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— *of inventorship (Rule 4.17(iv))*

Published:

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

AMMUNITION FOR FORMING AERIAL BARRAGE

TECHNICAL FIELD

The invention relates to air defence devices. The device is a multi-barrel cartridge ammunition with electric ignition for forming anti-aircraft aerial barrage by shooting the
5 ropes.

BACKGROUND

In the 20th century, many devices were developed to shot down aircraft using rope. For example, publication FR2708728 describes a weapon designed to shoot down low-flying helicopters using projectiles with attached ropes. This weapon is ground-based and heavy.

10 The 21st century has seen the emergence of a large number of light unmanned aerial vehicles. The emergence of targets with different technical characteristics requires the adaptation of known technical solutions to new tasks. Publication EP4339551 describes a drone with an attached rope used to hook another drone. A rope attached to a carrier drone worsens its manoeuvrability and can get caught in the propellers of the carrier drone
15 itself.

BRIEF SUMMARY

Ammunition for use on a light unmanned interceptor drone to combat other drones. The ammunition throws rope snare at the target's propeller. The ammunition is a cartridge with multiple barrels and containers. Multiple charges with separate electric activation designed
20 for a multiple attack possibility. The segments of the ropes are partially placed in containers and partially in projectiles. The rope forms an air barrier from the moment the shot is fired, which allows the target's propeller to become entangled at a short distance. Rope is laid in container in the form of spiral. Twisting the rope increases the likelihood of entanglement on the target. The projectile is a hollow capsule of brittle material with a rope
25 attached. When colliding with a propeller, the projectile breaks and absorbs the impact energy to reduces the chance of ricochet. Projectile filled with extra length of rope, it increases the likelihood of entangling the target's propeller. Projectiles and expelling charges are located in the barrels. Electric igniters are soldered to contact pads on the printed circuit board. The printed circuit board is the platform to which the barrels and
30 containers are glued. Cartridge or several cartridges are attached to the activation unit.

The activation unit is attached to the weapon carrier. Tests have shown that ammunition with dozens of shots weighs several tens of times less than a target it hits.

DRAWINGS

Figure 1 shows the collision of a propeller blade with a projectile capsule. Designated positions: 1 — projectile; 2 — rope; 3 — shot direction; 4 — propeller blade profile; 5 — blade movement direction.

Figure 2 shows the assembled weapon. Designated positions: 6 — activation unit; 7 — cable; 8 — screws; 9 — cartridges.

Figure 3 is a view of the cartridge from the target side. Designated positions: 1 — projectile; 2 — rope; 10 — platform; 11 — frame; 12 — barrel; 13 — container.

Figure 4 is a longitudinal section of the cartridge (A-A). Designated positions: 1 — projectile; 2 — rope; 10 — platform; 11 — frame; 12 — barrel; 13 — container; 14 — sealing tape; 15 — wad; 16 — expelling charge; 17 — igniter; 18 — contact pad.

EXAMPLE OF IMPLEMENTATION

Figure 1 shows the collision of a propeller blade (4) with a projectile capsule (1). Propeller blade (4) moves to the right (5). Projectile (1) with rope (2) is directed from above (3). The end of the rope (2) rotates due to the spiral unfolding. The projectile (1) breaks, the rope (2) fell out of the projectile (1).

Figure 2 shows the assembled weapon. The activation unit (6) is connected to the power source and control signal by a cable (7). Cartridges (9) are fixed on activation unit (6) using fastening screws (8). The activation unit (6) contains electric keys for supply of electric pulses to contact pads (18) of cartridges (9).

Figure 3 is a view of the cartridge (10) from the target side.

Figure 4 is a longitudinal section (A-A) of the cartridge (9). Barrel (12) and container (13) are glued to platform (10) and to frame (11). Part of rope (2) is laid in container (13) in the form of spiral. Part of rope (2) is laid in projectile (1). Projectile (1), wad (15) and expelling charge (16) are located in barrel (12). Sealing tape (14) is glued to frame (11). Igniter (17) is made of conductive wire. Wire passes through holes in platform (10) and is soldered to contact pads (18). Platform (10) is made of printed circuit board with cut holes and recesses.

Action. Voltage is applied to the contact pads (18), the wire (17) melts and ignites the expelling charge (16). Products of ejection charge (16) combustion push wad (15) and

projectile (1). The sealing tape (14) breaks and the projectile (1) flies out of the barrel (12). Projectile (1) pulls the rope (2) from the container (13). The rope (2) from the projectile (1) is completely unwound after the propeller (4) is hooked (Fig. 1).

INDUSTRIAL APPLICABILITY

- 5 The low weight of the weapon allows it to be used on a small interceptor drones. The weapon allows the interceptor drone to attack several times in one flight and go back. The high speed multi-shot weapon is suitable for hunting moving targets. Energy of the target's engine is used to block it, so muzzle energy can be small. Small-caliber ammunition is not dangerous to humans and is classified as pyrotechnics.

CLAIMS

1. Multibarrel cartridge ammunition with electric ignition, expelling charges and projectiles with attached ropes, **characterized in that** the barrels, rope containers and igniters are
5 attached to the printed circuit board with contact pads.
2. Cartridge ammunition of claim 1, **characterized in that** the rope is laid in a spiral shape in the container.
3. Cartridge ammunition of claim 1, **characterized in that** the projectile is a hollow capsule.
- 10 4. Cartridge ammunition of claim 1 and 3, **characterized in that** the projectile material is brittle.
5. Cartridge ammunition of claim 1 and 3, **characterized in that** the projectile is filled with rope.

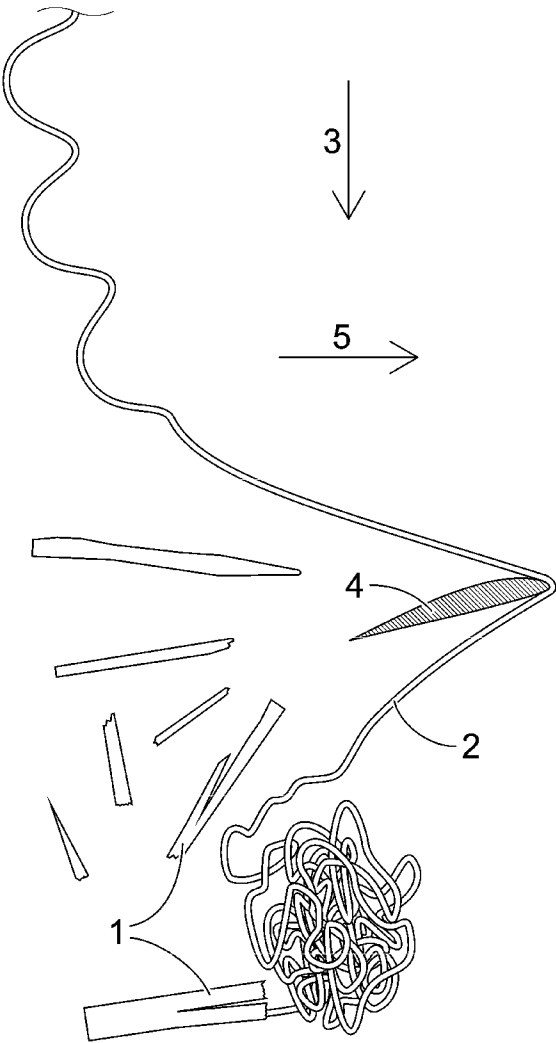


Fig. 1

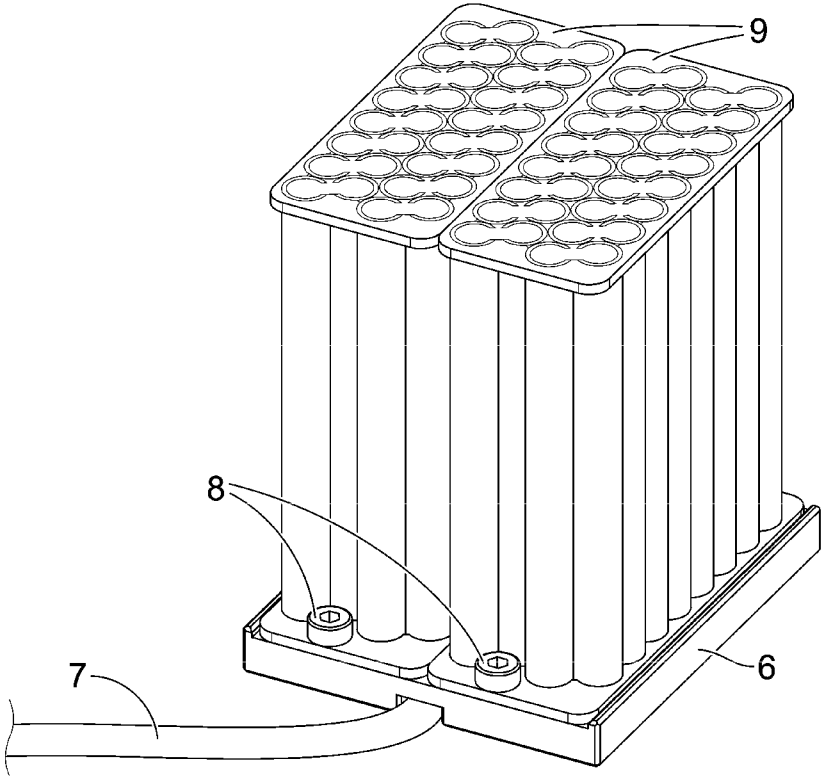


Fig. 2

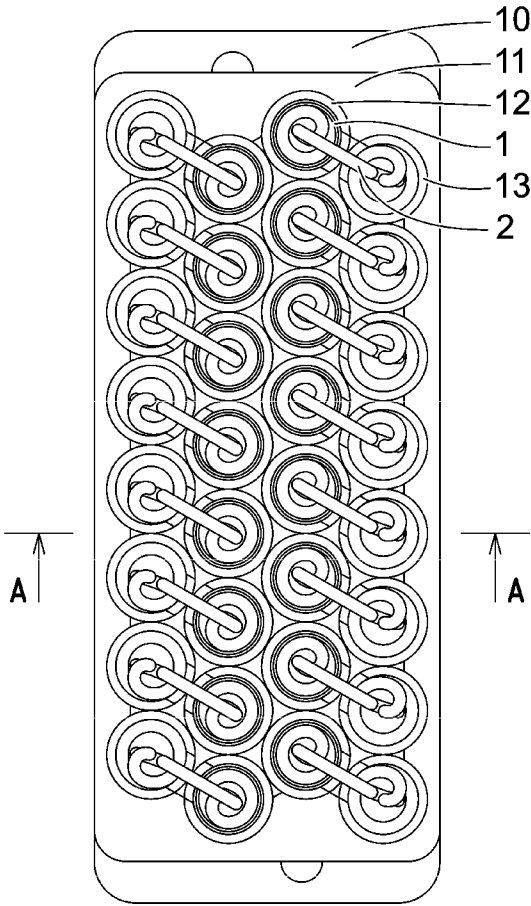


Fig. 3

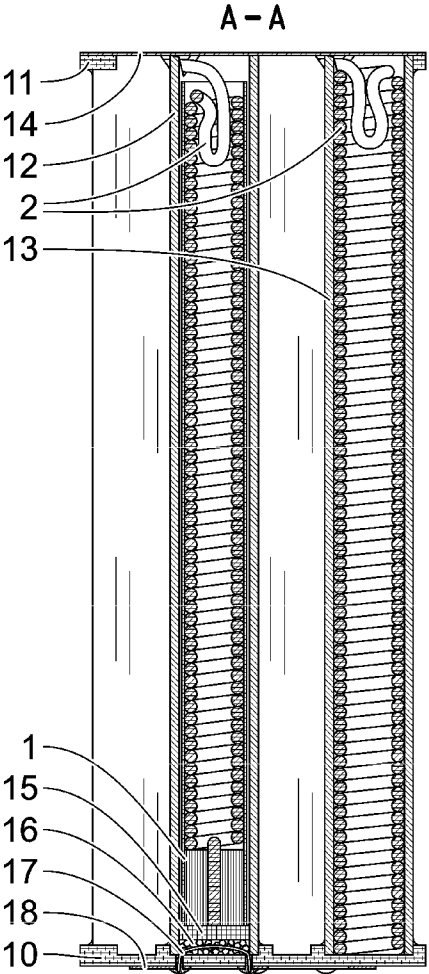


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2026/051253**A. CLASSIFICATION OF SUBJECT MATTER****INV. F41H11/04****ADD.**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F41H F41A F41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 708 728 A1 (CARPRIEAUX JEAN PAUL [FR]) 10 February 1995 (1995-02-10) claim 1; figures 1-4 -----	1-5
A	US 5 461 960 A (MARKS JOHN W G [GB] ET AL) 31 October 1995 (1995-10-31) claim 1; figures 1-9 -----	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2026/051253

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2708728	A1	10-02-1995	NONE	
US 5461960	A	31-10-1995	EP 0609026 A1	03-08-1994
			US 5461960 A	31-10-1995