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(54) **Structure of grenade for toy gun**

Struktur einer Granate für eine Spielzeugpistole

Structure de grenade pour pistolet jouet

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EP 2 573 503 B1

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Description

(a) Technical Field of the Invention

[0001] The present invention generally relates to a structure of grenade for toy gun, and more particularly to a grenade structure that receives compressed air to be filled therein for storage of the compressed air in a storage chamber so that in percussion, the compressed air stored in the storage chamber is released to eject BB bullets or paintballs contained in a magazine compartment, making the operation easy and convenient.

(b) Description of the Prior Art

[0002] Toy guns that are used in survival games for shooting with BB bullets or paintballs are made so real and also exciting, making them widely popular and appealing to the general people. The toy guns that are available in the market for shooting BB bullets or paintballs are often structured for shooting only BB bullets and paintballs in succession. This lowers the interesting and exciting of playing the game. Apparently, a grenade launcher that may simultaneously shoot a number of BB bullets or paintballs provides a strong and heavy fire and is thus more appealing to the game players. One solution is to load a grenade cartridge that contains a number of BB bullets or paintballs and a pressure accumulation structure of compressed air in a grenade launcher and then activate a trigger of the grenade launcher to launch the grenade cartridge so that the compressed air released from the pressure accumulation structure instantaneously project the BB bullets or the paintballs.

[0003] A grenade of this type is for example disclosed by patent publication US 7 059 316 B1.

[0004] The present invention aims to provide a structure of grenade for toy gun that makes use of an alternative gas supply and release mechanism.

SUMMARY OF THE INVENTION

[0005] The primary objective of the present invention is to provide a structure of grenade for toy gun, which receives compressed air to be filled in the grenade for storage of the compressed air in a storage chamber so that in percussion, the compressed air stored in the storage chamber is released to eject BB bullets or paintballs contained in a bullet compartment, making the operation easy and convenient.

[0006] The grenade for toy gun generally comprises a front cap, a bullet compartment, a storage chamber, and an actuation rod assembly. The bullet compartment comprises a plurality of circumferentially arranged accommodation cylinders to receive BB bullets or paintballs to be loaded therein. The storage chamber forms circumferential raised walls. The actuation rod assembly is hollow and has a front end forming an air inlet opening in which a check valve is mounted and a rear end forming an air

output opening and circumferential gasket rings. The gasket rings are respectively set in engagement with the raised wall to hermetically seal the storage chamber, whereby compressed air is allowed to feed through the air inlet opening and the compressed air is discharged through the air output opening to accumulate in the storage chamber. In percussion, the actuation rod assembly is caused to move forward to have the gasket ring disengaging from the raised wall of the storage chamber so as to release the compressed air stored in the storage chamber to instantaneously eject the BB bullets or paintballs received in the bullet compartment.

[0007] In the grenade described above, the plurality of accommodation cylinders arranged in the bullet compartment each has a front opening that has an inner side portion to which a flexible rubber ring is mounted so that after the BB bullets or paintballs are positioned into the accommodation cylinders, the flexible rubber rings block and prevent the BB bullets or paintballs from dropping off.

[0008] The foregoing objectives and summary provide only a brief introduction to the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference numerals refer to identical or similar parts.

[0009] Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIGS. 1 and 2 are respectively an exploded view and a perspective view of a grenade according to the present invention.

FIG 3 is a cross-sectional view of the grenade according to the present invention.

FIG 4 is a cross-sectional view demonstrating operations of feeding air and loading BB bullets or paintballs according to the present invention.

FIG 5 is a side elevational view illustrating an application of the present invention.

FIG 6 is a cross-sectional view illustrating a percussion operation of the present invention.

FIG 7 is another cross-sectional view illustrating the percussion operation of the present invention.

FIG 8 is a further cross-sectional view illustrating the percussion operation of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] The following descriptions are exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

[0012] Referring to FIGS. 1, 2, and 3, which are respectively an exploded view, a perspective view, and a cross-sectional view of a grenade constructed in accordance with the present invention, these drawings show that a grenade according to the present invention comprises a front cap 1, a bullet compartment 2, a storage chamber 3, and an actuation rod assembly 4. The bullet compartment 2 comprises a centrally-formed through bore 21, which has a circumference around which a plurality of circumferentially arranged accommodation cylinders 22 is arranged to allow each of the accommodation cylinders 22 to receive, via a front opening thereof, and load BB bullets or paintballs therein. The accommodation cylinders 22 are each provided at an inner side portion thereof with a flexible rubber ring 23, so that the BB bullets or paintballs are forced to move through the flexible rubber ring 23 in order to be introduced into each of the accommodation cylinders 22 and through being blocked by the flexible rubber rings 23, the BB bullets or paintballs are not allowed to drop off or separate.

[0013] The storage chamber 3 is delimited by a first raised wall 31 and a second raised wall 32 respectively at front end and rear end thereof and forms an opening 33 in the rear end. Further, pressure relief apertures 34 are respectively formed on sides of the opening 33.

[0014] The actuation rod assembly 4 is received in the central through bore 21 of the bullet compartment 2 and comprises a hollow air inlet tube 41. The air inlet tube 41 forms, at a front end thereof, an air inlet opening 411 in which a check valve is mounted. The air inlet tube is coupled to a first disk 42 and a second disk 43, which are hollow, and an air output opening 44 is formed between the first disk 42 and the second disk 43. The first disk 42 and the second disk 43 each have a circumference around which a gasket ring 421, 431 is mounted and have an end forming a projection 45 to be fit into the opening 33 of the storage chamber for positioning purposes.

[0015] With the above described components being properly assembled, a structure of grenade for toy guns is formed. In a normal condition, the gasket ring 421, 431 on the first disk 42 and the second disk 43 of the actuation rod assembly 4 are in engagement with the first raised wall 31 and the second raised wall 32 of the storage chamber 3 to thereby hermetically seal the storage chamber 3. The compressed air is fed through the air inlet

opening 411 of the air inlet tube 41 of the actuation rod assembly 4 and the compressed air is discharged through the air output opening 44 to accumulate in the storage chamber 3. In percussion, a trigger of a toy grenade launcher is structured to push the actuation rod assembly 4 forward through the opening 33 formed in the rear end of the storage chamber 3 to disengage the first disk 42 from the first raised wall 31 of the storage chamber 3, releasing the compressed air accumulated in the storage chamber 3 to instantaneously eject the BB bullets or paintballs received in the bullet compartment 2.

[0016] Referring to FIGS. 4 and 5, which are respectively a cross-sectional view demonstrating the operations of feeding air and loading BB bullets or paintballs according to the present invention and a side elevational view illustrating an application of the present invention, as shown in these drawings, to use the present invention, compressed air is fed through the air inlet opening 411 on the front end of the air inlet tube 41 of the actuation rod assembly 4 to have the compressed air to discharge through the. Due the check valve mounted inside the air inlet opening 411 and the hermetic engagement of the gasket ring 421, 431 of the first disk 42 and the second disk 43 of the actuation rod assembly 4 with the first raised wall 31 and the second raised wall 32 of the storage chamber 3 respectively, the storage chamber 3 is hermetically sealed and the compressed air is prevented from undesired release. The BB bullets or paintballs 5 are then loaded into the bullet compartment 2 respectively through the front openings of the accommodation cylinders 22. Due to the flexible rubber rings 23 that are provided at the inner side portions of the accommodation cylinders 22, the BB bullets or paintballs 5 must be forced to move through the flexible rubber rings 23 to be put into the accommodation cylinders 22 and due to being blocked by the flexible rubber rings 23, the BB bullets or paintballs 5 are prevented from dropping off or separating. After the operations of feeding air and loading bullets, a number of grenades may then be loaded into a grenade magazine 61 of the toy grenade launcher 6 to be sequentially launched by being fired by the trigger 62 of the grenade launcher 6.

[0017] Referring to FIG 6, which is a cross-sectional view illustrating a percussion operation of the present invention, reference being also made to FIG 5, as shown in these drawings, in the percussion of the present invention, the trigger 62 of the grenade launcher 6 is pulled to cause a pusher bar that is coupled to the trigger 62 to push the actuation rod assembly 4 forward through the opening 33 formed in the rear end of the storage chamber 3 to disengage the gasket ring 421 of the first disk 42 from the first raised wall 31 of the storage chamber 3, forming a gap between the storage chamber 3 and the bullet compartment 2. However, the gasket ring 431 of the second disk 43 is still kept in engagement with the second raised wall 32 of the storage chamber 3, so that compressed air inside the storage chamber 3 is only allowed to release through the gap.

[0018] Referring to FIG 7, which is another cross-sectional view illustrating the percussion operation of the present invention, the drawing shows that when the actuation rod assembly 4 of the present invention is pushed forward and the gasket ring 421 of the first disk 42 is caused to disengage from the first raised wall 31 of the storage chamber 3 to form the gap between the storage chamber 3 and the bullet compartment 2, the compressed air inside the storage chamber 3 cooperates with the pressure relief apertures 34 to instantaneously release through the gap between the storage chamber 3 and the bullet compartment 2 and enter each of the accommodation cylinders 22 of the bullet compartment 2 thereby instantaneously eject the BB bullets or paintballs 5 contained in each accommodation cylinder 22 of the bullet compartment 2 to simultaneously shoot a number of BB bullets or paintballs 5.

[0019] Referring to FIG 8, which is a further cross-sectional view illustrating the percussion operation of the present invention, the drawing shows that when the actuation rod assembly 4 of the present invention is pushed forward and the gasket ring 421 of the first disk 42 is caused to disengage from the first raised wall 31 of the storage chamber 3 to form the gap between the storage chamber 3 and the bullet compartment 2, the compressed air inside the storage chamber 3 cooperates with the pressure relief apertures 34 to instantaneously release through the gap and enter each of the accommodation cylinders 22 of the bullet compartment 2, whereby besides instantaneously ejecting the BB bullets or paintballs 5 contained in each accommodation cylinder 22 of the bullet compartment 2 to simultaneously shoot a number of BB bullets or paintballs 5, the BB bullets or paintballs 5 are also shot together with the front cap 1 so as to provide another way of shooting.

[0020] In summary, the present invention comprises a bullet compartment that forms a plurality of accommodation cylinders to work with a storage chamber that stores compressed air therein and a movable actuation rod assembly to constitute a grenade for toy gun, whereby compressed air is fed into the grenade and stored in the storage chamber to allow the compressed air stored inside the storage chamber to instantaneously eject the BB bullets or paintballs contained in the bullet compartment. The operation is easy and convenient.

[0021] It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

Claims

1. A grenade for toy gun, comprising:

- a front cap (1);
- a bullet compartment (2), which comprises a centrally-formed through bore (21), which has a

circumference around which a plurality of circumferentially arranged accommodation cylinders (22) is arranged to allow each of the accommodation cylinders (22) to receive, via a front opening thereof, and load BB bullets or paintballs (5) therein;

a storage chamber (3), which is in communication with the bullet compartment (2) and is delimited by a first raised wall (31) and a second raised wall (32) respectively at front end and rear end thereof;

an actuation rod assembly (4), which is hollow and is received in the central through bore (21) of the bullet compartment (2) and comprises an air inlet tube (41) arranged at a front side thereof, the air inlet tube (41) having a front end forming an air inlet opening (411) and a rear end to which a first disk (42) and a second disk (43) are mounted, an air output opening (44) being formed between the first disk (42) and the second disk (43), the first disk (42) and the second disk (43) each having a circumference around which a gasket ring (421, 431) is mounted to set the gasket rings (421, 431) in engagement with the first raised wall (31) and the second raised wall (32) of the storage chamber (3) so as to hermetically seal the storage chamber (3), whereby compressed air is allowed to feed through the air inlet opening (411) of the air inlet tube (41) and the compressed air is discharged through the air output opening (44) to accumulate in the storage chamber (3) and whereby the actuation rod assembly (4) is adapted to be pushed forward due to the percussion of a trigger (60) of a toy grenade launcher (6) to disengage the first disk (42) from the first raised wall (31) of the storage chamber (3) so as to release the compressed air in the storage chamber (3) to instantaneously eject the BB bullets or paintballs (5) received in the bullet compartment (2).

2. The grenade according to claim 1, wherein the storage chamber (3) has a rear end forming an opening (33), the actuation rod assembly (4) having a rear end forming a projection (45) that is receivable in the opening (33) of the storage chamber (3) for positioning purposes.

3. The grenade according to claim 2, wherein pressure relief apertures (34) are formed on sides of the opening (33).

4. The grenade according to claim 1, wherein each of the accommodation cylinders (22) of the bullet compartment (2) has an inner side portion which is provided with a flexible rubber ring (23), whereby the BB bullets or paintballs (5) are forcibly movable through the flexible rubber ring (23) to be positioned

into each of the accommodation cylinders (22), the flexible rubber rings (23) blocking and preventing the BB bullets or paintballs (5) from dropping off.

5. The grenade according to claim 1, wherein the air inlet opening (411) formed in the front end of the air inlet tube (41) of the actuation rod assembly (4) is provided with a check valve mounted therein.

Patentansprüche

1. Eine Granate für eine Spielzeugpistole, bestehend aus:

eine vordere Kappe (1);
eine Kugelkammer (2), der eine zentral gebildete Durchgangsbohrung (21) beinhaltet, die einen Kreisumfang hat, um welchen eine Reihe von in Umfangsrichtung angeordneten Magazin-Zylindern (22) angeordnet sind, die alle Magazin-Zylinder (22) über eine vordere Öffnung davon eine Ladung von BB Kugeln oder Paintballs (5) erhalten;
eine Lagerkammer (3), die mit der Kugelkammer (2) verbunden und durch eine erste erhöhte Wand (31) und eine zweite erhöhte Wand (32) am vorderen und hinteren Ende abgrenzt ist:

ein Aktivierungsgestänge (4), die hohl ist und mit der zentralen Durchgangsbohrung (21) der Kugelkammer (2) verbunden ist und ein Lufteinlassrohr (41) enthält, das an dessen Vorderseite angeordnet ist, das Lufteinlassrohr (41) mit einer Vorderende-Formung, eine Lufteinlassöffnung (411) und ein Hinterende auf das eine erste Scheibe (42) und eine zweite Scheibe (43) montiert sind, eine Luftauslassöffnung (44) die zwischen der ersten Scheibe (42) und der zweiten Scheibe (43) angeordnet ist, und die erste Scheibe (42) und die zweite Scheibe (43) mit jeweils einem Kreisumfang rund um welche ein Dichtring (421, 431) montiert ist, um die Dichtringe (421, 431) zusammen mit der ersten angehobenen Wand (31) und den zweiten angehobenen Wand (32) der Lagerkammer (3) einzustellen, damit die Lagerkammer (3) hermetisch verschlossen wird, wodurch die Pressluft durch die Lufteinlassöffnung (411) des Lufteinlassrohrs (41) dosiert werden kann und die Pressluft strömt durch die Luftauslassöffnung (44) aus, damit sie in der Lagerkammer (3) angesammelt werden kann und das Aktivierungsgestänge (4)

um die erste Scheibe (42) - wird so eingestellt, dass sie dem Aufschlag vom Trigger (60) einer Spielzeugpistole (6) entsprechend nach vorn geschoben werden kann - der ersten angehobenen Wand (31) der Lagerkammer (3) auszulösen so dass die Pressluft in der Lagerkammer (3) die BB Kugeln oder Paintballs (5) in der Kugelkammer (2) sofort auswerfen kann.

2. Die Granate nach Anspruch 1, wobei die Lagerkammer (3) über eine Öffnung (33) am hinteren Ende verfügt, das Aktivierungsgestänge (4) mit einer Hinterende-Formung eine Ausbuchtung (45) die mit der Öffnung (33) der Lagerkammer (3) für die Positionierung verbunden ist.
3. Die Granate nach Anspruch 2, die Druckentlastungsöffnungen (34), welche auf beiden Seiten der Öffnung (33) angeordnet sind.
4. Die Granate nach Anspruch 1, wobei alle Magazin-Zylinder (22) der Kugelkammer (2) eine innere Seite haben, die mit einem flexiblen Gummiring (23) versehen sind, wonach die BB Kugeln oder Paintballs (5) durch den flexiblen Gummiring (23) bewegt werden können um in jeden Magazin-Zylinder (22) positioniert zu werden, der flexible Gummiring (23) der die BB Kugeln oder Paintballs (5) blockiert und damit verhindert, dass diese herunterfallen.
5. Die Granate nach Anspruch 1, wobei die Lufteinlassöffnung (411) am vorderen Ende des Saugrohrs (41) des Aktivierungsgestänges (4) mit einem Rückschlagventil montiert ist.

Revendications

1. Une structure de grenade pour pistolet jouet, comprenant :

Une capsule-amorce (1) ;
Un compartiment pour les balles (2), qui comporte un trou de passage central (21) possédant une circonférence autour de laquelle une pluralité de cylindres est disposée de façon circonférentielle (22) pour permettre à chaque cylindre du barillet (22) de recevoir, par le biais d'une ouverture frontale de ceux-ci, et de charger des balles BB ou de paintball (5) à l'intérieur ;
Une chambre de stockage (3), qui est en communication avec le compartiment des balles (2) et est délimitée par une première cloison (31) et une seconde cloison (32) situées respectivement à l'avant et à l'arrière de celle-ci ;
Un ensemble de tige d'actionnement (4), qui est creuse et est reçue dans le trou de passage (21)

- du compartiment des balles (2) et comporte un tube d'arrivée d'air (41) situé sur l'avant de celui-ci, et dont l'extrémité avant possède une ouverture d'arrivée d'air (41) tandis qu'un premier (42) et un second (43) disque sont montés sur son extrémité arrière ; une sortie d'air (44) se forme entre le premier (42) et le second (43) disque ; le premier (42) et le second (43) disque possèdent chacun une circonférence autour de laquelle une bague d'étanchéité (421, 431) est montée ; ces bagues d'étanchéité (421, 431) sont montées contre la première (31) et la seconde (32) cloison de la chambre de stockage (3) afin de la sceller hermétiquement, moyennant quoi de l'air comprimé peut passer par l'ouverture d'arrivée d'air (411) du tube d'arrivée d'air (41) et cet air comprimé est évacué par l'ouverture de sortie d'air (44) pour s'accumuler dans la chambre de stockage (3) moyennant quoi l'ensemble de tige d'actionnement (4) est adapté pour être propulsé vers l'avant grâce à la percussion de la gâchette (60) d'un lance-grenade jouet (6) pour désengager le premier disque (42) de la première cloison (31) de la chambre de stockage (3) afin de libérer l'air comprimé dans la chambre de stockage (3) et éjecter instantanément les balles BB ou de paintball (5) reçues dans le compartiment des balles (2).
2. La structure de grenade selon la revendication 1, où la chambre de stockage (3) possède une extrémité arrière formant une ouverture (33), l'ensemble de tige d'actionnement (4) a une extrémité arrière qui forme une projection (45) adaptable à l'ouverture (33) de la chambre de stockage (3), dans un but de positionnement.
3. La structure de grenade selon la revendication 2, où des événements pour libérer la pression (34) sont situés sur les côtés de l'ouverture (33).
4. La structure de grenade selon la revendication 1, où chacun des cylindres (22) du compartiment de balles (2) possède une portion interne comprenant un anneau de caoutchouc flexible (23), moyennant quoi les balles BB ou de paintball (5) peuvent être déplacées en force au travers de cet anneau (23) pour être mises en position dans chacun des cylindres du barillet (22), ces anneaux en caoutchouc flexible (23) bloquant les balles BB ou de paintball (5) et les empêchant de tomber.
5. La structure de grenade selon la revendication 1, où l'ouverture d'arrivée d'air (411) située sur l'avant du tube d'arrivée d'air (41) de l'ensemble de tige d'actionnement est équipée d'un clapet anti-retour en son intérieur.

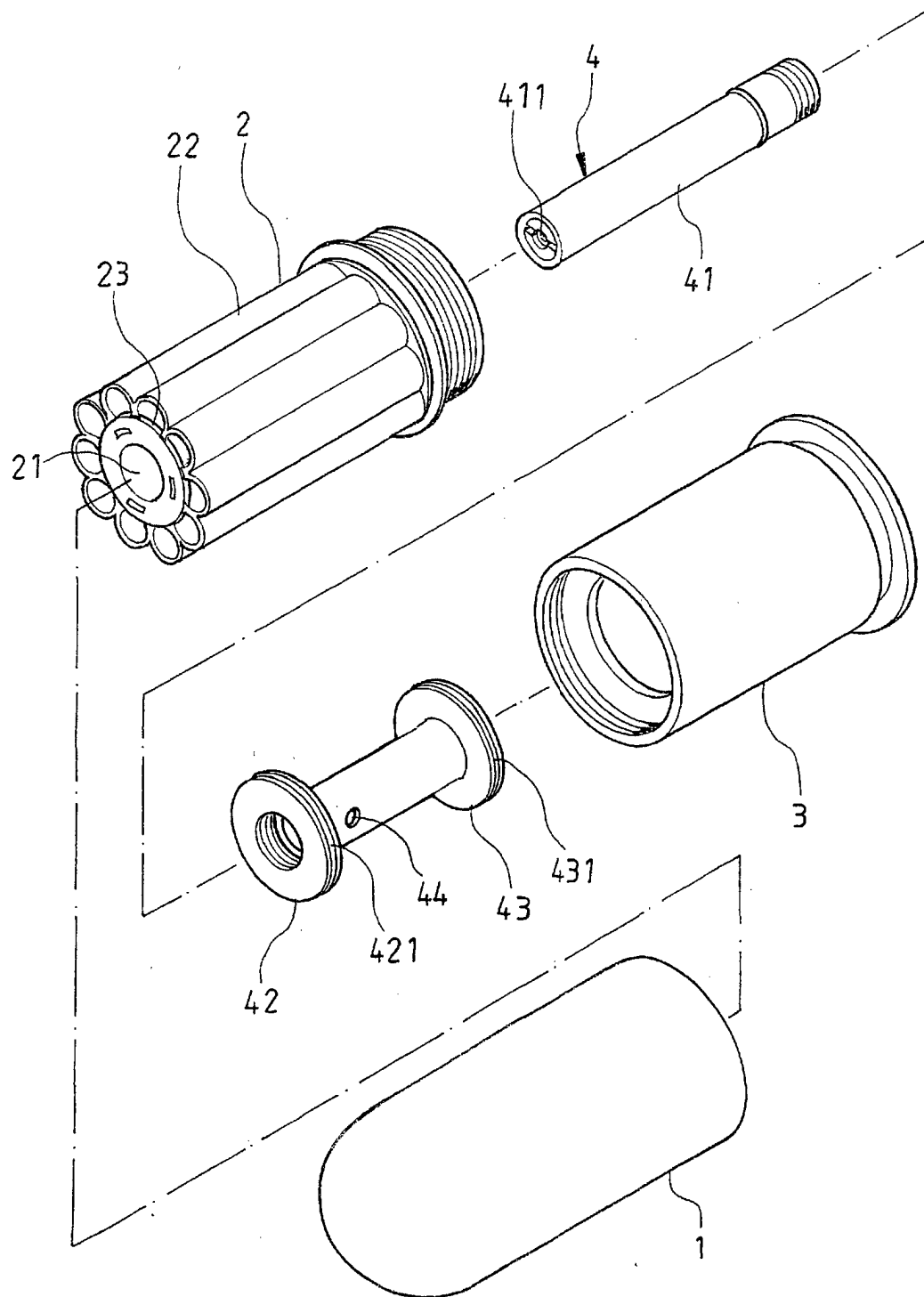


FIG.1

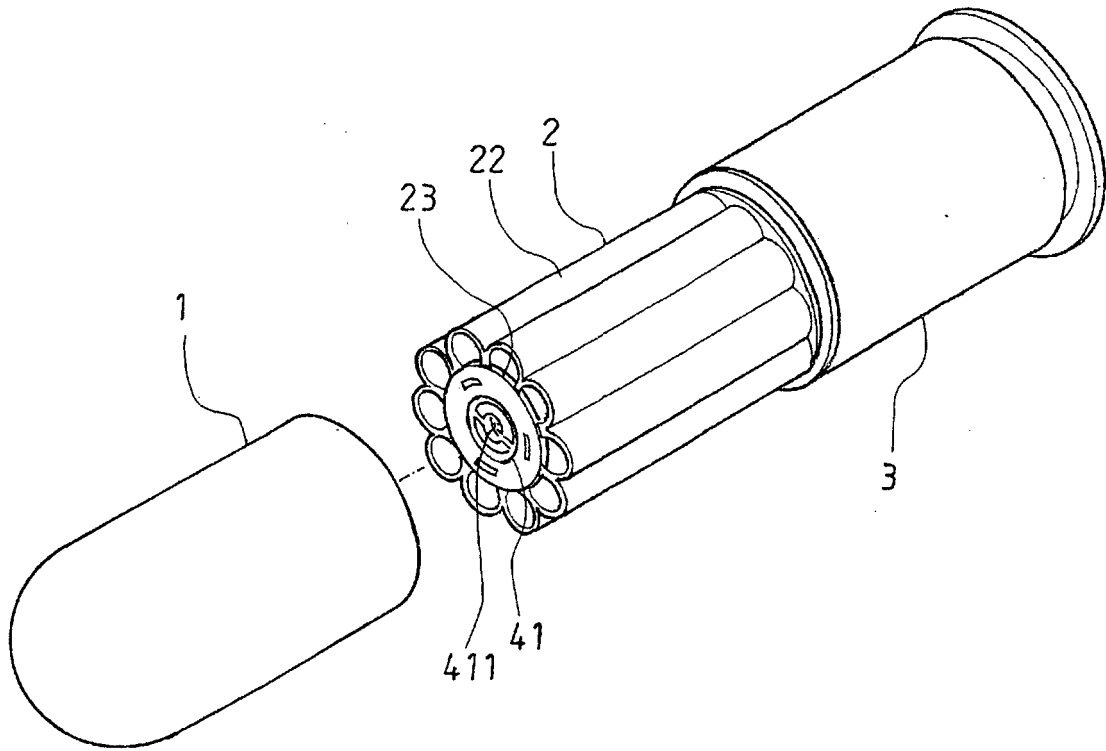


FIG.2

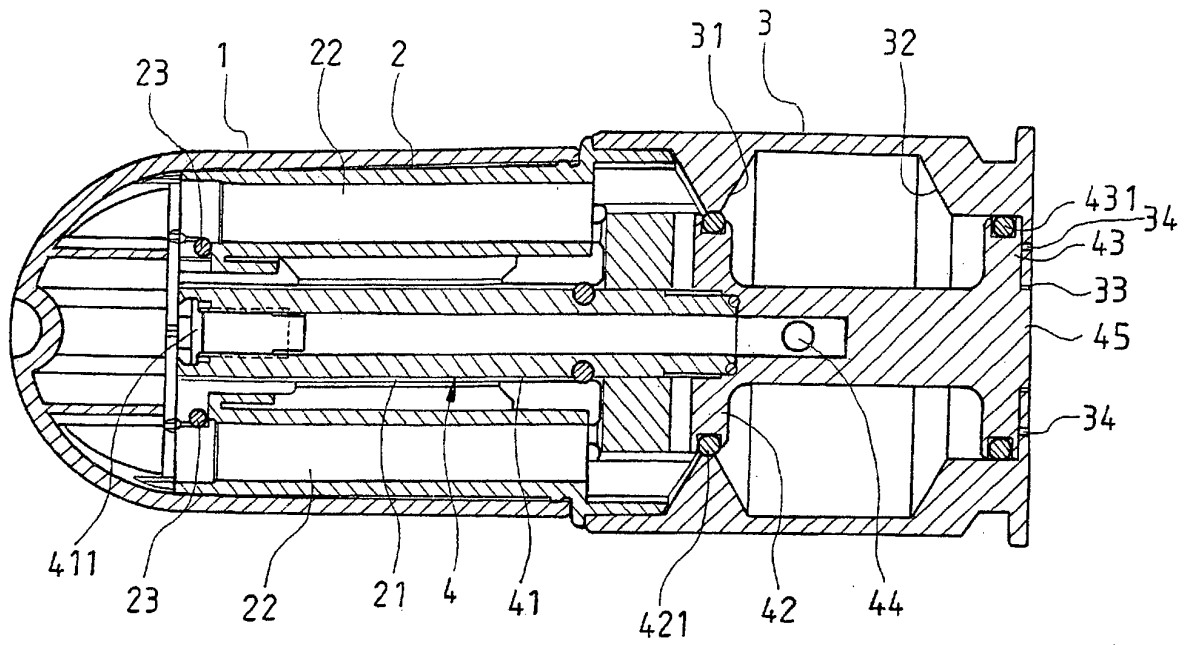


FIG.3

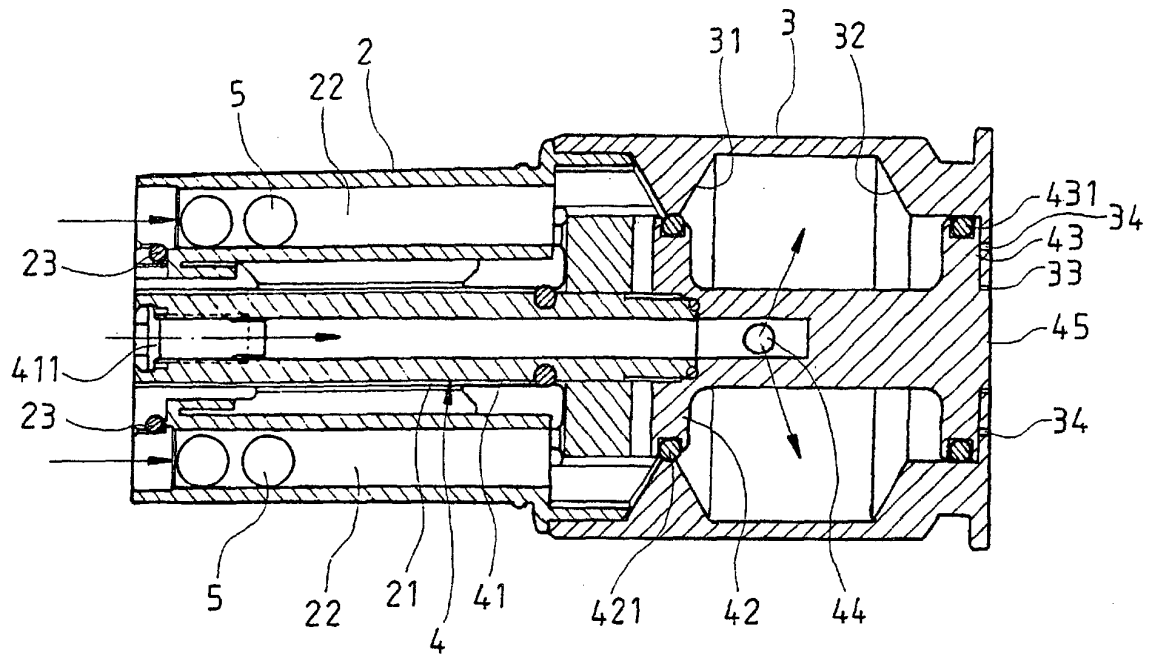


FIG.4

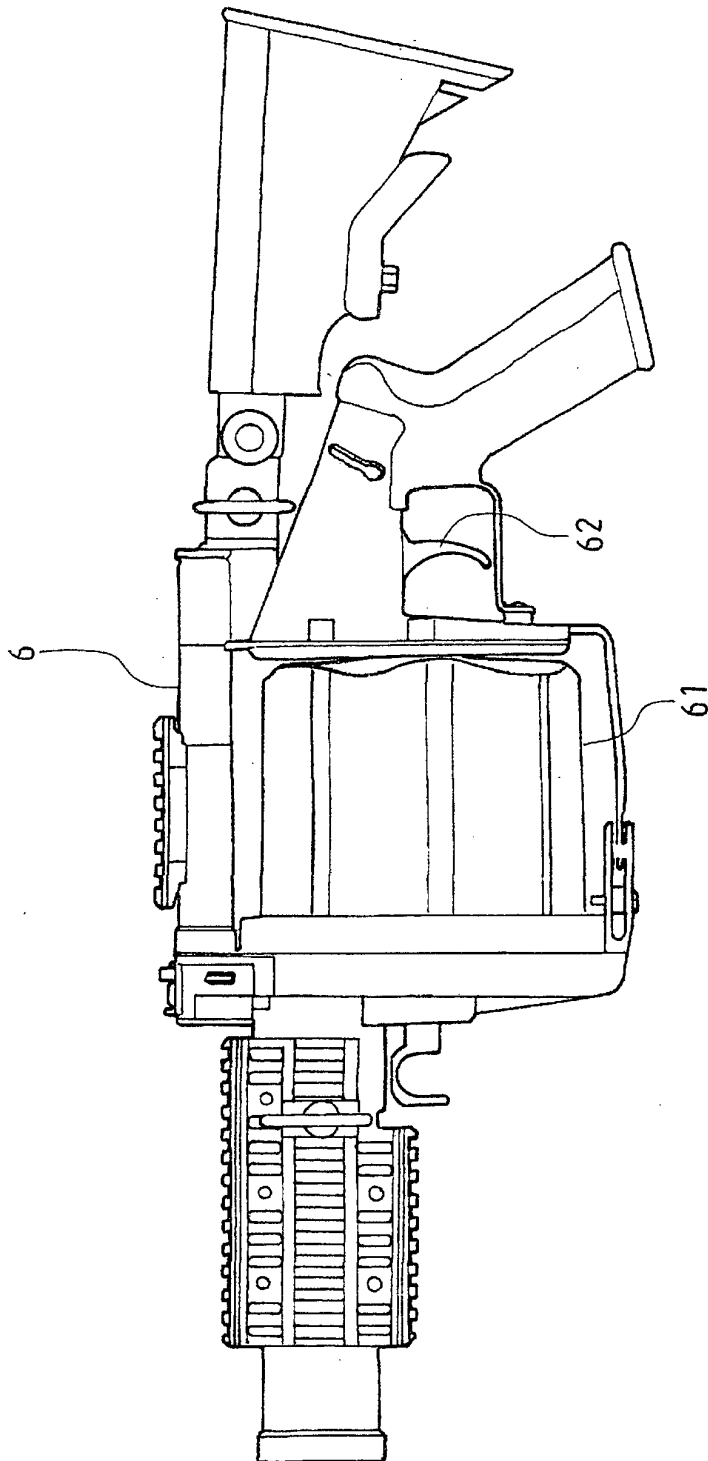


FIG. 5

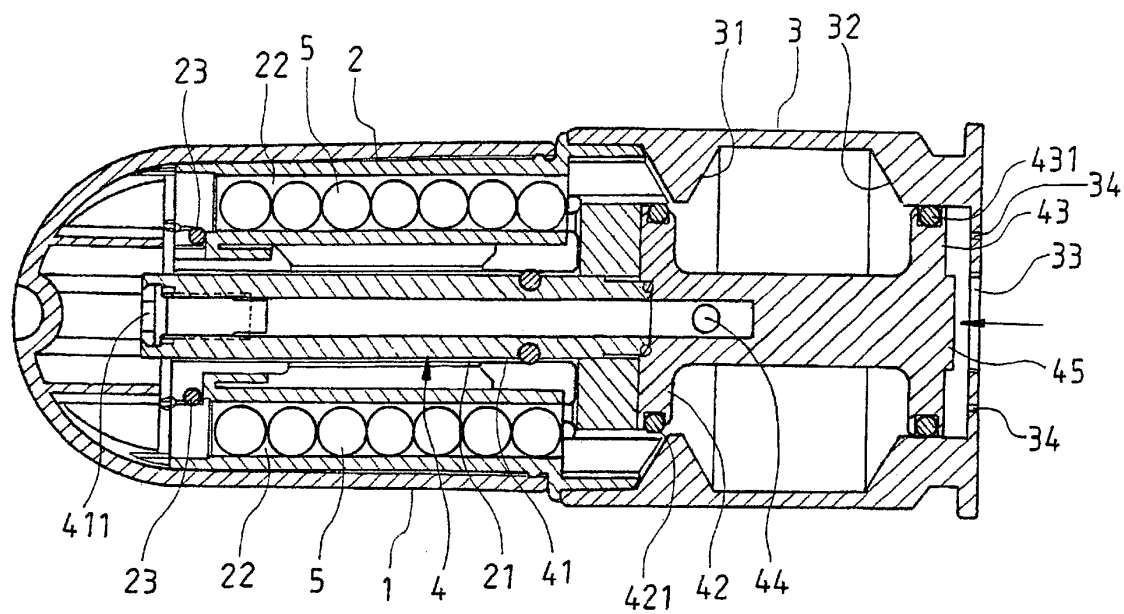


FIG.6

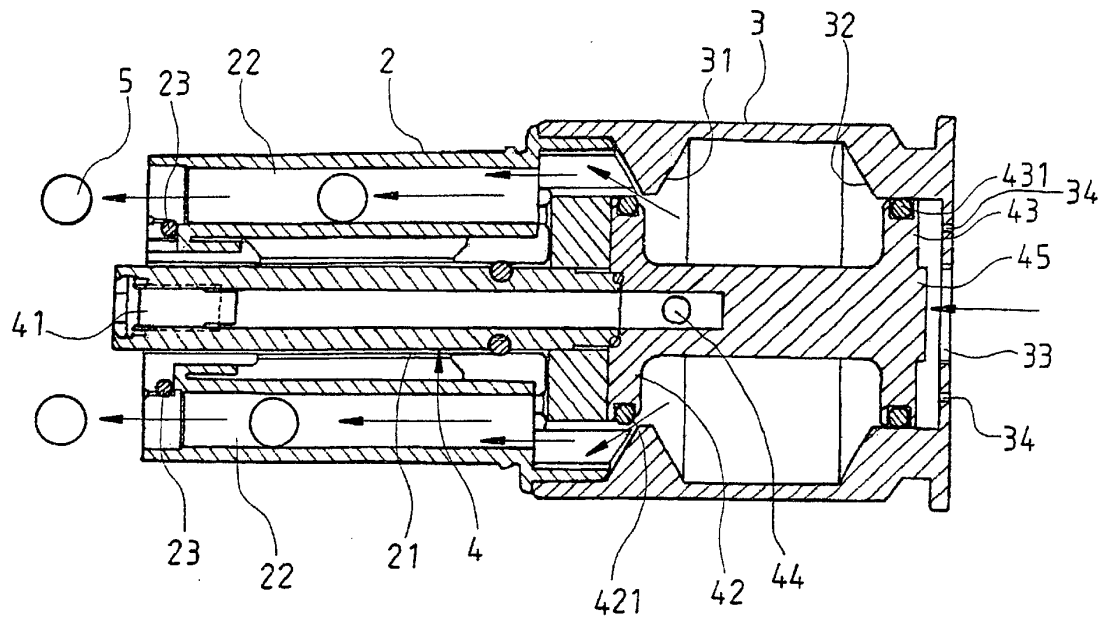


FIG.7

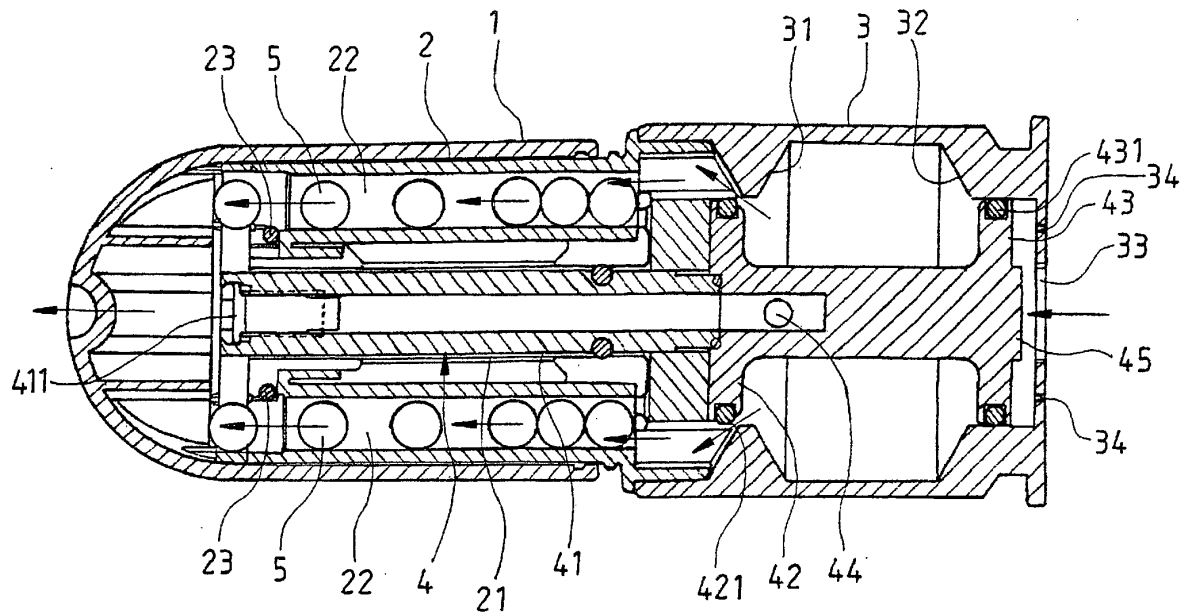


FIG.8

REFERENCES CITED IN THE DESCRIPTION

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