

SAFETY DEVICES FOR HAND-GRENADES

The invention relates to a hand-grenade comprising a combined ring and clasp safety device to prevent an unintentional arming of the hand-grenade when the safety device is in a safe position in which it secures an arming lever and a protective cap on the hand-grenade.

A hand-grenade pin in the manner of a combined ring and clasp safety device is known from EP 0 215 160 B1. A ring is connected to a clasp by way of an eyelet provided on the clasp. The clasp possesses a plug-in pin for the form-locking securing of a jettisonable hand-grenade an arming lever such as a curved handle and a locking or safety pin with a projection for securing the ring as well as a hook for securing the plug-in pin. Upon arming the ring is pulled to snap over the projection and then serves in the swung-out state for rotation of the locking pin and subsequent extraction of the plug-in pin from the hand-grenade. Production of this safety device is cost-intensive, since, for the securing of the ring on the projection, close tolerances have to be maintained to ensure that the ring can be both definedly and reliably snapped-in and snapped-out. The production process is complex by reason of the necessary heat treatments in the bent state of the safety device.

The problem underlying the invention is to provide a safety device which is inexpensive to produce and in the

case of which the tolerance problems in accordance with EP
O 215 160 B1 are precluded.

The present invention generally provides a hand-
5 grenade comprising combined ring and clasp safety device
to prevent an unintentional arming of the hand-grenade,
the safety device comprising a ring connected to a clasp
by way of an eyelet, the clasp comprising a plug-in pin
and, extending parallel thereto, a locking pin having a
10 hook at the free end to releasably retain the safety
device in a safe position in which the plug-in pin secures
an arming lever and a protective cap on the hand-grenade;
wherein the ring can be clipped into a detent holder
formed by a pair of resilient limbs which project from a
15 bush on the protective cap and which have detent
projections at their free ends, and wherein the hook
extends through the detent holder to engage at least two
arcuately spaced portions of the surface of the bush.

20 The invention more particularly provides a hand-
grenade comprising combined ring and clasp safety device
to prevent an unintentional arming of the hand-grenade,
the safety device comprising a ring connected to a clasp
by way of an eyelet, the clasp comprising a plug-in pin
25 and, extending parallel thereto, a locking pin having a
hook at the free end to releasably retain the safety
device in a safe position in which the plug-in pin secures
an arming lever and a protective cap on the hand-grenade;

wherein the hook of the locking pin ^{THROUGH} EXTENDS / A detent holder into which the ring is clipped and the free end of the hook BUTTS AGAINST a circumference of a bush, which bush is provided on the protective cap and carries
5 resilient limbs with detent projections which serve as the detent holder.

The invention enables the tolerance problems to be avoided, by virtue of the detention of the ring being
10 effected independently of the locking pin provided with the hook. Thus, the combined ring and clasp safety device is considerably simpler to produce and also cost-intensive tight tolerances are not involved.

15 The degree of safety of the ring and clasp safety device is determinable in a simple manner by appropriate curving of length of the hook, e.g. through 120° to 180°. Thus, an accidental arming upon the handling of the hand-grenade or an arming in the country in open country by
20 hooking or snagging of the locking ring e.g. upon branches or other objects are precluded to the necessary extent. This is because a pure tractive loading of the safety device does not lead to the arming of the hand-grenade. The coupled or composite movements necessary for the
25 arming of the hand-grenade, namely rotation of the ring with simultaneous tractive stress, represents the necessary safety factor.

An exemplified embodiment of the invention is shown in the accompanying diagrammatic drawings, wherein:-

FIGURE 1 shows a safety device on a hand-grenade,

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FIGURE 2 shows the safety device in accordance with FIGURE 1 upon the arming, and

FIGURE 3 shows the safety device in accordance with
10 FIGURES 1 and 2.

On a hand-grenade 1 in the region of a fuze 2 a protective cap 3 for the fuze 2 is superimposed in an interengaging, but jettisonable, manner. In the same way
15 a hand-grenade arming lever 4 engages in an interengaging and jettisonable manner on the hand-grenade 1, in which respect the hand-grenade arming lever 4 in its secured position secures in its safe position a striking hammer, which hammer is movable under spring force and is not
20 shown.

The protective cap 3 and the hand-grenade lever 4 posses axially aligned bores 5, the protective cap 3

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having a cylindrical bush 6 with two resilient legs 7 and dogs 8, to define a detent holder.

A combined ring and clasp safety device 20 consists of a coiled wire ring 21 and of a bent wire clasp 22 having a coil forming an eyelet 23 for the retention of the ring 21.

The clasp 22 includes a straight plug-in pin 24, a locking limb 25 extending parallel thereto and a curved hook 26 arranged at one end of the limb 25. The hook 26 has a circular arc or curve 27 of about 180°. Its radius is so designed that it butts, under a bias, against the circumference of the cylindrical bush 6.

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For the securing of the hand-grenade 1, the plug-in pin 24 secures the protective cap 3 and the hand-grenade lever 4 on the hand-grenade 1 in accordance with FIGURE 1. At the same time the locking pin 25 and the ring 21 straddle the hand-grenade lever 4. The hook 26 butts against the circumference or peripheral surface of the cylindrical bush 6 and penetrates, in this respect, between the limbs 7. The ring 21 is clipped into the detent holder between the limbs 7 in which it is held against extraction by the detent projections 8.

For the arming of the hand-grenade 1, first of all the ring 21 has to be unclipped from the limbs 7 and be

swivelled into the position in accordance with FIGURE 2. In this respect, the protective cap 3 and the hand-grenade lever 4 are still completely secured.

5 By rotation of the ring 21 in the direction of an arrow 30 about an axis 31, which represents the extension of the locking pin 25, the hook 26 is swivelled in the direction of the arrow 30 until its end 32 passes outside the limbs 7. The swivel motion of the hook 36 is
10 effected, in this respect, about an axis 33 represented by the plug-in pin 24. By a subsequent tractive or tugging motion at the ring 21 in the arrow direction 34 along with maintenance of the clasp bias by rotation of the ring 21 in the direction of the arrow 30 the clasp 22 is pulled
15 off from the protective cap. Thus, the hand-grenade 1 is armed, the hand-grenade lever 4 still being kept in the safe position by one hand of the infantryman.

If the hand-grenade 1 is now thrown, then the hand-
20 grenade lever 4 is no longer pressed against the hand-grenade 1, so that it (by reason of the spring bias of a striking hammer of the grenade) swivels outwards, and the lever together with the protective cap 3 are thrown off from the hand-grenade 1. The initiation of the detonation
25 of the hand-grenade is then effected.

Instead of the arcuate curve 27 it is, without impairing the function, also possible to design the hook

26 similar to a curve, for example angularly, by this angular hook butting at least against two spaced apart points on the cylindrical bush 6, e.g. between the limbs 7 and at its free end 32.

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It will be readily appreciated that there is herein generally disclosed a combined ring and clasp safety device 20,21 for a hand-grenade 1 which has, for securing a resiliently biased hand-grenade lever 4, a ring 2 which
10 can be clipped-in on a protective cap 3, as well as a clasp 22 connected hingedly to the ring 21. The clasp 22 has plug-in pin 24 which secures the protective cap 3 and the hand-grenade lever 4 together to maintain a form-locking or interengaging connection of the two aforesaid
15 parts on a hand-grenade 1. A locking pin 25 of the clasp 22 possesses a hook 26. The hook 26 prevents an extraction of the plug-in pin 24 upon a pure tractive stress at the ring 21 or at the plug-in pin 24. For the arming a coupled rotary/tractive motion by way of the ring
20 21 is necessary, in which respect a minimum rotation corresponding to the length of the curve 27 past the roots of the limbs 7 is necessary.

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CLAIMS

1. A hand-grenade comprising combined ring and clasp safety device to prevent an unintentional arming of the hand-grenade, the safety device comprising a ring connected to a clasp by way of an eyelet, the clasp comprising a plug-in pin and, extending parallel thereto, a locking pin having a hook at the free end to releasably retain the safety device in a safe position in which the plug-in pin secures an arming lever and a protective cap on the hand-grenade; wherein the ring can be clipped into a detent holder formed by a pair of resilient limbs which project from a bush on the protective cap and which have detent projections at their free ends, and wherein the hook extends through the detent holder to engage at least two arcuately spaced portions of the surface of the bush.

2. A hand-grenade comprising combined ring and clasp safety device to prevent an unintentional arming of the hand-grenade, the safety device comprising a ring connected to a clasp by way of an eyelet, the clasp comprising a plug-in pin and, extending parallel thereto, a locking pin having a hook at the free end to releasably retain the safety device in a safe position in which the plug-in pin secures an arming lever and a protective cap on the hand-grenade; wherein the hook of the locking pin ^{THROUGH} EXTENDS / A detent holder into which the ring is clipped and the free end of the hook BUTTS AGAINST a



circumference of a bush, which bush is provided on the protective cap and carries resilient limbs with detent projections which serve as the detent holder.

5 3. A hand-grenade as claimed in Claim 1 or 2 wherein the hook extends over an angular extent of between 120° and 180°.

4. A hand-grenade as claimed in Claim 2 or 3 wherein the
10 hook is shaped as a curve and butts against a cylindrical surface of the bush.

5. A hand-grenade substantially as hereinbefore described with reference to the accompanying drawings.

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6. A safety device and protective cap constructed and arranged to constitute the safety device and protective cap of a hand grenade as claimed in any preceding claim.

20 7. A safety device and protective cap substantially as hereinbefore described and as shown in the accompanying drawings.