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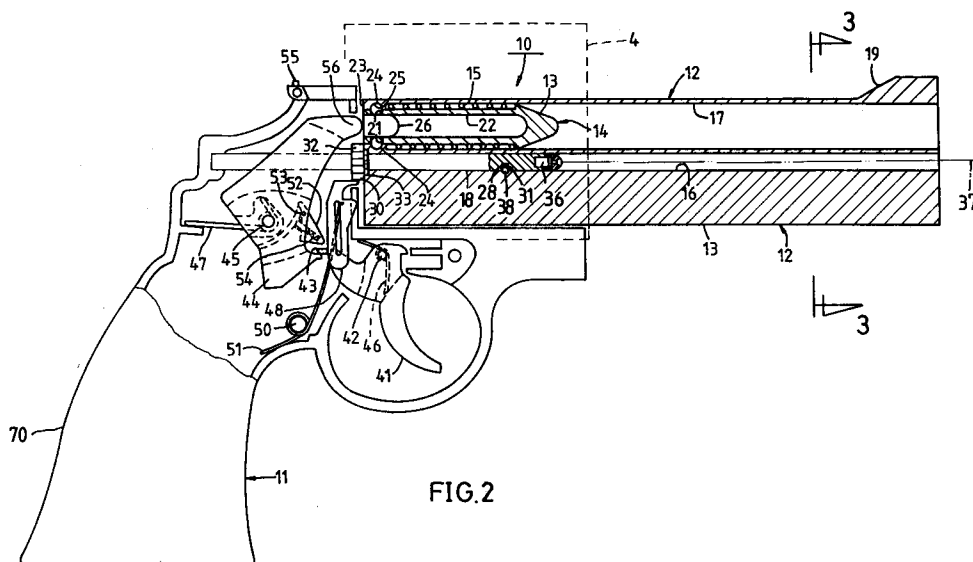
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F41G 1/35, F41G 1/02**(22) Date of filing: **24.03.93**(43) Date of publication of application:
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D-80538 München (DE)(54) **Revolver type spring gun.**

(57) A multi-cartridge shooting gun device includes a magazine (12) with a central hole (16) engaging a supporting shaft (18) extending from a gun housing (11). The magazine has a plurality of magazine holds (17) disposed around the axis, each for receiving a cartridge (14). A spring (15) is disposed in each

cartridge hole (17) for being compressed between the magazine (12) and the respective cartridge (14). When a cartridge (14) is actuated by a trigger (41) the resilience of the spring (15) will assist shooting the cartridge (14) towards the target.

**EP 0 618 421 A1**

TECHNICAL FIELD

The invention relates generally to gun device, and, more specifically, to gun device having a removable magazine that stored multiple pressed springs and cartridges to shoot out a cartridge by means of the kinetic energy of the pressed spring each time.

BACKGROUND ART

A fishing gun is widely popular to most of diving lovers who usually have brought one during diving in the sea so as to protect themselves against the risk of being attacked by fish. The fishing gun of this sort has to reload a fish dart and push the chamber again for next shooting whenever a fish dart is being shot out. However in case of facing attack by sharks related protection should be carried out as fast as better and it would be even better if continuous shooting function permitted in order to continue to shoot once the first shoot had missed. But the traditional fishing gun fails to meet such kind of need.

In addition all gas toy guns available on the market are using FLON 12 as kinetic energy for shooting plastic ball cartridges. The defect lies in that they need to be refilled gas very often so that they can not be operated in facility.

Therefore either a fishing gun or gas toy gun for shooting a fishing dart/plastic ball cartridge all kinetic energy it depends is from gun housing rather than cartridge itself that's why each has individual defect as mentioned above.

SUMMARY OF THE INVENTION

The multi-cartridge shooting gun device of the present invention includes a housing; a trigger pivotably mounted in the housing; a hammer member pivotably mounted in the housing and operatively connected with the hammer member; and a swivel member operatively connected with the trigger.

It is characterized in by that:

The multi-cartridge shooting gun device further includes:

- (a) a supporting shaft, wherein one end of the supporting shaft is rotatably mounted in the gun housing and the other end is stretching over the gun housing and exposed to the gun housing, the supporting shaft driven by the driving member for revolving at intervals; and
- (b) a magazine, which includes: a cylinder, which have an engaging hole for casing around the outer rim of the supporting shaft, and have multiple magazine holes circulating around the axial center of the engaging hole and in parallel

to the axial center; and multiple cartridges respectively mounted in the magazine holes; and multiple springs, which are respectively mounted in the magazine holes, one end of the spring is acted against the cartridge and the other end is acted against the cylinder, the spring is compressed by the cartridge and cylinder.

The magazine further includes:

- (a) a steel ball, which is partially stretched into the cylinder while remaining part stretching into the cartridge for retaining it at a firing position in the magazine hole readily for being shot out; and
- (b) an end plug member, which is inserted in the magazine hole to enable the steel ball to maintain partially stretching into the cartridge while remaining part stretching into the position of the cylinder.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of the present invention, showing the cylinder;

FIG. 2 is a broken sectional view of the present invention,

FIG. 3 is a cross sectional view taken along the line 3-3 of FIG. 2,

FIG. 4 is an enlarge view taken from the area 4 of FIG. 2,

FIG. 5 is a cross sectional view taken from the line 5-5 of FIG. 4,

FIG. 6 is an enlarge broken view of another embodiment of the cartridge of the present invention, and

FIG. 7 is the cartridge of FIG. 6, showing the nose of the cartridge having pierced into the body of target shot.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 2, the multi-cartridge shooting gun device 10 of the present invention comprises a gun housing 11 and magazine 12. The present invention is characterized in mostly by the magazine 12 and slightly by the gun housing 11.

Referring to FIGS. 1 and 2, the magazine 12 includes a cylinder 13, multiple cartridges 14 and multiple springs 15 wherein the center of the cylinder 13 having an engaging hole 16 and a plural magazine holes 17 mounted around the engaging hole 16 wherein the engaging hole 16 provided for fitting together the supporting shaft 18 of the gun housing 11. The magazine holes 17 are provided for loading the springs 15 and cartridges 14. The leading end of the cylinder 13 has a plural (five in the embodiment) front sights 19 respectively in align with each of corresponding five magazine

holes 17 - i.e. each magazine hole 17 is align with an individual front sight 19.

Referring to FIGS. 1 and 2, each cartridge 14 has a cartridge member 68 and the leading end of the cartridge member 68 has a flange 20. The rear end of each cartridge 14 has three (or more) lock hole 21 and one center hole 22. Each spring 15 is cased around the cartridge 14. The leading end of each spring 15 is acting against the flange 20 of the cartridge member 68 while rear end acting against the flange 23 at the rear end of the magazine hole 17. The cartridge member 68 is retained at the rear end of the magazine hole 17 by means of three (or more) steel balls 24. Half of each steel ball 24 is pinned in the lock hole 25 on the flange 23 of the magazine hole 17 while the other half is pinned in the lock hole 21 at the rear end of the cartridge member 68. One half of each steel ball 24 is secured in the lock hole 25 of the magazine hole 17 and other half secured in the lock hole 21 of the cartridge member 68, with an end plug member 26 tightly inserted in the center hole 22 of the cartridge member 68, so as to secure the cartridge 14 at the final end of the magazine hole 17. Because each spring 15 is compressed between the flange 20 of the cartridge member 68 and the flange 23 of the magazine hole 17 all the necessary kinetic energy for pushing the cartridge 14 is provided by resiliency stored within each spring. When the end plug member 26 is pushed away, with resilience of each spring, each cartridge 14 is forcibly moving forward to enable each steel ball 24 to depart from the lock holes 21 and 25 so that each cartridge 14 can be smoothly shot along each magazine hole 17.

Referring to FIGS. 1, 2 and 5, there is an radial hole 31 in the supporting shaft 18, and the hole 31 accomodates a spring 28 and a steel ball 29. Over a half of the steel ball 29 is mounted in the hole 31 while the rest exposes to the hole 31 and projects over the outer rim of the supporting shaft 18. There are five lock holes 38 in the engaging hole 16 of the magazine 12. The leading end of the supporting shaft 18 has an axial hole 35 and a laser-beam sight 36 is mounted in the hole 35 which can project laser beam 37 for aiming the target in facility. There is a cell (not shown) mounted in the laser-beam sight 36 as power source for laser beam projected.

A trigger 41 is pivotably mounted on the gun housing 11 by means of a pivot 42 and a trigger portion 43 mounted at its final end can push a hammer member 44 for shooting cartridges. A spring 46 is mounted at the pivot 42 to enable the trigger 41 to return in position. The hammer member 44 is pivotably mounted on the gun housing 11 by means of a pivot 45 and a spring 47 is mounted on the pivot 45 to enable the hammer member 44

ton return in position. By virtue of a push member 48 the trigger 41 can lead the ratchet 30 on the supporting shaft 18 in action so that the supporting shaft 18 may drive the magazine 12 revolve at one interval (i.e. revolving $360^\circ \div 5 = 72^\circ$ or $360^\circ \div 6 = 60^\circ$ if divided into 6 intervals) by means of its driving key 33 and key way 34. A spring 51 pivotably mounted on a secure post 50 is acting against the driving member 48 to enable it in contact with the ratchet 30. A ratchet member 52 is pivotably mounted on the trigger member 44 by means of a pivot 53. One end of a screw spring 54 is acting against the ratchet member 52 and the other end acting against the trigger member 44 to allow the trigger portion 43 of the trigger 41 to push the ratchet member 52 in operation. Upon completion of triggering the trigger portion 43 can slide over the ratchet member 52 and return to the position before triggering.

For operation the user may hold the handle 70 with right hand and hold the magazine 12 with left hand for fitting the engaging hole 16 of the magazine 12 into the supporting shaft 18 and push it at most to enable the lock hole 38 of the the cylinder 13 to engaged with the steel ball 29 outside the supporting shaft 18 and make ready for shooting.

For shooting it may aim at the target by means of laser beam 37 projected from the laser-beam sight 36 against the target for aiming or by means of the rear sight 55 on the gun housing 11 and the front sight 19 on the cylinder 13.

When the trigger 41 is being actuated by the user the trigger portion 43 of the trigger 41 will push the ratchet member 52 of the hammer member 44 counter-clockwise revolving around the pivot 45 to compress the spring 47. On the moment that the trigger portion 43 of the trigger 41 is sliding over the ratchet member 52 the hammer member 44 is thus released and the spring 47 having stored kinetic energy will push the hammer member 44 revolve clockwise; the hammer portion 56 of the hammer member 44 will forcibly hammer the end plug member 26 at the rear end of the cartridge 14. Once being hammered the end plug member 26 moves forward and the steel ball 24 will drop internally or if fails to drop it will be extruded with push force from the spring 15 so that the cartridge 14 is ejected by the spring 15 along the ejector tube formed by the magazine hole 17 flying against the target. During the process of the trigger 41 being actuated the trigger 41 will also drive the driving member 48 pushing the ratchet 30 to enable the supporting shaft 18 to revolve at one interval (i.e. 72°) while the supporting shaft 18 will enable the magazine to revolve at one interval simultaneously by means of its driving key 33 through the key way 34 of the cylinder 13. To allow the supporting shaft 18 and magazine 12 to return

in position after revolving at an interval, as shown on FIGs. 4 and 5 the cartridge for shooting shall maintain above the gun housing for aiming in facility by means of the steel ball 29 on the supporting shaft 18 engaging with one of five lock holes 38 in the cylinder 13.

When all cartridges 14 are being shot the user shall remove the magazine 12 from the supporting shaft 18 and replace a new magazine to shoot continuously.

Referring to FIG. 6 it is another embodiment of a cartridge 14a, which have a cartridge member 69 and the leading end of the cartridge member 68 has a flange 20a and rear end has three (or more) lock holes 21a and a center hole 22a. The spring 15a is cased around the cartridge member 69. The leading end of the spring 15a is acting against the flange 20a of the cartridge member 69 while the rear end is acting against the flange 23a at the rear end of the magazine hole 17a. A half of one of three (or more) steel balls 24a is set into the lock hole 25a on the flange 23a of the magazine hole 17a while the other half of the steel ball 24a is set into the lock hole 21a at the rear end of the cartridge member 69. Meanwhile an end plug member 26a is being tightly inserted in the center hole 22a of the cartridge member 69 so that one half of the steel ball 24a is being secured in the lock hole 25a of the magazine hole 17a and the other half of the steel ball 24a is being secured in the lock hole 21a of the cartridge member 69 to secure the cartridge 14a to the final end of the magazine hole 17a. All the structure described is fully identical to the structure shown on FIG. 4. The differences will be described below. The leading end of the cartridge member 69 has a circular pit 61 and a top post 62 is mounted in the circular pit 61. A needle 63 is engaged in the circular pit 61 and is telescopic axially. The needle 63 is loaded with anesthetic solution and a piston 64 is mounted in the needle 63. One end of the piston 64 is in contact with the top post 62. A rubber guard 65 is covered onto the outer rim of the needle 63 for covering the plunger 66 of the needle 63 so that anesthetic solution is being sealed in the needle 63.

When the cartridge 14a has hit the target at first the plunger 66 will pierce the rubber guard 65 and plunge into the muscle of the target. When the cartridge 14a has hit the target the target will give a large amount of counter action force against the guard 65 and the needle 63 and such counter action force will cause a relatively shrinking action to occur between the needle 63 and the cartridge 14a so that anesthetic solution in the needle 63 will be compressed and injected from the plunger 66 into the target so that the target will be anesthetized to lose resistance within a short time.

Further because of the counter action force the guard 65 will be squeezed backward to form a hypothesis line 65' as shown on FIG. 7. After anesthetic solution extruded from the needle 63 into the target the guard 65 will be squeezed to get deformed and resilient energy stored will restore the guard 65 to its original shape for pulling the needle 66 out of the target so that the cartridge 14a and the needle 66 will remove from the target.

The present invention is mainly characterized in by that, necessary energy for shooting the cartridge is stored in each cartridge in form of resilient energy so that continuous shooting is permitted without gas or powder.

The present invention is further characterized in by that, the magazine can be replaced in facility so that it is suitable for fast and continuous shooting.

The present invention may change the type of cartridge to fit the use of a toy gun in substitute of the plastic ball cartridges, or it can be designed into a wide variety of anesthetic guns to allow divers to defense against attack by sharks or to allow other people to use it as a self-defense tool. Also it is applicable for policemen or security guards to use it for controlling the gangsters without getting them injured.

Claims

1. A multi-cartridge shooting gun device, comprising
 - a gun housing (11),
 - a trigger (41) mounted on the housing (11),
 - a hammer member (44) movably mounted in the housing (11) for actuation by the trigger (41), and
 - a driving member (48) slidably mounted in the housing (11) for operation by the trigger (41),
 characterised by
 - a supporting shaft (11) extending from the housing with one end rotatably mounted in the housing for being indexed by said driving member (48), and
 - a magazine (12) including
 - a cylinder (13) having a central hole (16) engaging the supporting shaft (18) and a plurality of parallel magazine holes (17) spaced around the axis each for receiving a cartridge (17), and
 - a plurality of springs (15) one mounted in each magazine hole (17), one end of each spring acting against the respective cartridge (14) and the other end acting against the cylinder (13) for being compressed by said cartridge and cylinder.

2. The device of claim 1, wherein said magazine (12) further includes a steel ball (24) associated with each magazine hole (17) and an end plug member (26) inserted in each magazine hole (17) for retaining the steel ball (24) in a position in which it partly extends into the cylinder (13) and partly into the respective cartridge (14), so as to retain the cartridge (14) in a ready shooting position.
3. The device of claim 1 or 2, wherein a plurality of aiming sights (19) are provided on the outer rim of the cylinder (13).
4. The device of any of claims 1 to 3, further including a laser-beam sight (36) mounted in said supporting shaft (18) for aiming by laser beam.
5. The device of any of claims 1 to 4, further including
- a cartridge member (69),
 - a needle (63) slidably engaging one end of the cartridge member (69), with a variable loading chamber formed between the needle (63) and the cartridge member (69), the needle (63) having an injection plunger (66) in communication with the loading chamber and being provided with an injection port, and
 - a rubber guard (65) covering the outer periphery of the needle (63) and sealing the injection port of the plunger (63).

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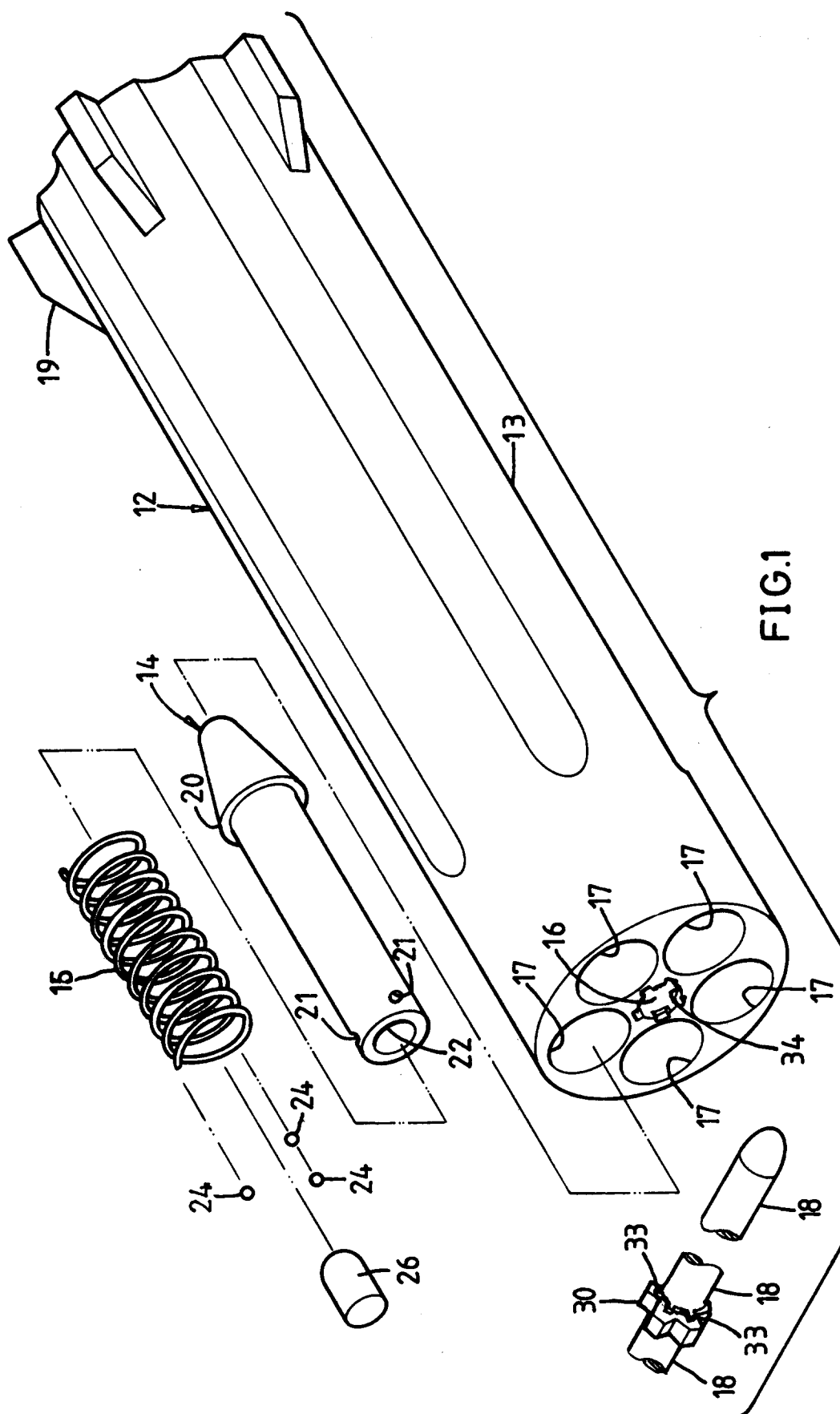
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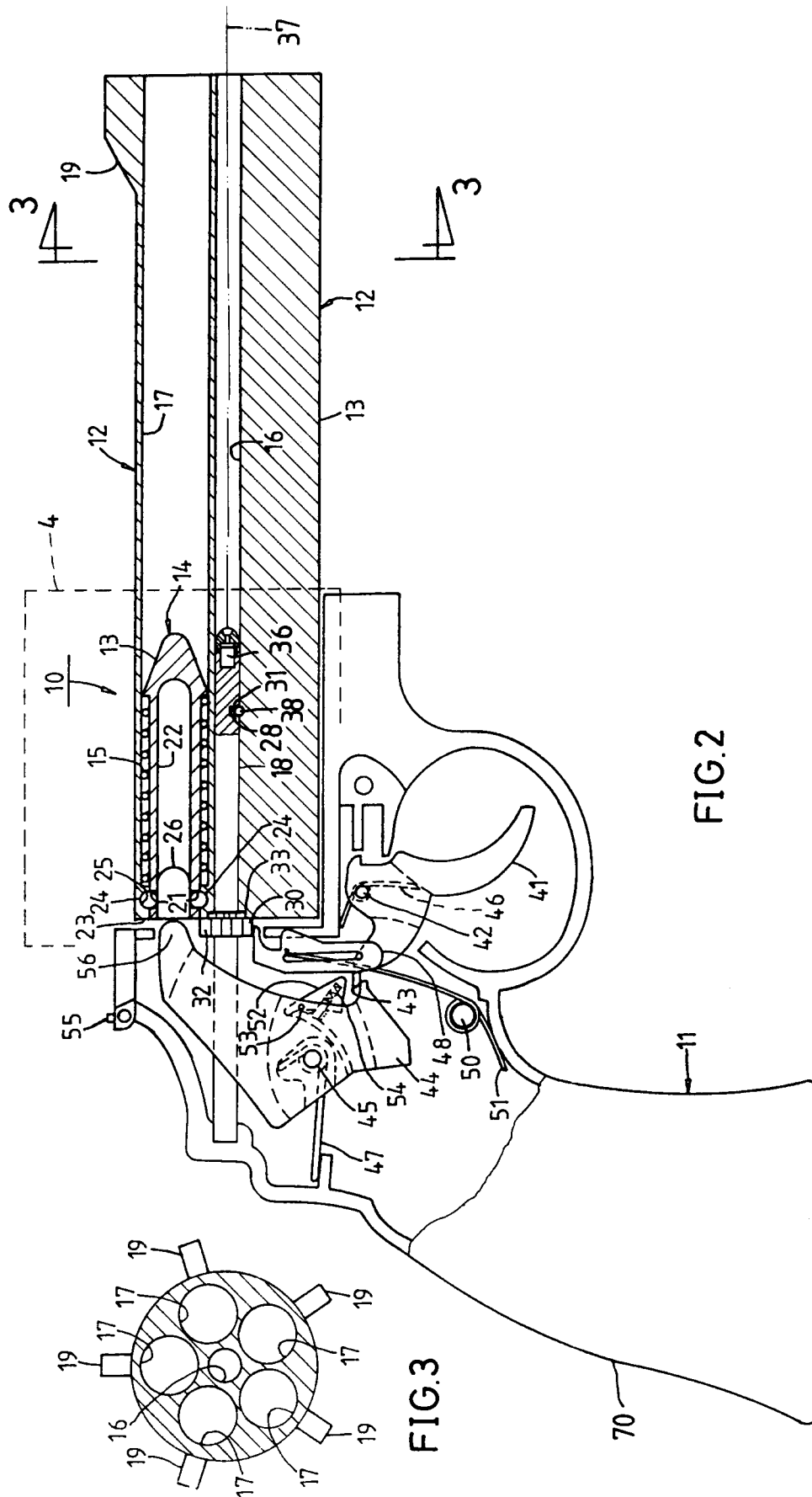
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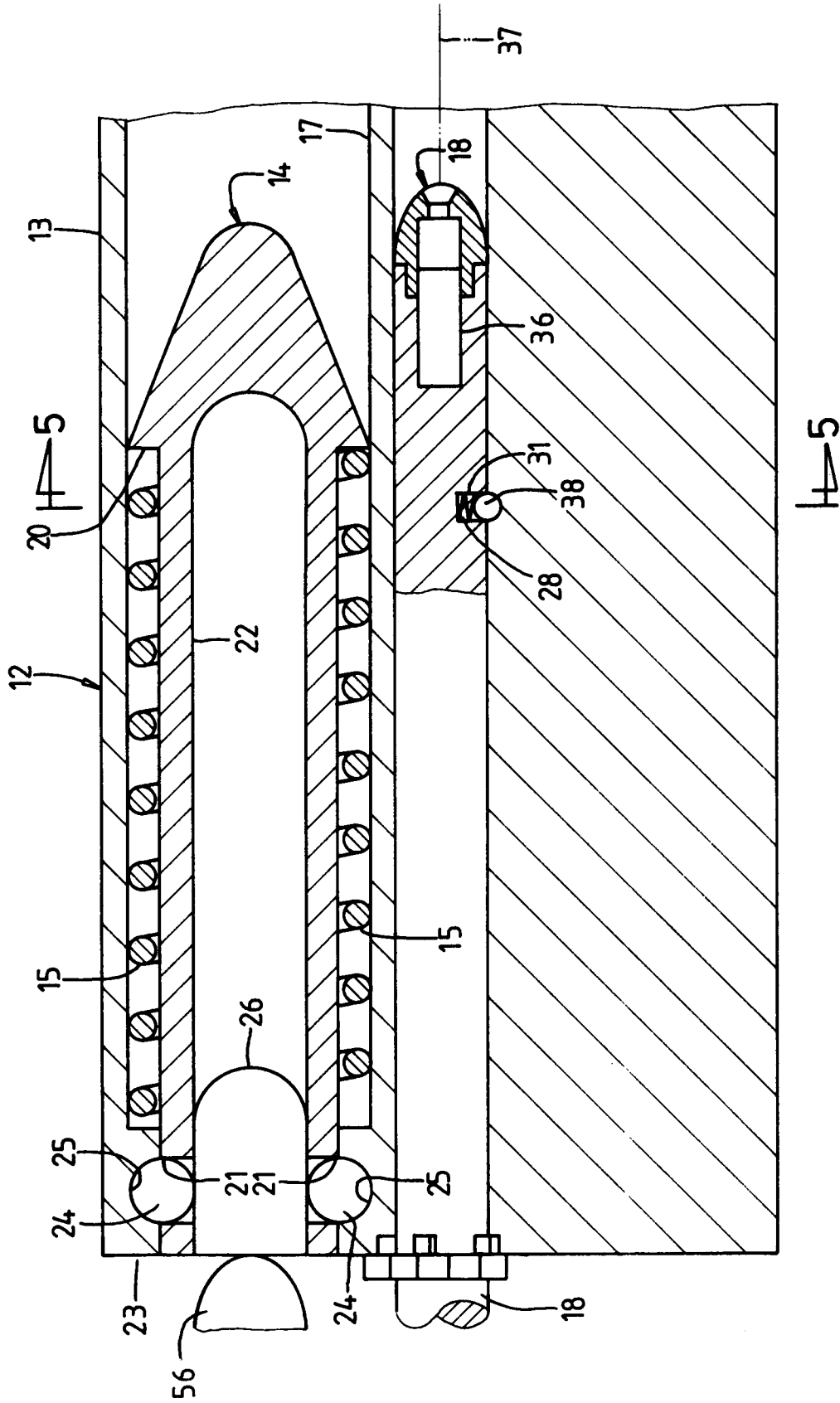


FIG.4

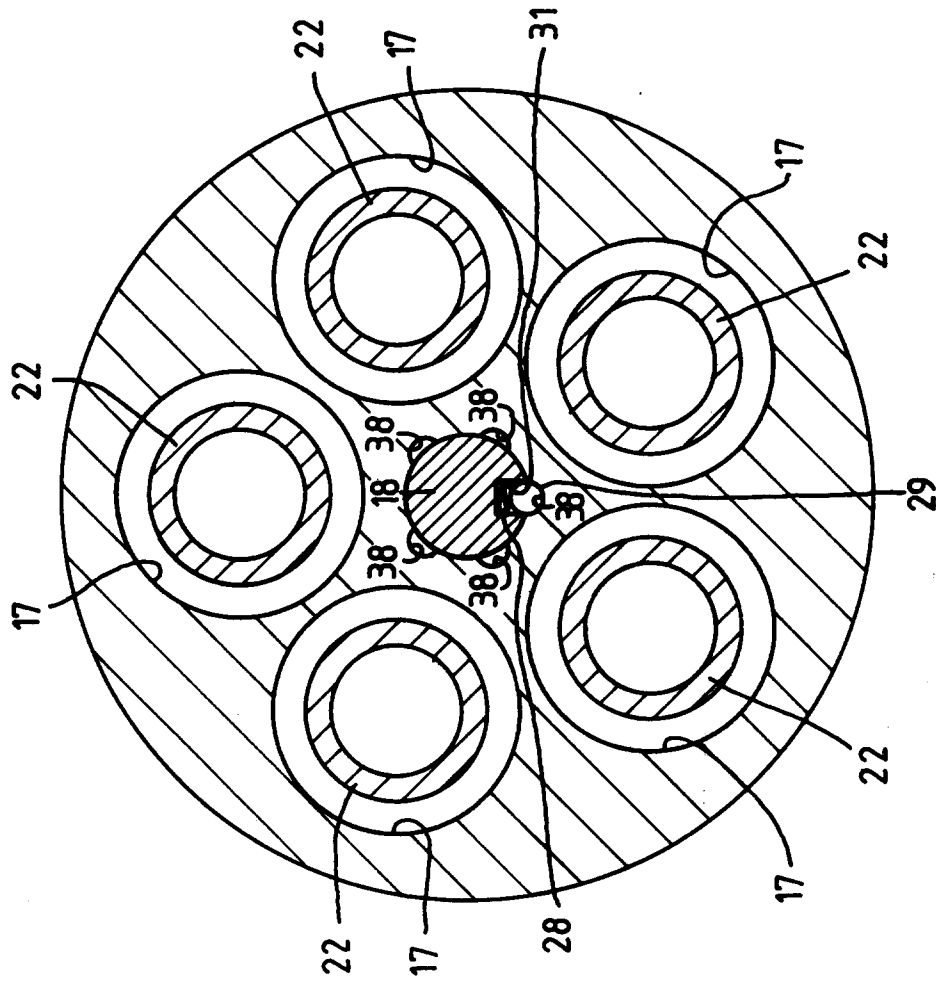


FIG. 5

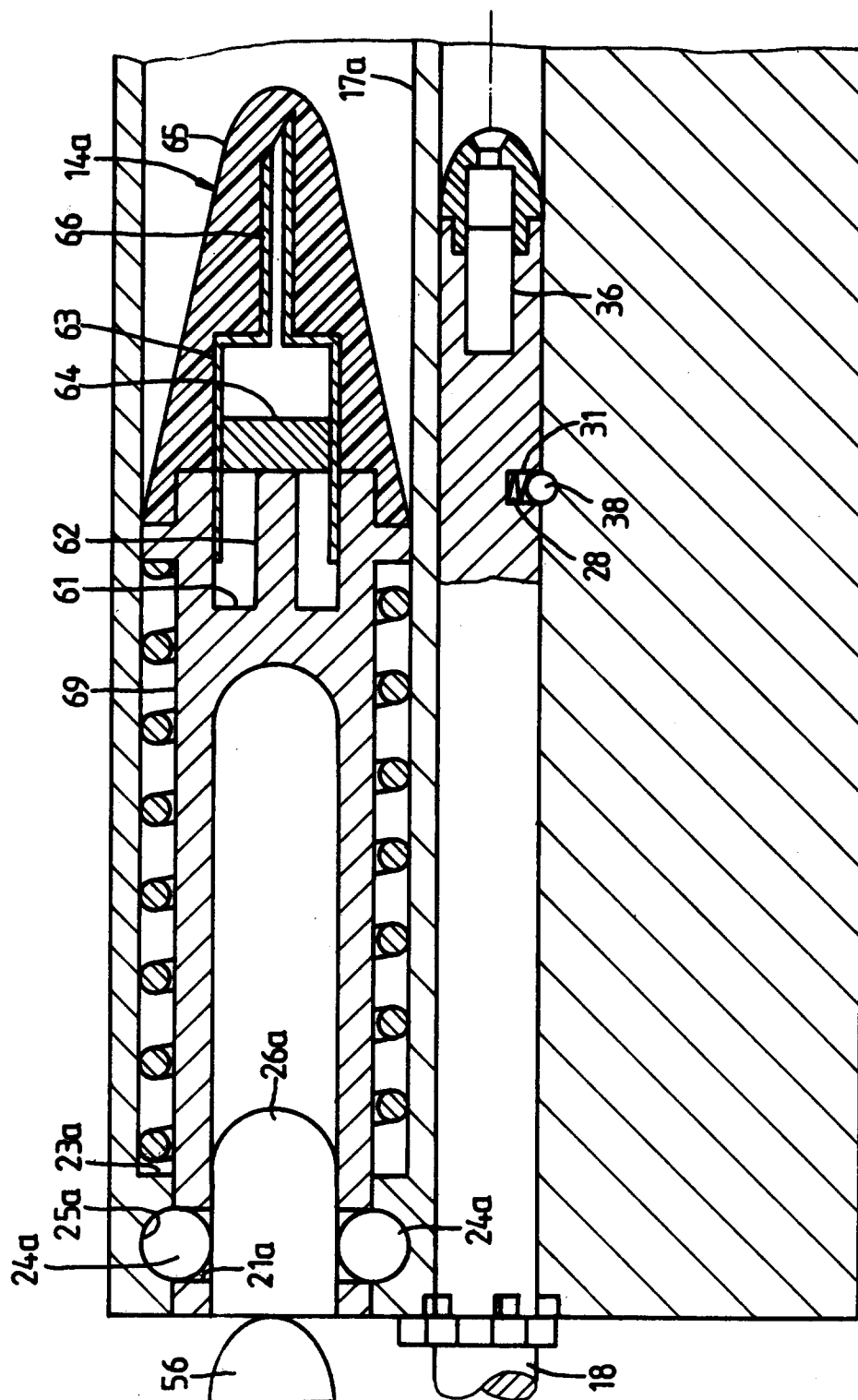


FIG. 6

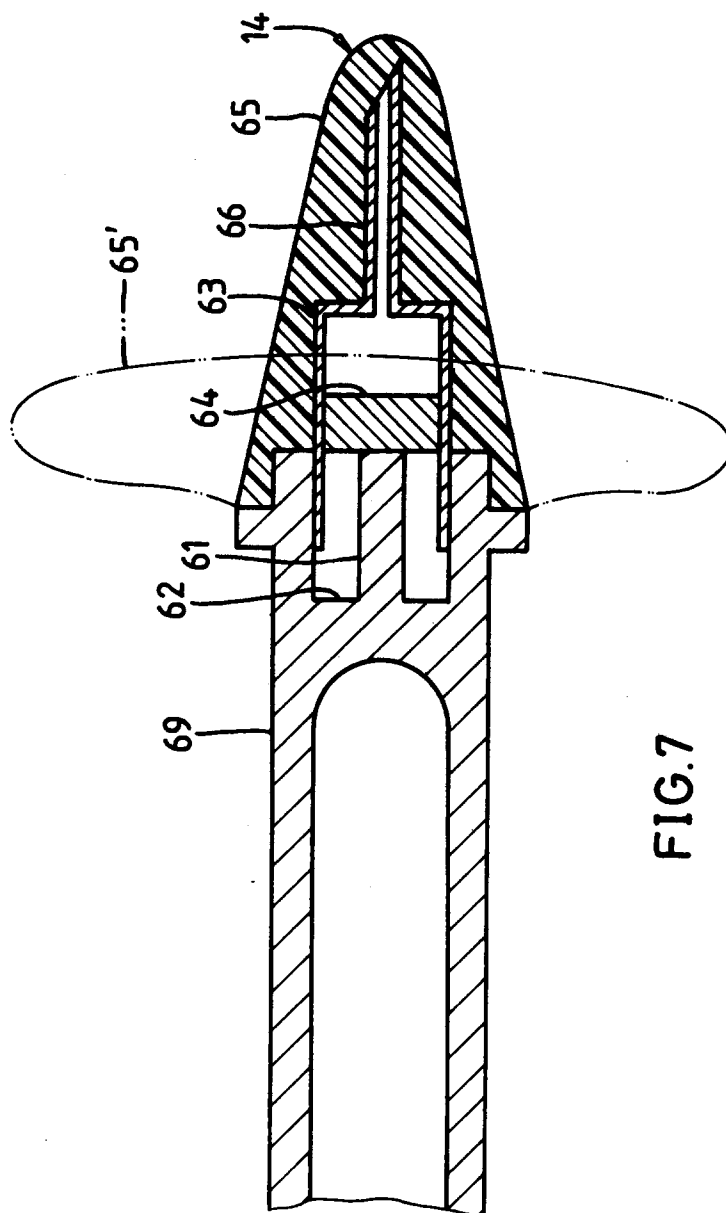


FIG.7



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EUROPEAN SEARCH REPORT

Application Number
EP 93 10 4874

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	US-A-2 962 017 (H. HOROWITZ) * column 2, line 27 - column 3, line 53; figures 1-5 * ---	1,3-5	F41B7/00 F42B12/54 F41G1/35 F41G1/02
Y	US-A-2 509 552 (J. WOLF) * column 1; figures 4-6 * ---	1,3-5	
Y	US-A-3 296 729 (F. STEVENS) * column 3, line 15 - line 25; figures 1,2 * ---	3	
Y	CH-A-29 708 (E. CAILLEZ) * the whole document * ---	4	
Y	US-A-4 934 086 (W. HOUDE-WALTER) * claim 1; figures 1-3 * ---	4	
Y	US-A-3 584 582 (C. MULLER) * column 1, line 27 - line 49; figures 1-3 * ---	5	
A	US-A-1 338 239 (J. MATYS) * figures 1,2 * ---	4	
A	US-A-3 502 025 (P. PAYNE) ---	5	
A	US-A-3 219 023 (J. RYAN) * column 2, line 16 - line 34; figure 4 * ---	1	
A	US-A-2 625 927 (I. ROSENBLOOM) ---		
A	US-A-3 369 534 (D. CROSMAN) ---		
A	US-A-2 977 950 (J. RYAN) ---		
A	US-A-3 009 453 (C. AYALA) -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 February 1994	Examiner Van der Plas, J
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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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,
namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,

namely:

see sheet -B-

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,
namely claims:
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,
namely claims:



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EP 93 10 4874 -B-

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1,2 : Revolver type spring gun with means for locking the projectiles in the firing chambers.
2. Claims 1,3,4 : Sighting device for a revolver.
3. Claims 1,5 : Hypodermic projectile.