WAR GAME TOY GRENADE

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ABSTRACT

The toy grenade is provided with a non-destructive main casing. Smoke simulated powder is filled in a powder container in communication with a compression air cylinder. A plunger rod slidably mounted on a safety support is located at the top of the main casing. The plunger rod is operative by the removal of a pivot arm to release the compressed air from the air cylinder to force the powder to emit under pressure from two emission openings at the side wall of the main casing to provide simulation of the operation of a grenade.
WAR GAME TOY GRENADE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

This invention relates to a toy grenade usable in playing a war game for creating a simulated warfare environment.

[0002] 2. Background Art

War game is very popular among some adults, in which opposing teams of people are dressed in army fatigues and using simulated weapons for shooting nonharmful ammunition at one another. The weapons impose on the target with a color mark to indicate that the latter has been hit in a simulated manner. Toy grenades are also used in the war game to create a simulated condition of a grenade explosion by the discharge of a mass amount of smoke consisting of white or colored powder. Presently known toy grenades are generally self destructive in use and are complex in construction. Thus, the use of such toy grenades increases the expense in playing the war game and the destroyed toys inherently contribute to the unnecessary creation of garbage.

[0003] A re-usable toy grenade is shown in U.S. patent application Ser. No. 11/407,364 filed on Apr. 20, 2006, by the same inventors of the present invention in which the grenade may be re-assembled after use. Such re-usable toy greatly reduces the expense in playing the war game. However, the outer enclosure of toy grenade therein consists of two separable half shells. In use, the half shells as most of the internal components may disperse over a large area and may thus become unretrievable for re-assembly for re-use.

SUMMARY OF THE INVENTION

[0004] It is a principal object of the present invention to provide a toy grenade which contains no separable components in use so that it may be easily recharged for re-use after operation.

[0005] It is another object of the present invention to provide a toy grenade which may be easily disassembled and re-assembled.

[0006] It is another object of the present invention to provide a toy grenade which is simple in construction and easy to use.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the drawings,

[0008] FIG. 1 is a side perspective elevation view of the toy grenade of the present invention.

[0009] FIG. 2 is a rear side perspective elevation view therein.

[0010] FIG. 3 is a side perspective elevation view of the toy grenade with the pivot arm and the safety pin removed showing the plunger rod and the compression spring mounted slidable within the safety support.

[0011] FIG. 4 is an exploded perspective elevation view of the toy grenade showing the component parts therein.

[0012] FIG. 5 is an enlarged partial sectional side elevation view of the top cover and the safety support of the toy grenade.

[0013] FIG. 6 is a bottom elevation view of the top cover shown in FIG. 5.

[0014] FIG. 7 is a sectional side elevation view along section line VII-VII of FIG. 5 of the top cover showing the duct for conducting the smoke powder for emitting from the toy grenade.

[0015] FIG. 8 is a perspective front and top elevation of the powder container showing the location of the torsion springs for retaining the sealing head of the plunger momentarily against the force of the plunger compression spring.

[0016] FIG. 9 is a perspective bottom elevation view of the powder container showing the location of the coupling tube for connecting to the air conducting tube of the compressed air cylinder.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] With reference to the drawings in which like reference numerals designate corresponding parts in the various views, the toy grenade 10 has a cylindrical main casing 11 with a top opening 12 and a small access opening 13 formed at the center of its bottom panel 14. Threads 15 are formed at the outer surface of the top edge portion of the top opening 12. A top cover 16 is mounted at the top opening 12 of the casing 11 with complementary threads 17 provided in the inner side wall of its lower edge portion. The threads 15 and the complementary threads 17 engage with one another threadingly for mounting the top cover 16 to the main casing 11 in an airtight manner.

[0018] As best shown in FIGS. 4 to 7, the short cylindrical top cover 16 has a central opening 18 formed in its top panel 19, and it has a diameter equal to that of the main casing 11. Two tubular ducts 20 and 21 extend diametrically from the central opening 18 at the underside of the top panel 19 to the two sides of the top cover 16. Two powder emitting openings 22 and 23 are formed at the side wall of the top cover 16. The powder emitting openings 22 and 23 communicate with the central opening 18 through the tubular channels 20 and 21 respectively. A safety support 24 is mounted on top of the top cover 16. A vertical cylindrical through opening 25 is formed in the safety support 24. The through opening 25 has a larger diameter than the diameter of the central opening 18 of the top panel 19. A generally T-shaped sleeve 26 is sandwiched between the top panel 19 and the safety support 24 and has an upwardly extending tubular section 27 extending upwards into the through opening 25 of the safety support 24. The sleeve 26 has an inner diameter equal to that of the central opening 18 and an outer diameter smaller than the diameter of the through opening 25. A plunger rod 28 is located within the safety support 24. The plunger rod 28 has a middle section 29 having a diameter equal to the inner diameter of the sleeve 26, an upper section 30 having a diameter larger than the inner diameter of the sleeve 26 and smaller than the inner diameter of the through opening 25, and a lower section 31 having a diameter smaller than the diameter of the central opening 18 of the top cover 16. A top plate 32 is formed at the top end of the plunger rod 28 and a sealing head 33 is formed at the lower end of the plunger rod 28. The top plate 32 has a diameter larger than the outer diameter equal to or slightly smaller than the through opening 25 of the safety support 24. A sealing O-ring 34 is mounted on the plunger rod 28 and located between the middle section 28 and the upper section 30. A second sealing O-ring 35 is mounted at a sealing head 33 at the lower end of the plunger rod 28. A compression spring 36 surrounding the plunger rod 28 and extending between the top plate 32 of the plunger rod 28 and the top panel 19 of the
safety support 24. The compression spring 36 has a diameter larger than the outer diameter of the upstanding tubular section 27 of the sleeve 26 and smaller than the inner diameter of the through opening 25 so that the plunger rod 28 is operable to position slidably in an up and down movement relative to the safety support 24 against the spring force of the compression spring 36.

[0021] A compressed air cylinder 37 is located within the lower portion of the main casing 11. The air cylinder 37 has a top cover 38 mounted to the air cylinder 37 in an airtight manner with mounting threads provided on both the inner top edge portion of the air cylinder 37 and the outer edge portion of the top cover 38. An air conducting tube 39 mounted to the top cover with a mounting nut from the underside of the top cover and extends upwards from the top cover 38. A sealing O-ring 40 is mounted around the top end of the air conducting tube 39. An inlet air valve 41 is mounted at the bottom of the air cylinder 37. The inlet air valve 41 is aligned with the bottom opening 13 of the main casing 11 when the air cylinder 37 is located inside the main casing 11.

[0022] A cylindrical powder container 42 is mountable over the compressed air cylinder 37 within the main casing 11. The powder container 42 consists of a cylindrical casing 43 and a top cover 44 threadingly engaged with one another in an airtight manner. A coupling tube 45 extends downwards from the center of the bottom of the casing 43. The inside diameter of the coupling tube 45 is equal to the outer diameter of the O-ring 40. The air conducting tube 39 extends upwards inside the coupling tube 45 of the powder container 42 when the cylindrical powder container 42 and the compressed air cylinder 37 are mounted together and located within the main casing 11. The O-ring 40 provides an air seal engagement between the coupling tube 45 and the air conducting tube 39. An outlet opening 46 is formed in the top cover 44 of the powder container 42. The outlet opening 46 has a diameter equal to the outer diameter of the O-ring 34 on the sealing head 35 of the plunger rod 28. Two torsion springs 47 and 48 are mounted on the top of the top cover 44 of the powder container. The springs 47 and 48 is a spring arm portion 49 across opposite edge portions of the outlet opening 46. When the powder container 42 and the compressed air cylinder 42 are located within the main casing 11, the plunger rod 28 may be pressed downwards to engage the lower end of the plunger rod 28 within the outlet opening 46 of the powder container top cover 44. The O-ring 34 provides an airtight engagement of the plunger rod 28 with the outlet opening 46. The spring arm portion 49 of the torsion springs 47 and 48 provides a temporary holding means for clamping the plunger rod 28 in the depressed position against the spring force of the compression spring 36 which urges the plunger rod 28 to return to its upper normal position. The retaining force of the torsion springs 47 and 48 and the biasing force of the compression spring 36 may be designed such that the plunger rod 28 would be retained in the depressed position for a selected predetermined period of time before the biasing spring force of the compression spring 36 would push the plunger rod 28 back to the normal upper position.

[0023] The plunger rod 28 is normally held in a depressed position by a generally inverted L-shaped operating arm 50 which has a holding plate portion 51 and a pivot arm 52 extending downward at an angle to the holding plate portion 51. Two bifurcated hooks 53 and 54 are formed at the free edge of the holding plate portion 51. The hooks 53 and 54 are slidably engageable with two mounting arms 55 and 56 extending sideways from the top portion of the safety support 24 such that the operating arm 50 may be pivoted downwards with the holding plate portion 51 pressing down on the top plate 32 of the plunger rod 28 to retain the latter in the depressed lower position. The operating arm 50 is held in the downward position with a safety pin 57 inserted through two openings 58 and 59 formed in opposite side plates 60 and 61 formed at the side edge of the upper end of the pivot arm 52. The openings 58 and 59 are aligned with a horizontal through opening 62 so that the safety pin 57 may be inserted through the openings 58, 59 and 62 to retain the operating arm 50 in the downward pivoted position. A ring 63 is provided with the safety pin 57 to facilitate its insertion and removal.

[0024] In assembly, the powder container 42 is filled with a smoke creating powder such as talcum powder which may be dyed with a desirable color. The powder container 42 is mounted to the compressed air cylinder 37 with the air conducting tube 39 engages within the coupling tube 45 of the powder container 42. After mounted together, they are located within the main casing 11 and then covered with the top cover 16. The pivot arm 50 is mounted to the safety support 24 with the mounting hooks 53 and 54 slidably engaging with the mounting arms 55 and 56 and then pivoted downwards with the holding plate portion 51 pressing the top plate 32 of the plunger rod 28 downwards against the spring force of the compression spring 36. With the plunger rod 28 pressed downwards, its lower sealing head 33 will force the spring arm portion 29 of the torsion springs 47 and 48 apart to engage within the outlet opening 46 of the powder container 42. The safety pin 57 is inserted into the opening 62 to retained the pivot arm 50 in the pivoted downward normal position. The compressed air cylinder 37 is then filled with compressed air through the air valve 41.

[0025] In use, the safety pin 57 is pulled out for removing the pivot arm 50 from the safety support 24 such that the plunger rod 28 will be pushed upwards to its upper position after a predetermined period of time, by the spring force of the compression spring 36. Thus, the lower sealing head 33 of the plunger rod 28 will disengage from the outlet opening 18 of the powder container 42. The compressed air in the compressed air cylinder 37 will flow through the air conducting tube 39 into the powder container 42 to force the smoke powder to flow through the outlet opening 18 and the ducts 20 and 21 to emit under the compressed air pressure from the toy grenade through the powder emitting openings 22 and 23 to provide the desired smoke simulation. No component parts would become loss during use as in the destructive type of grenade.

[0026] After use, the grenade may be easily reassembled for further use by simply removing the powder container 42 from the assembly and refilling it with smoke powder and then reassembling it within the main casing 11. The pivot arm 50 is again mounted back to the safety support 24 with the safety pin 57, and the compressed air cylinder 37 is then recharged with compressed air through the air inlet valve 41.

[0027] While the present invention has been shown and described in the preferred embodiment thereof, it will be apparent that various modifications can be made therein without departing from the spirit or essential attributes thereof, and it is desired therefore that only such limitations be placed thereon as are imposed by the appended claim.
What we claim is:
1. A toy grenade comprising:
   a main casing having a top cover portion removably
   mounted thereon in an airtight manner,
   a smoke powder container and a compressed air cylinder
   mounted within said main casing, said powder container
   being filled with a powder material, and said compressed
   air cylinder having an air conducting tube engaged with
   a coupling tube of said powder container,
   a safety support mounted on said top cover portion and said
   safety support having a vertical cylindrical through
   opening formed therein, and said through opening being
   aligned with a top opening formed in said top cover
   portion of said main casing,
   an central opening formed at a top cover of said powder
   container, and said central opening being aligned with
   said top opening of said top cover portion of said main
   casing,
   two ducts formed at an underside of said top cover portion
   of said main casing and extending outwards from said
   top opening to opposite side walls of said top cover
   portion of said main casing, said ducts being in commu-
   nication with two powder smoke emission openings
   formed at opposite side walls of said top cover portion
   of said main casing, and said smoke emission openings
   being in communication with said top opening through
   said ducts,
   a plunger rod slidably mounted in said safety support, said
   plunger rod being normally biased by a compression
   spring to locate at an upper position with a sealing head
   at a lower end therein spaced from said central opening
   of said top cover of said powder container, said plunger
   rod being pushable downwards to a lower position with
   said sealing head engaged within said central opening of
   said powder container,
   an inverted L-shaped pivot arm removably mounted to said
   safety support, said pivot arm having a holding plate
   portion depressing on a top end of said plunger rod to
   retain said plunger rod in said lower position,
   a safety pin removably mounted to said safety support for
   retaining said pivot arm mounted to said safety support,
   an inlet air valve located at a bottom of said compressed air
cylinder, said inlet air valve being accessible through a
bottom opening formed in said main casing, and said
compressed air cylinder being chargeable with com-
pressed air through said inlet air valve.
2. A toy grenade according to claim 1 including an O-ring
   mounted on said sealing head to provide an air tight en-
geeement between said sealing head and said outlet opening
   of said powder container.
3. A toy grenade according to claim 2 including two torsion
   springs mounted on said powder container, said two torsion
   springs having a arm portion located at opposite sides across
   an edge portion of said outlet opening, said arm portion of
   said torsion springs engageable with said sealing head of said
   plunger rod for temporarily retaining said plunger rod in said
   lower position.
4. A toy grenade according to claim 3 including a sleeve
   having an upstanding tubular portion extending into a vertical
   cylindrical opening in said safety support, said plunger rod
   having a middle section slidably engaged with said upstand-
   ing tubing portion of said sleeve, and said compression
   spring surrounding said upstanding tubing portion of said
   sleeve.
5. A toy grenade according to claim 4 including a second
   O-ring mounted on said plunger rod, said second O-ring
   being engageable with a top end of said sleeve for sealing any
   air leakage from said main casing through said sleeve.
6. A toy grenade according to claim 5 wherein said pivot
   arm has two bifurcated hooks formed at a free edge of said
   holding plate portion, said hooks are slidably engageable with
   two rods extending sideways from said safety support to
   facilitate pivotal movement of said pivot arm relative to
   said safety support.
7. A toy grenade according to claim 6 including a ring
   mounted on said safety pin and operative to facilitate removal
   of said safety pin from said safety support.
8. A toy grenade according to claim 7 wherein said powder
   material in said powder container is dyed with a selected
   color.

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