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IRRITANT AGENT DEVICE

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ABSTRACT

An irritant agent device including an irritant agent element formed by an irritant agent cartridge such as a tear gas cartridge surrounded by a soft, resilient casing for protecting against physical injuries or mechanical damage at a target site and having a launching tube connected with element for facilitating the launching of the element from a barrel of a firearm. The launching tube is positioned within the casing and may be completely hidden within the casing such that no portion of the tube protrudes therefrom or may extend outwardly from the casing and be separable from the element after launching. The launching tube is also provided with a braking arrangement mounted thereon for aiding in the separation of the tube from the element after launching.

20 Claims, 14 Drawing Figures
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IRRITANT AGENT DEVICE

The present invention relates to an irritant agent device, especially for tear gas having a soft resilient casing, which can be fired without evoking the danger of physical injuries or mechanical damage to persons or objects at a target site.

Launchable tear gas devices are known which can be fired from a firearm with the aid of a launching pin. These devices have the disadvantage that they are not encased and can result in considerable bodily injuries when hitting a demonstrator. This is true, above all, if the pin or parts of the pin remain adhered to the tear gas device after firing.

Furthermore, tear gas devices are known from DOS No. 1,933,029 which are provided with a yielding, readily deformable casing. These devices can be launched by means of a launching bucket or the like and can reach distances of up to 80 meters. Since the transmission of the gas pressure during firing to the irritant gas cartridge is relatively minor, these devices can, however, be employed for greater distances only if the casing is made more rigid. This, in turn, again results in an increase in the danger of injuries caused by the impinging devices.

Therefore, it is an object of the present invention to avoid the above-described disadvantages and to develop an irritant gas device which, firstly, can be fired over larger distances and, secondly, even in such a case still does not create any danger of injuries.

In accordance with the present invention, an irritant gas device is provided with a soft, resilient casing, and the device has a launching tube connected thereto. The launching tube serves for firing the irritant gas device over the indicated distance by attachment to a firearm barrel. The firearm then carries normally corresponding mounts in order to permit launching of the irritant gas device therefrom. The launching tube may be made of metal such as steel, aluminium, brass, or the like, or of high-strength synthetic resins, for example, of the polycarbonate type, and especially of glass-fibre-reinforced plastics.

In accordance with the present invention, the firing gas pressure is transmitted practically entirely to the irritant gas cartridge such that the advantage is obtained that greater firing distances are feasible. For this purpose, the launching tube can be fixedly joined to the irritant gas cartridge proper and/or with the casing. A connection with the casing is established, for example, by molding the launching tube with the casing material. The fixed connection of the launching tube with the irritant gas cartridge can be established, for example, by screws, by gluing, or the like, but also by way of a spacer element which is not elastically deformable.

According to a feature of the present invention, the launching tube is arranged hidden within the casing, in order to obviate the danger of possible injuries upon the impingement of the irritant gas device. However, in case of launching tubes of a synthetic resin, it is not absolutely necessary to embed the tube completely, under certain circumstances.

In accordance with an embodiment of this invention, the provision is made to detachably join the launching tube to the irritant gas device. For this purpose, the launching tube can be held in the casing, for example, in a frictional connection. The launching tube is preferably provided with a braking arrangement which serves to make the launching tube drop to the ground within an observable range in front of the muzzle of the firearm launching the device. The separation of irritant gas device and launching tube then takes place due to the differing drag coefficients, the so-called $C_d$ values or aerodynamic forces, of the irritant gas device and the launching tube with the braking arrangement.

According to another feature of the present invention, it is possible to provide a small ejection charge for the launching tube, which charge is ignited after a delay period by the hot powder gases during firing and is accommodated, for example, in the irritant gas cartridge. This feature can likewise accomplish a separation of launching tube and irritant gas device.

Advantageously, the irritant gas device is conventionally equipped with two ignition systems, wherein one ignition system can be operated manually, and serves for initiating the operation when throwing the device by hand, while the other ignition system is actuated by firing gas pressure and serves for initiating the function during firing.

These further objects, features and advantages of the present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, several embodiments in accordance with the present invention, and wherein

FIG. 1 is a sectional view of an irritant agent device with an ejectable launching tube in accordance with the present invention;

FIG. 2 is a sectional view of an irritant agent device with a launching tube separable therefrom by different drag characteristics;

FIG. 3 is a sectional view of an irritant agent device with a launching tube hidden within the casing; and

FIGS. 4a, 4b, 5a, 5b, 6a, 6b, 7a, 7b and 8a - 8c illustrate different embodiments of the braking arrangement of the launching tube, in a longitudinal section and in a front or rear view with FIG. 8 also including a partial plan view.

Referring now to the drawings wherein like reference numerals are utilized to designate like parts throughout the several views, there is shown in FIG. 1 an irritant agent device 1 including an irritant agent element formed by an irritant gas cartridge 2, equipped with the soft, elastic casing 3. A launching tube 4 is joined to the irritant gas cartridge and extends outwardly from the casing 3. A small ejection charge 6 is disposed in the irritant gas cartridge 2 and this charge effects the ejection of the launching tube 4 after a certain delay period in the conventional manner.

In the irritant agent device 1 illustrated in FIG. 2, the launching tube 4 carries a disk 5, for example, of a soft synthetic resin. After launching from a firearm, the irritant agent device 1 separates from the launching tube 4, due to the considerable differences in the $C_d$-values such that the launching tube then drops to the ground within an observable distance from the barrel muzzle. Additionally, a special ejection charge 6 may also be provided in this embodiment to effect the ejection of the launching tube. With such an arrangement, the field of application lies at distances of up to 400 meters. The braking arrangement 5 can be constructed, for example, integrally with the launching tube 4, or it can be connected with the latter by flanging, Seeger ring, i.e., circlip ring connection, or the like.
FIG. 3 illustrates an irritant agent device having the soft casing 3 thereof extended toward the rear to such an extent that the launching tube 4 is hidden within the casing 3. This avoids any danger of injuries to people within the target area when using such devices.

As shown in FIGS. 4-8, different embodiments for the launching tube and braking arrangement are illustrated which differ considerably with respect to their C<sub>W</sub>-values or aerodynamic values. These different aerodynamic braking arrangements make it possible to separate the launching tube and braking arrangement from the irritant agent device within the observable range in front of the muzzle of the firearm barrel existing and/or given in any individual instance. With regard to the order of magnitude, the C<sub>W</sub>-value of the braking arrangement is generally twice as large as the C<sub>W</sub>-value of the encased irritant agent devices. Since the braking arrangements 5 are not separated immediately after launching or firing of the irritant agent devices 1 from such devices, they can be additionally employed for the stabilization of the flight path of the irritant agent devices. For example, as shown in FIGS. 4a and 4b, the braking arrangement 5a includes stabilizer fins 7 arranged in a ring 8 so as to provide flight stabilization. In contrast thereto, a relatively rapid separation is effected, for example, by the braking arrangement 5c shown in FIGS. 6 and 6b wherein the braking arrangement is in the form of two abutting truncated cones 9 and 10, of which the larger cone 9 is opened toward the flight direction. A separation after only a longer flight period is characteristic for the embodiment shown in FIGS. 5a and 5b wherein the disk 5 of FIG. 2 is replaced by a perforated disk 5b. The braking arrangement 5d of FIGS. 7a and 7b is provided with deflector members 11 on the disk, while the braking arrangement 5e in FIGS. 8a and 8b consists of four wings 12. In the embodiments of FIGS. 7 and 8, the launching tube 4, after separation from the irritant agent device 1, is set into rotation due to the deflector faces or wings, respectively, so that the range of the launching tube is reduced by this energy-consuming procedure.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It should, therefore, be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

We claim:

1. An irritant agent device comprising an irritant agent element including a cartridge for housing an irritant agent and a soft, resilient casing provided about said cartridge, and launching tube means connected with said irritant agent element and positioned in said resilient casing for facilitating the launching of said element, said launching tube means being detachably connected with said irritant agent element for separation from said element after launching of said element, said launching tube means including aerodynamic braking means responsive to airflow after launching of said element for aiding in the separation of said launching tube means from said irritant agent element.

2. An irritant agent device according to claim 1, wherein said launching tube means is arranged for detachable coupling with a barrel of a firearm for the launching of said irritant agent element.

3. An irritant agent device according to claim 1, wherein said launching tube means is positioned in said casing.

4. An irritant agent device according to claim 1, wherein said launching tube means frictionally engages said casing to form the detachable connection with said irritant agent element.

5. An irritant agent device according to claim 1, wherein said launching tube means is formed of a material selected from the group consisting of metal and synthetic resinous material.

6. An irritant agent device according to claim 1, wherein said irritant agent is tear gas.

7. An irritant agent device comprising an irritant agent element including a cartridge for housing an irritant agent and a soft, resilient casing provided about said cartridge, and launching tube means connected with said irritant agent element and positioned in said resilient casing for facilitating the launching of said element, said launching tube means being detachably connected with said irritant agent element for separation from said element after launching of said element, said launching tube means including a hollow launching tube having one end positioned within said casing, and a braking means fixedly attached to said launching tube for aiding in the separation of said launching tube from said irritant agent element.

8. An irritant agent device according to claim 7, wherein said braking means is a disc attached to the free end of said launching tube for providing separation of said launching tube from said element within a maximum launching tube range.

9. An irritant agent device according to claim 8, wherein said disc is provided with perforations therein.

10. An irritant agent device according to claim 7, wherein said braking means includes stabilizer fins mounted at the free end of said launching tube for aiding in the stabilization of the flight path of said element.

11. An irritant agent device according to claim 7, wherein said braking means includes a truncated cone-shaped member having the base of the cone open in the flight direction of said element and receiving a portion of said resilient casing therein.

12. An irritant agent device according to claim 7, wherein said braking means includes two abutting truncated cone-shaped members of different sizes mounted at said launching tube, one of said truncated cone-shaped members being larger than the other, and having the base thereof open in the flight direction of said irritant agent element.

13. An irritant agent device according to claim 7, wherein said braking means includes means attached to the free end of said launching tube for rotating said launching tube after separation of said launching tube from said irritant agent element.

14. An irritant agent device according to claim 7, wherein said braking means includes a disc attached to the free end of said launching tube and having deflector means thereon for rotating said launching tube after separation of said launching tube from said element.

15. An irritant agent device according to claim 7, wherein said braking means includes a plurality of wing members mounted on and extending radially from said launching tube for rotating said launching tube after separation of said launching tube from said element.

16. An irritant agent device according to claim 7, wherein said braking means includes aerodynamic
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braking means responsive to air flow after launching of said element.
17. An irritant agent device comprising an irritant agent element including a cartridge for housing an irritant agent and a soft, resilient casing provided about said cartridge, and launching tube means connected with said irritant agent element and positioned in said resilient casing for facilitating the launching of said element, said launching tube means being detachably connected with said irritant agent element for separation from said element after launching of said element, said irritant agent element being provided with ejecting charge means for ejecting said launching tube means from said element.
18. An irritant agent device according to claim 17, wherein said ejection charge means ejects said launching tube means from said element after a predetermined delay.
19. An irritant agent device comprising an irritant agent element including a cartridge for housing an irritant agent and a soft, resilient casing provided about said cartridge, and launching tube means connected with said irritant agent element for facilitating the launching of said element and being disposed within said casing such that no portion of said launching tube means protrudes from said casing, said launching tube means including a hollow tubular member arranged for detachable coupling with a barrel of a firearm for launching of said irritant agent element, said tubular member being secured within said resilient casing.
20. An irritant agent device according to claim 19, wherein said tubular member is arranged for sliding movement over the barrel of the firearm.

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