed between the upper end and the mounting segment, and including front and rear mounting walls which are diametrically spaced apart from each other to define an upper chamber that accommodates the tubular plunger, the rear mounting wall having upper and lower mount regions, the front mounting wall having upper and lower access openings to permit access to the upper and lower mount regions radially and respectively; a retaining member disposed to be movable radially between an engaging position, where the retaining member engages the retaining hole in the lowermost position so as to hold the rammed end in the depressed position against a biasing action of the first biasing member, thereby placing the pushed end in the heavily pressed position, and a disengaging position, where the retaining member retreats to the upper mount region to be disengaged from the retaining hole so as to permit the rammed end to be biased by the first biasing member

to the lifted position, thereby placing the pushed end in the lightly pressed position; a second biasing member disposed to bias the primary shell member to move from the non-stretched position to the stretched position; an upper pushing unit which has an upper push button that is fitted into the upper access opening, and that is movable radially and towards the upper mount region, and an upper actuating end that is moved with the upper push button to bring the retaining member into the disengaging position; a lower pushing unit which has a lower push button that is fitted into the lower access opening, and that is adapted to actuate the actuated end to release the tubular plunging end when being manually pushed radially towards the lower mount region, and a lower actuating end that is disposed opposite to the lower push button in terms of the axis, and that is disposed to be moved with the lower push button; an upper biasing member disposed to bias the upper push button away from the upper mount region; and a lower biasing member disposed to bias the lower push button away from the lower mount region.

[0007] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment of the invention, with reference to the accompanying drawings, in which:

Fig. 1 is an exploded perspective view of the preferred embodiment of a push-button operated extendable handle assembly according to this invention;

Fig. 2 is a fragmentary sectional view of the preferred embodiment when mounted on a tubular shaft of an umbrella and when a runner is in a lowermost position;

Fig. 3 is a partly cross-sectional view taken along lines 3-3 of Fig. 2;

Fig. 4 is a perspective view of the preferred embodiment of Fig. 2;

Fig. 5 is a fragmentary sectional view of the preferred embodiment when a runner is in an uppermost position;

Fig. 6 is a partly cross-sectional view taken along lines 6-6 of Fig. 5; and

Fig. 7 is a perspective view of the preferred embodiment of Fig. 5.

[0008] Referring to Figs. 1 to 3, the preferred embodiment of a push-button operated extendable handle assembly 100 according to the present invention is shown to be used for opening and closing a canopy (not shown) of an umbrella 200. The umbrella 200 includes a tubular shaft 210 having handle-side and top-side ends opposite to each other along an axis (L), and a runner sliding segment interposed between the handle-side and top-side, ends, a runner 220 which is sleeved on and slidable along the runner sliding segment between uppermost and lowermost positions that are proximate to and distal from the top-side end, respectively, and that correspond to

opened and closed positions of the canopy, respectively, a tubular plunger 221 which is sleeved on the runner sliding segment, which extends from the runner 220 along the axis (L) to terminate at a tubular plunging end 223 that is descendable with the runner 220 towards the handle-side end when the runner 220 slides toward the lowermost position, and which has a retaining hole 222, and a catch member 230 which is disposed in the tubular shaft 210, and which has an actuated end 231 in the runner sliding segment and proximate to the handle-side end, and a hook end 232 that is opposite to the actuated end 231, and that extends outwardly of the tubular shaft 210, and a transmitting mechanism 240. The catch member 230 is configured such that the hook end 232 is urged by a biasing force to counteract the gravity of the runner 220 so as to hold the runner 220 in the uppermost position and such that, once the actuated end 231 is actuated against the biasing force, the tubular plunging end 223 descends towards the handle-side end. The transmitting mechanism 240 includes a metal rod 250 connected to the hook end 232, a transmitting piece 260 pivotally connected to the metal rod 250, and a control piece 270 extending radially through the handle-side end to force the transmitting piece 260 to move along the axis (L).

[0009] The push-button operated extendable handle assembly 100 is shown to comprise a primary shell member 40, a transmitting mechanism 60, a secondary shell member 10, and upper and lower button units.

[0010] The primary shell member 40 includes a bottom mounting wall 41 having a periphery and confronting the handle-side end of the tubular shaft 210 along the axis (L), and a primary surrounding wall 42 which includes primary left and right walls 421 (see Fig. 3) that are spaced apart from each other in a transverse direction relative to the axis (L), and that extend from the periphery of the bottom mounting wall 41 to terminate at primary left and right upper edges 431, respectively, so as to define a stretching path therebetween and along the axis (L). The primary left and right walls 421 have left and right latching slots 422, respectively, which are disposed between the primary left and right upper edges 431 and the periphery of the bottom mounting wall 41, respectively. The left and right latching slots 422 extend towards the periphery of the bottom mounting wall 41 so as to provide left and right leeways to be described hereinafter.

[0011] The transmitting mechanism 60 includes a thrust transmitting member 61, a first biasing member 64, left and right latch members 62, and left and right biasing members 63. The thrust transmitting member 61 has a rammed end 614 to be thrust by the tubular plunging end 223 so as to displace from a lifted position, as shown in Figs. 5 and 6, where the tubular plunging end 223 is remote from the rammed end 614, to a depressed position, as shown in Fig. 3, where the rammed end 614 is engaged with the tubular plunging end 223, a depressing end 612 which is opposite to the rammed end 614 along the axis (L), and an actuating intermediate segment 611 which is interposed between the rammed

end 614 and the depressing end 612, and which descends with the depressing end 612 along the stretching path. The actuating intermediate segment 611 has left and right cam surfaces 613. The first biasing member 64 is disposed to bias the thrust transmitting member 61 upwardly, i.e., to bias the rammed end 614 towards the lifted position. Each of the left and right latch members 62 has a pushed end 621 which engages and is forced by a respective one of the left and right cam surfaces 613 to be movable in the transverse direction between heavily and lightly pressed positions that are distal from and proximate to the axis (L) when the rammed end 614 is moved between the depressed position and the lifted position, and a latch end 622 which is opposite to the pushed end 621 in the transverse direction, and which is movable between an extended position, as shown in Fig. 3, where the latch end 622 is engaged in a respective one of the left and right latching slots 422, and which corresponds to the depressed position of the rammed end 614, and a retracted position, as shown in Fig. 6, where the latch end 622 is disengaged from the respective one of the left and right latching slots 422. The left and right biasing members 63 are disposed to respectively bias the pushed ends 621 of the left and right latch members 62 towards the lightly pressed position.

[0012] The secondary shell member 10 is secured to and receives the runner sliding segment of the tubular shaft 210, and is fitted into the primary shell member 40. The secondary shell member 10 has upper and lower ends 121, 122 which are opposite to each other along the axis (L). Thus, the primary shell member 40 is movable relative to the secondary shell member 10 along the axis (L) between a non-stretched position (as shown in Fig. 3) which corresponds to the extended position of the latch ends 622, where the bottom mounting wall 41 is close to the lower end 122, and a stretched position (as shown in Fig. 6), where the bottom mounting wall 41 is remote from the lower end 122. An abutment wall 15 is disposed securely at the lower end 122 such that the first biasing member 64 is disposed to abut against the depressing end 612 and the abutment wall 15 so as to bias the depressing end 612 towards the lifted position.

[0013] A second biasing member 50 is disposed to bias the primary shell member 40 to move from the non-stretched position to the stretched position. The second biasing member 50 is disposed to surround and to be coaxial with the first biasing member 64 about the axis (L) such that the bottom mounting wall 41 of the primary shell member 40 can be moved away from the lower end 122 of the secondary shell member 10 by virtue of the biasing action of the second biasing member 50 when the rammed end 614 is moved to the lifted position.

[0014] The secondary shell member 10 further has a mounting segment (10a) disposed proximate to the lower end 122, and a manually operated segment (10b) interposed between the upper end 121 and the mounting segment (10a). The mounting segment (10a) includes left and right mounting walls 127 (see Fig. 3) which are

spaced apart from each other in the transverse direction to define a lower chamber that is communicated with the stretching path, and that accommodates the left and right latch members 62, and which confront the primary left and right walls 421 in the transverse direction, respectively. The left and right mounting walls 127 have left and right bores 1271 which extend therethrough respectively to be communicated with the lower chamber, and which, when the rammed end 614 is in the depressed position, are registered with the left and right latching slots 422, respectively, to permit the latch ends 622 to be placed in the extended position. The manually operated segment (10b) includes front and rear mounting walls 128 (see Fig. 2) which are diametrically spaced apart from each other relative to the axis (L) to define an upper chamber that surrounds the runner sliding segment of the tubular shaft 210, and that accommodates the tubular plunger 221 when the runner 220 is in the lowermost position. The rear mounting wall 128 has upper and lower mount regions (128a, 128b) that are proximate to and distal from the upper end 121, respectively. The front mounting wall 128 has upper and lower access openings 123, 124 that permit access to the upper and lower mount regions (128a, 128b) radially and respectively. In this embodiment, the upper and lower access openings 123, 124 are communicated with each other.

[0015] With reference to Figs. 1 and 2, the upper button unit includes a retaining member 70, an upper pushing member 20, and an upper biasing member 23. The retaining member 70 is disposed to be movable radially between an engaging position (as shown in Fig. 2), where the retaining member 70 engages the retaining hole 222 in the tubular plunger 221 in the lowermost position, and a disengaging position, where the retaining member 70 retreats to the upper mount region (128a) to be disengaged from the retaining hole 222. The upper pushing member 20 has an upper push button 21 which is fitted into the upper access opening 123, and which is movable radially towards the upper mount region (128a), and an upper actuating end 22 which is moved with the upper push button 21 to bring the retaining member 70 into the disengaging position. In this embodiment, the upper pushing member 20 is integrally formed with the retaining member 70. The upper biasing member 23 is disposed to bias the upper push button 21 away from the upper mount region (108a).

[0016] The lower button unit includes a lower pushing member 30 and a lower biasing member 33. The lower pushing member 30 has a lower push button 31 which is fitted into the lower access opening 124, and which is adapted to actuate the actuated end 231 of the catch member 230 through the transmitting mechanism 240 in a known manner so as to release the tubular plunging end 223 from the catch member 230 when manually pushed radially towards the lower mount region (128b), and a lower actuating end 32 which is disposed opposite to the lower push button 31 in terms of the axis (L), and which is disposed to be moved with the lower push button

31. The lower biasing member 33 is disposed to bias the lower push button 31 away from the lower mount region (108b). In this embodiment, the lower pushing member 30 is integrally formed with the upper pushing member 20 and is made of an elastomeric material such that the upper and lower push buttons 21,31 can be independently manipulated.

[0017] Further, as shown in Figs. 2 and 5, the mounting segment (10a) of the secondary shell member 10 has a concaved keyway 125 which extends towards the lower end 122 to terminate at upper and lower limit regions. The primary shell member 40 has a key 43 which extends transversely to the axis (L) to be slidably engaged in the keyway 125, thereby guiding the bottom mounting wall 41 to move relative to the lower end 122 until the key 43 reaches one of the upper and lower limit regions.

[0018] When the push-button operated extendable handle assembly of this invention is in the state shown in Figs. 2 to 4, the retaining member 70 is in the engaging position, i.e. the retaining member 70 engages the retaining hole 222, so as to hold the rammed end 614 in the depressed position against a biasing action of the first biasing member 64, thereby placing the pushed ends 621 of the latch members 62 in the heavily pressed position. Thus, the primary shell member 40 is in the non-stretched position, and the lower pushing member 30 is retreated into the primary shell member 40 to prevent an undesired operation.

[0019] As shown in Figs. 5 to 7, when the user pushes the upper push button 21 to move the retaining member 70 to the disengaging position against the biasing action of the lower biasing member 33, i.e. the retaining member 70 is disengaged from the retaining hole 222, the rammed end 614 is biased by the first biasing member 64 to the lifted position so as to push the runner 220 to the uppermost position for opening the canopy (not shown) of the umbrella 200. At this time, due to the engagement of the cam surfaces 613 with the pushed ends 621, the pushed ends 621 are moved by the biasing members 63 to the lightly pressed position, and the latch ends 622 are moved to the retracted position, i.e. the latch ends 622 are disengaged from the latching slots 422. Hence, by virtue of the biasing action of the second biasing member 50, the primary shell member 40 is moved to the stretched position, and the lower pushing member 30 is exposed to permit operation for closing the umbrella 200.

[0020] When it is desired to close the umbrella 200, the user pushes the lower push button 31 to release the runner 220 from the catch member 230 so as to permit the runner 220 to move to the lowermost position such that the tubular plunger 221 is moved into the upper chamber in the secondary shell member 10 to place the retaining member 70 in the retaining hole 222. At the same time, the rammed end 614 is forced by the tubular plunging end 223 to the depressed position, and the latch ends 622 are moved to the retracted position, i.e. the latch ends 622 are inserted into the latching slots 422 so as to hold the primary shell member 40 in the non-

stretched position. The leeways provided by the latching slots 422 facilitate insertion and engagement of the latch ends 622 therein.

[0021] As illustrated, in the push-button operated extendable handle assembly 100 of this invention, when the runner 220 is in the lowermost position corresponding the closed position of the canopy of the umbrella 200, the primary shell member 40 is in the non-stretched position so that the assembly 100 has a relatively small length, thereby making the umbrella 200 more compact for carrying and storage. Moreover, the lower push button 31 can be retreated into the primary shell member 40 to prevent undesired operation thereof. When the runner 220 is in the uppermost position corresponding the opened position of the canopy of the umbrella 200, the primary shell member 40 is in the stretched position so that the assembly 100 has a relatively large length, thereby lengthening the umbrella 200 to facilitate gripping of the assembly 100.

Claims

1. A push-button operated extendable handle assembly for opening and closing a canopy of an umbrella, the umbrella including
 - a tubular shaft (210) having handle-side and top-side ends opposite to each other along an axis (L), and
 - a runner sliding segment interposed between the handle-side and top-side ends;
 - a runner (220) sleeved on and slidable along the runner sliding segment between uppermost and lowermost positions which are proximate to and distal from the top-side end, respectively, and which correspond to opened and closed positions of the canopy, respectively;
 - a tubular plunger (221) which is sleeved on the runner sliding segment, and which extends from the runner (220) along the axis (L) to terminate at a tubular plunging end (223) that is descendable with the runner (220) towards the handle-side end when the runner (220) slides toward the lowermost position, said tubular plunger (221) having a retaining hole (222); and
 - a catch member (230) disposed in the tubular shaft (210), and having an actuated end (231) in the runner sliding segment and proximate to the handle-side end, and a hook end (232) which is opposite to the actuated end (231), and which extends outwardly of the tubular shaft (210), the catch member (230) being configured such that the hook end (232) is urged by a biasing force to counteract the gravity of the runner (220) so as to hold the runner (220) in the uppermost position and such that, once the actuated end (231) is actuated against the biasing force, the tubular plunging end (223) descends towards the handle-side end, **characterized in that** said push-button operated extendable handle assembly com-

prises:

a primary shell member (40) including a bottom mounting wall (41) having a periphery and adapted to confront the handle-side end along the axis (L), and primary left and right walls (421) which are spaced apart from each other in a transverse direction relative to the axis (L), and which extend from said periphery to terminate at primary left and right upper edges (431), respectively, so as to define a stretching path therebetween and along the axis (L), said primary left and right walls (421) having left and right latching slots (422), respectively;

a thrust transmitting member (61) which includes a rammed end (614) adapted to be thrust by the tubular plunging end (223) so as to displace from a lifted position, where the tubular plunging end (223) is remote from said rammed end (614), to a depressed position, where said rammed end (614) is engaged with the tubular plunging end (223), a depressing end (612) that is opposite to said rammed end (614) along the axis (L), and an actuating intermediate segment (611) that is interposed between said rammed end (614) and said depressing end (612), and that descends with said depressing end (612) along the stretching path;

a first biasing member (64) disposed to bias said rammed end (614) towards the lifted position; left and right latch members (62), each including a pushed end (621) which is forced by said actuating intermediate segment (611) to be movable in the transverse direction between heavily and lightly pressed positions that are distal from and proximate to the axis (L), respectively, when said rammed end (614) is moved between the depressed position and the lifted position, and a latch end (622) which is opposite to said pushed end (621) in the transverse direction, and which is movable between an extended position, where said latch end (622) is engaged in a respective one of said left and right latching slots (422), and which corresponds to the depressed position of said rammed end (614), and a retracted position, where said latch end (622) is disengaged from the respective one of said left and right latching slots (422);

left and right biasing members (63) disposed to respectively bias said pushed ends (621) of said left and right latch members (62) towards the lightly pressed position;

a secondary shell member (10) which is adapted to receive the runner sliding segment, and which is fitted into said primary shell member (40), said secondary shell member (10) including upper and lower ends (121, 122) which are opposite to each other along the axis such that said primary shell member (40) is movable relative to said secondary shell member (10) along the axis (L) between a non-stretched position corresponding to the extended position of said latch end (622), where said

bottom mounting wall (41) is close to said lower end (122), and a stretched position, where said bottom mounting wall (41) is remote from said lower end (122),

a mounting segment (10a) disposed proximate to said lower end (122), and including left and right mounting walls (127) which are spaced apart from each other in the transverse direction to define a lower chamber that is communicated with the stretching path, and that accommodates said left and right latch members (62), and which confront said primary left and right walls (421) in the transverse direction, respectively, said left and right mounting walls (127) having left and right bores (1271) which extend therethrough respectively to be communicated with said lower chamber, and which, when said rammed end (614) is in the depressed position, are registered with said left and right latching slots (422), respectively, so as to permit said latch ends (622) to be placed in the extended position, and

a manually operated segment (10b) interposed between said upper end (121) and said mounting segment (10a), and including front and rear mounting walls (128) which are diametrically spaced apart from each other relative to the axis (L) to define an upper chamber that is adapted to surround the runner sliding segment, and that accommodates the tubular plunger (221) when the runner (220) is in the lowermost position, said rear mounting wall (128) having upper and lower mount regions (128a, 128b) that are proximate to and distal from said upper end (121), respectively, said front mounting wall having upper and lower access openings (123, 124) to permit access to said upper and lower mount regions (128a, 128b) radially and respectively;

a retaining member (70) disposed to be movable radially between an engaging position, where said retaining member (70) engages said retaining hole (222) in the lowermost position so as to hold said rammed end (614) in the depressed position against a biasing action of said first biasing member (64), thereby placing said pushed end (621) in the heavily pressed position, and a disengaging position, where said retaining member (70) retreats to said upper mount region (128a) to be disengaged from said retaining hole (222) so as to permit said rammed end (614) to be biased by said first biasing member (64) to the lifted position, thereby placing said pushed end (621) in the lightly pressed position;

a second biasing member (50) disposed to bias said primary shell member (40) to move from the non-stretched position to the stretched position;

an upper pushing unit (20) which has an upper push button (21) that is fitted into said upper access opening (123), and that is movable radially and towards said upper mount region (128a), and an upper actuating end that is moved with said upper push button (21) to bring said retaining member (70) into the dis-

engaging position;

a lower pushing unit (30) which has a lower push button (31) that is fitted into said lower access opening (124), and that is adapted to actuate the actuated end (231) to release the tubular plunging end (223) when being manually pushed radially towards said lower mount region (128b), and a lower actuating end (32) that is disposed opposite to said lower push button (31) in terms of the axis (L), and that is disposed to be moved with said lower push button (31); an upper biasing member (23) disposed to bias said upper push button (21) away from said upper mount region (108a); and a lower biasing member (33) disposed to bias said lower push button (31) away from said lower mount region (108b).

2. The push-button operated extendable handle assembly of Claim 1, **characterized in that** said upper and lower access openings (123, 124) are communicated with each other, and said retaining member (70) and said lower pushing member (30) are integrally formed with said upper pushing member (20).
3. The push-button operated extendable handle assembly of Claim 1, **characterized in that** said first biasing member (64) is disposed between said depressing end (612) and said lower end (122) of said secondary shell member (10) so as to bias said depressing end (612) towards the lifted position.
4. The push-button operated extendable handle assembly of Claim 3, **characterized in that** said second biasing member (50) is disposed to surround and to be coaxial with said first biasing member (64) about the axis (L), said bottom mounting wall (41) of said primary shell member (40) being moved away from said lower end (122) of said secondary shell member (10) by virtue of a biasing action of said second biasing member (50) when said rammed end (614) is moved to the lifted position.
5. The push-button operated extendable handle assembly of Claim 1, **characterized in that** said mounting segment (10a) of said secondary shell member (10) has a keyway (125) which extends towards said lower end (122) to terminate at a lower limit region, said primary shell member (40) having a key (43) which extends transversely to the axis (L) to be slidably engaged in said keyway (125), thereby guiding said bottom mounting wall (41) to move away from said lower end (122) until said key (43) reaches said lower limit region.
6. The push-button operated extendable handle assembly of Claim 1, **characterized in that** said actuating intermediate segment (611) has left and right cam surfaces (613) which respectively engage said

pushed ends (621) of said left and right latch members (62) in the transverse direction such that when said rammed end (614) is moved to the lifted position by said first biasing member (64), said left and right cam surfaces (613) force said pushed ends (621) to the heavily pressed position, thereby placing said latch ends (622) in the extended position.

7. The push-button operated extendable handle assembly of Claim 1, **characterized in that** said left and right latching slots (422) extend towards said periphery of said bottom mounting wall (41) so as to provide left and right leeways, thereby facilitating insertion and engagement of said latch ends (622) of said left and right latch members (62) into said left and right latching slots (422).

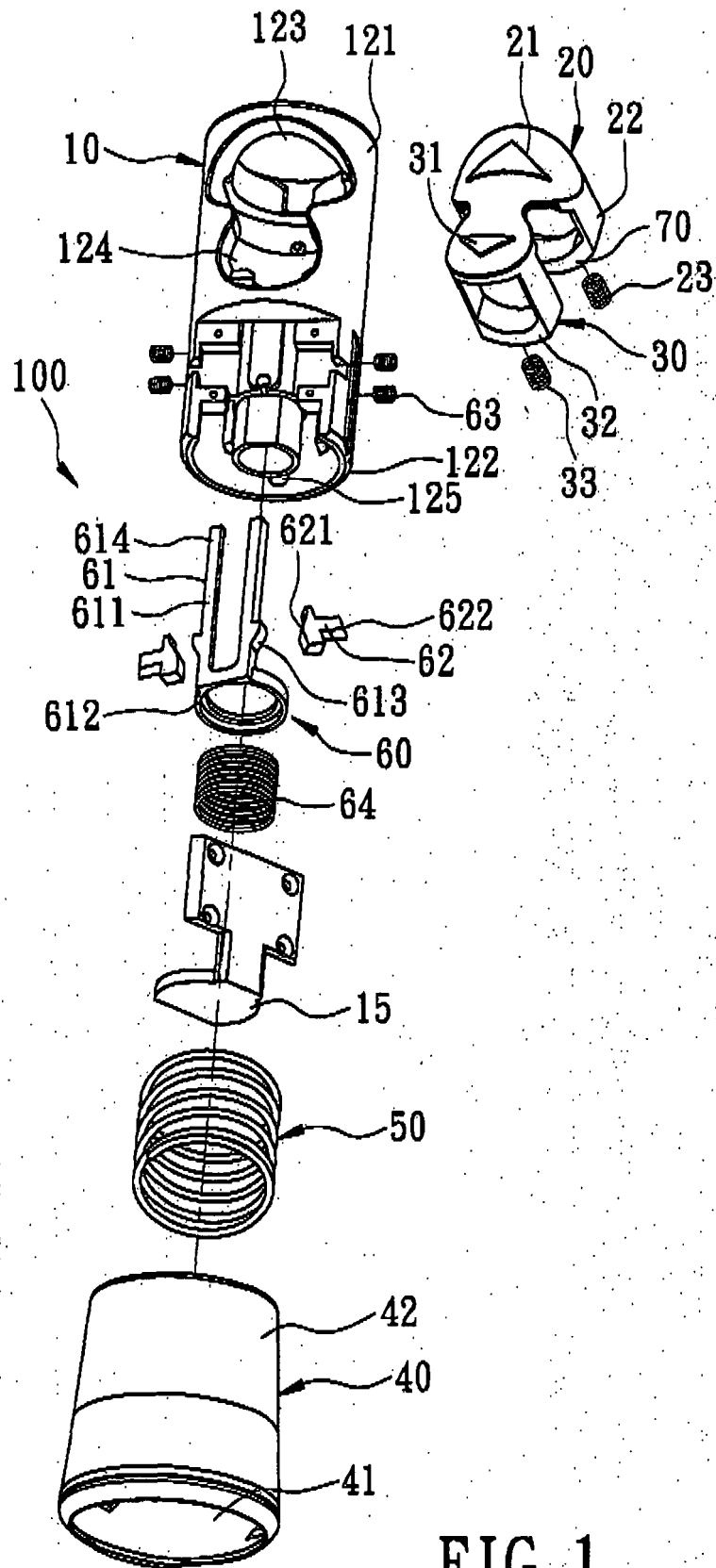


FIG. 1

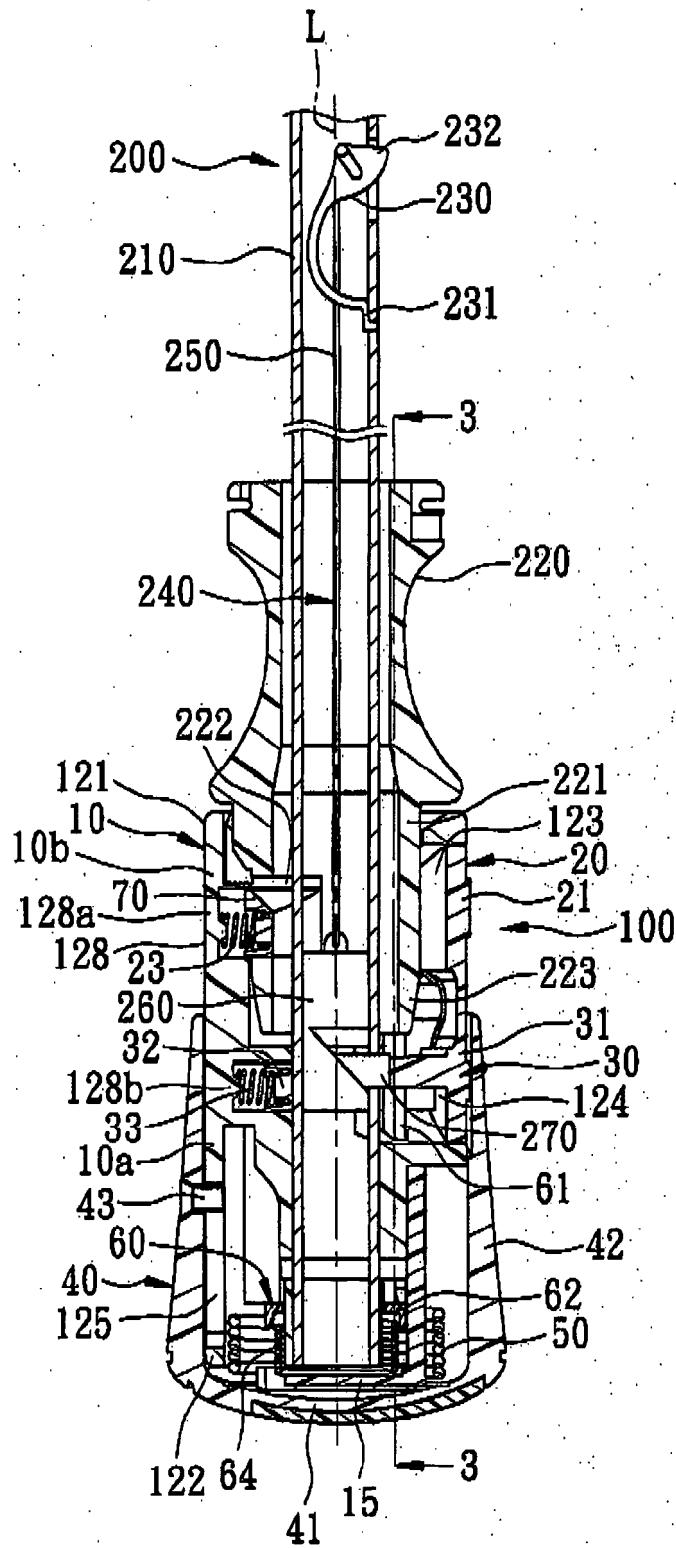


FIG. 2

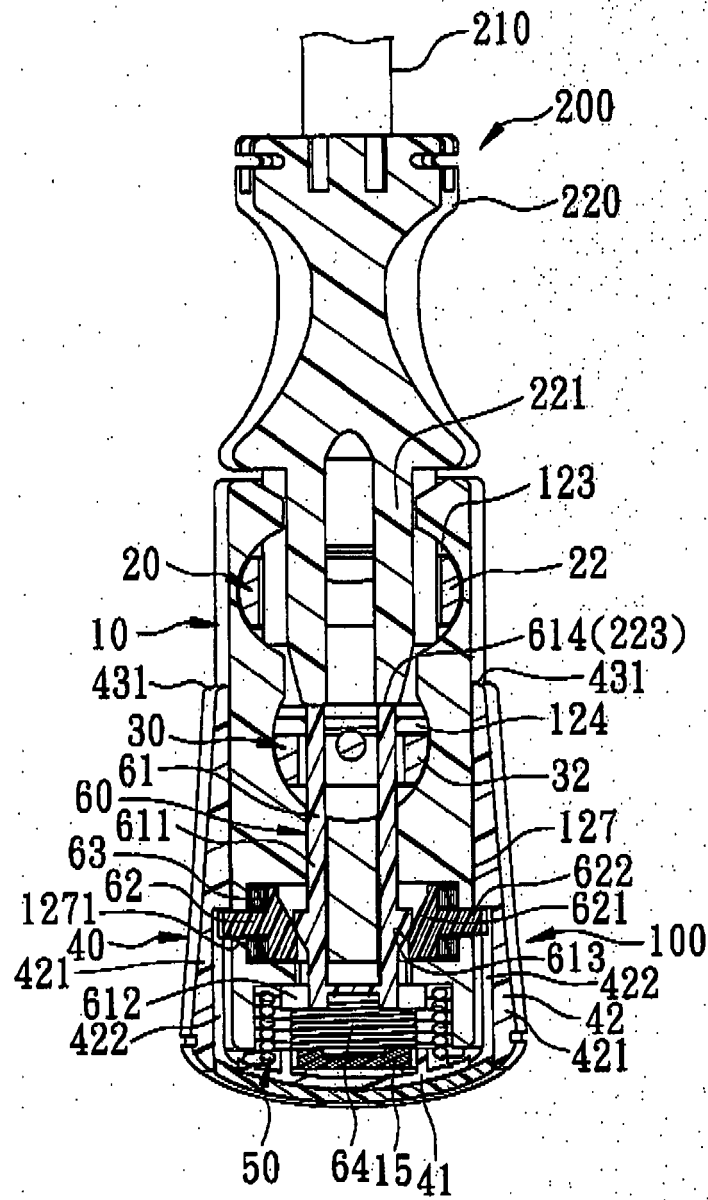


FIG. 3

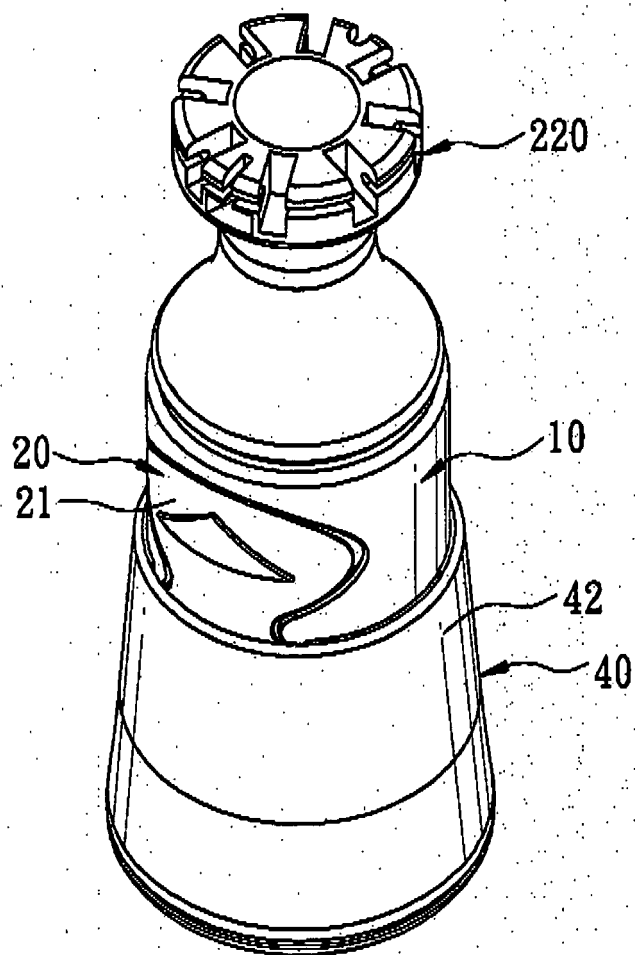


FIG. 4

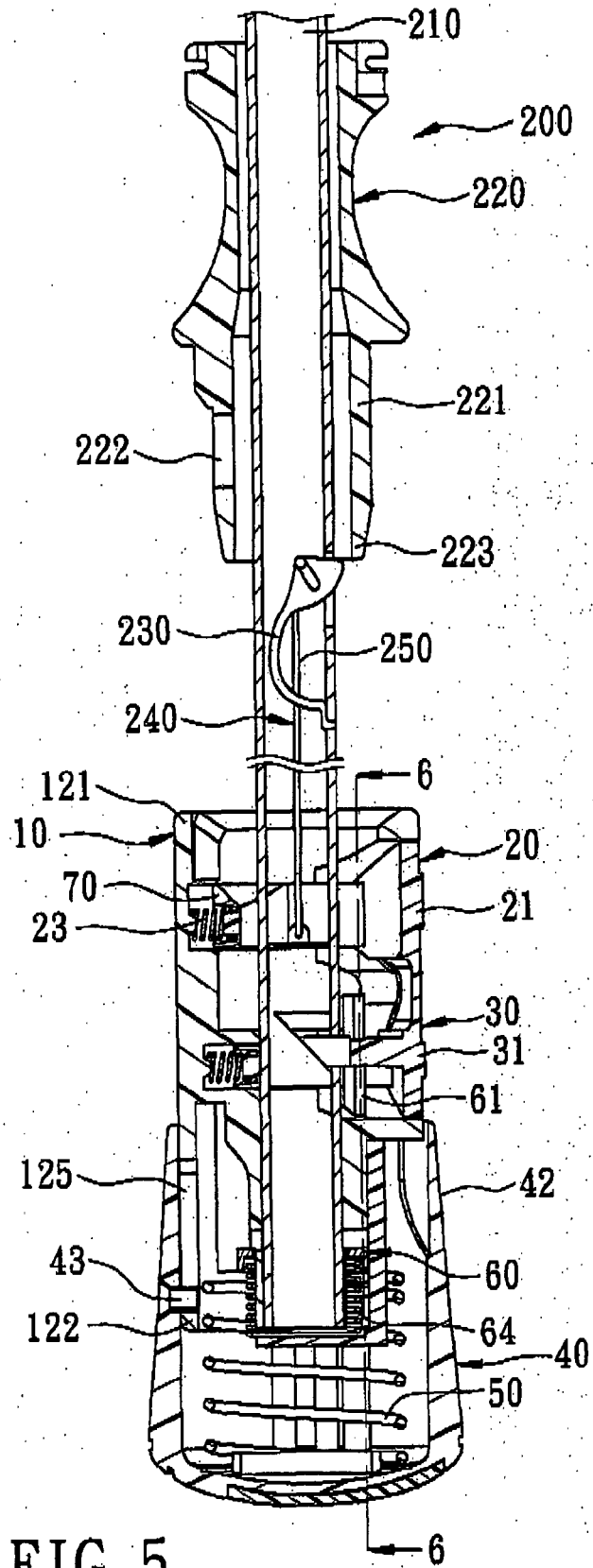


FIG. 5

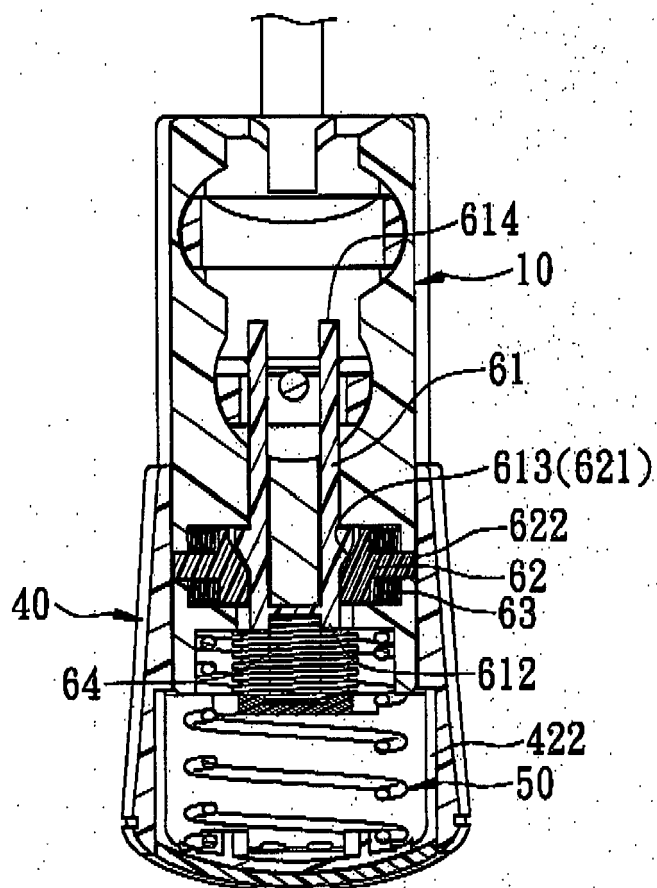


FIG. 6

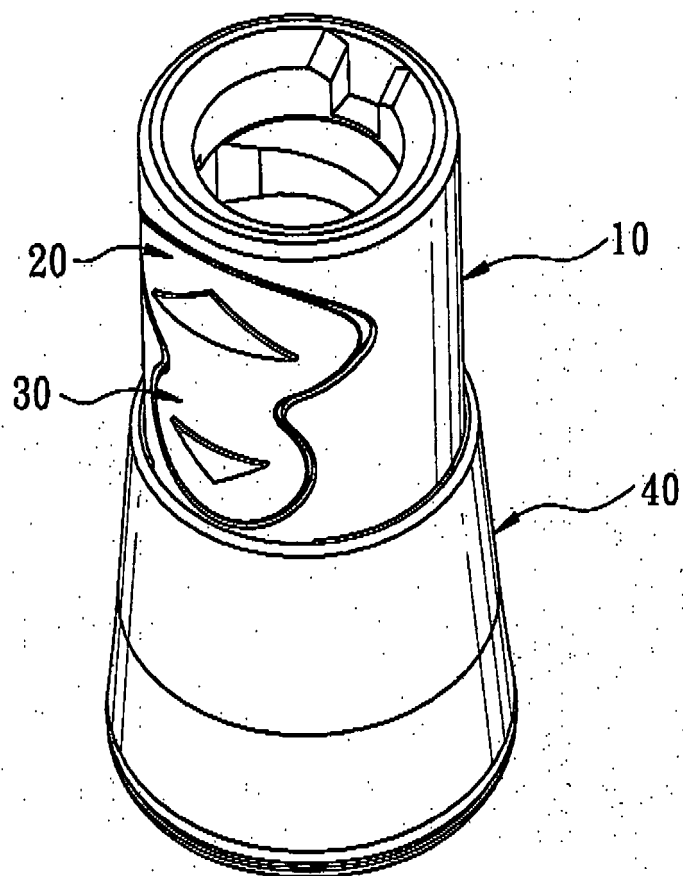


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 2681

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search		Date of completion of the search	Examiner
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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			

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