Title: GAS SPRAY HOLSTER

Abstract: The invention relates to a gas spray holster (10) comprising a holster part (16) including belt fasteners (13), an inner frame (15) for holding a standard gas spray (14), and mutual connecting means. These comprise quick coupling means (17) with a release handle (20) and a lifting spring (26) for improving the lifting of the inner frame (15).
GAS SPRAY HOLSTER

The invention relates to a gas spray holster comprising the following:

- a holster part including belt fasteners,
- an inner frame for holding a standard gas spray said inner frame including a finger detent for fingers,
- mutual connecting means between the holster part and the inner frame.

In known gas spray holsters, taking the gas spray into use is difficult and slow. Very often, in sudden situations requiring use of force, the gas spray comes to the user's hand such that the nozzle part of the gas spray points to a wrong direction, even towards the user him-/herself. The slow introducibility into use of a gas spray and its incorrect position have caused many hazardous situations and even physical damage in situations where the user of the gas spray has not been able to take his/her gas spray out of the holster sufficiently quickly in a use of force situation.

Present gas spray holsters are mainly holsters made of leather or fabric. The top part of the gas spray is protected by a flap provided with a press stud fastening, which flap is opened before taking the gas spray from the holster. After this, the top part of the gas spray is grasped with fingers and the gas spray is pulled out of the holster. The gas spray comes out of the holster in such a position that the gas spray cannot be used with the same grip.

Various types of commonly used gas spray models exist and they can be divided, based on the shape of the gas spray jet, into gas spray models equipped with a cone-shaped, a point-shaped, or a cloud-shaped spray jet. The most popular gas spray model used by the authorities and the security business is the gas
spray model with the point-shaped jet since using a spray gun with the cloud-shaped and cone-shaped jet indoors, for example, exposes also all bystanders to the gas. When used outdoors, the cloud-shaped and cone-shaped model gas sprays are very sensitive to wind, and in the worst case, the user receives the gas into his/her own eyes. A significant aspect in the point-shaped gas spray is that the gas spray jet (liquid spray jet) requires high accuracy, and a desired effect is not achieved if the gas spray jet, for example, goes by the face of the target.

An additional problem discovered in the present gas spray holsters is also slackening of holsters based on friction, which may cause unintentional falling of the gas spray out of the holster. A problem with the friction-operated holsters is sticking of the gas spray in the holster, rusting of the press stud in the securing flap, which prevents opening the holster, as well as damaging of the gas spray bottle due to friction against the metal part of the press stud.

Currently, the best holster in the market is a two-part gas spray holster manufactured by Peter Jones (ILG) Ltd., marketed with the product name "non lethal spray holder P175" wherein the gas spray bottle is surrounded by a rubber-like frame. The hip side of the holster part includes a rail that fastens to a bracket in the belt. This holster is also protected with a leather flap and press stud fastening, which delays its use in hazards.

In the gas spray holster disclosed in US patent application 2007/0039989 A1, also representing the prior art, the gas spray is locked in the holster with a locking latch. When the locking latch is released, a spring at the bottom of the holster lifts the gas spray from the holster. In this model, the gas spray must be of a special construction to be suitable for use together with the locking mechanism.
The object of the invention is to provide a gas spray holster from which a standard type gas spray can be taken out quickly and easily, always correctly directed, and which is equipped with a secure safety mechanism. More precisely, the gas spray holster according to the invention is characterized by what is claimed in the appended claim 1.

This object can be achieved according to the invention with a gas spray holster including a holster part with belt fasteners, an inner frame for holding a standard gas spray, with said inner frame including a finger detent for fingers and mutual connecting means for the holster part and the inner frame. It is essential that the mutual connecting means include quick locking means with a release handle and a lifting spring for improving the lifting of the inner frame. With the mutual connecting means, the gas spray can be taken into use quickly and reliably and it is always correctly directed. In addition, the mutual connecting means ensure that seizing the gas spray from the gas spray holster is difficult.

Advantageously, the mutual connecting means further include a guard articulated to the holster part for protecting the release button included in the gas spray. The guard can be quickly turned away when the gas spray is needed and it functions as a second coupling means beside the quick coupling means.

The quick coupling means can be spring loaded. According to an embodiment, the quick coupling means include a spring wire with an elastic part that is parallel to the bottom of the holster part, forms an open loop and is set against the inner frame, vertical parts perpendicular to the bottom of the holster part, and foot parts parallel to the bottom of the holster part for supporting the spring to the bottom of the holster part. The spring wire provides an appropriate amount of force for lifting the inner frame, sufficient for lifting the gas spray slightly
upwards but not flinging the gas spray too high, in which case it could drop from the holster part.

According to an embodiment, the inner frame includes a body part adapted for its internal size for fastening the gas spray thereto. The body part protects the gas spray bottle from dents and scratches.

The gas spray holster is advantageously adapted for standard gas sprays. The gas spray holster can be used for the most common gas sprays directly or with minor modifications.

According to an embodiment, the quick coupling means include a release handle articulated to the holster part wherein the locking latch is adapted to a detent in the body part of the inner frame. With the release handle, the gas spray can be quickly and reliably released from the holster part.

In the holster part, the belt fastener can include a fastening point, a belt loop part for turning the gas spray holster 360° relative to the user's belt, and teeth for locking the fastening point and the belt loop part relative to each other. With the belt fastener, the position of the gas spray holster on the user's belt can be freely determined.

For the finger grip, a groove-like finger detent accommodating the forefinger can be present in the inner frame of the gas spray holster and in part of the holster part, for lifting and directing the inner frame from the holster part. Using the finger detent, the gas spray is easy to lift from the holster part and a good grip can be taken from the gas spray. According to an embodiment, the body part of the inner frame has guide rails for directing the inner frame to the holster part. Due to the guide rails, the gas spray is always in the correct position in the holster part and it is in the correct position as regards directing.
The gas spray holster can be made of a polymer blend. A polymer blend is a light and durable material, which is important in the application of gas spray holsters. Advantageously, the guard and the finger detent have roughened surfaces for improving the grip.

According to an embodiment, the gas spray holster includes reeling means between the inner frame and the holster part adapted to reel the inner frame, connected to a wire, back to the vicinity of the holster part. The reeling means can include a wire connected between the inner frame and the holster part and a spring-operated wire reeling device connected to the holster part.

A double locking system is adapted in the gas spray holster by means of the quick coupling means and the guard for locking the gas spray to the gas spray holster. In order to snatch the gas spray, the snatcher should be able to release both locking systems, which is very difficult in practice.

The invention is described below in detail by making reference to the enclosed drawings which illustrate some of the embodiments of the invention, in which

Figure 1 is an axonometric oblique front view of the gas spray holster according to the invention wherein the gas spray bottle is installed in the inner frame, with the guard in the bottom position,

Figures 2a - 2b are axonometric oblique rear views of the gas spray holster according to the invention wherein the gas spray bottle is installed in the inner frame, with the guard in the bottom and top positions,

Figures 3a - 3b are side and rear views of the gas spray holster according to the invention wherein
the gas spray bottle is installed in the inner frame, with the inner frame released and slightly lifted from the holster part, are side views of the gas spray holster according to the invention wherein the gas spray bottle is installed in the inner frame, with the inner frame released and lifted out of the holster part, are cross-sectional views of the gas spray holster according to the invention wherein the gas spray bottle is installed in the inner frame, with the guard in the bottom and top positions, are axonometric oblique front views of the holster part, frame part and gas spray of the gas spray holster according to the invention, is a rear view of the inner frame of the gas spray holster according to the invention wherein the gas spray bottle is installed in the inner frame, is a side view of the holster part of the gas spray holster according to the invention, without the frame part and gas spray, is a cross-sectional view of another embodiment of the gas spray holster according to the invention, with the guard closed, wherein the lifting spring is a spring wire, is an axonometric oblique front view of the embodiment of the gas spray holster according to Figure 9, with the guard opened.
Figure 1 shows an axonometric view of the gas spray holster 10 according to the invention. The gas spray holster 10 is fastened to the user's belt with a belt fastener 13. Deviating from the prior art, the fastening angle of the gas spray holster 10 relative to the belt can be adjusted for 360°. The gas spray 14 is connected by means of friction to the inside of the inner frame 15 by the container part 27. In addition, disposed around the inner frame 15 there is a fastening band (not shown) which helps keeping the container part 27 of the gas spray 14 in place in the inner frame 15.

Figures 2a and 2b show an axonometric oblique rear view of the gas spray holster 10 according to the invention with the guard 12 in the top and bottom positions. The holster part 16 has a quick coupling means which automatically locks the gas spray bottle 14 including the inner frame 15 to the holster part 16. The quick coupling means are composed of a release handle, articulated to the holster part, the release handle having a locking latch adapted to a detent in the body part of the inner frame. A guard 12 is articulated to the top section of the holster part. The guard 12 protects the release button 28 of the gas spray and the entire top section of the gas spray 14 from damage and snatching attempts. The guard is provided with friction-based resistance which locks the guard in either the top or bottom position but does not cause friction when lifting/lowering the guard. The guard 12 and the finger detent 18 may have a roughened surface (not shown) which ensures a better finger grip against the surface.

For snatching attempts, the gas spray holster includes mutual connecting means between the holster part and the inner frame, including quick coupling means 17 (Figures 5a and 5b) and a guard 12. In its top position the guard 12 prevents mechanically releasing the inner frame 15 from the holster part 16 when pressing the release handle 20. In practice, the gas spray holster has a double locking system; that is, for
releasing the gas spray, it is first necessary to open the guard and then undo the quick coupling means in order to get the gas spray in hand.

Figures 3a - 4b illustrate the various steps of taking the gas spray 14 into use. When using the gas spray 14, the guard 12 is pulled back for about 50° by the thumb, the holster part 16 is grasped with a finger grip placing the forefinger in the finger detent 18 present in the inner frame 15, leaving the thumb in the top part of the gas spray 14 and grasping the release handle 20 with the rest of the fingers. By pressing the release handle 20, the quick coupling means 17 of Figures 5a and 5b are released and the inner frame 15 lifts up for 1 - 10 mm. After this, the inner frame 15 together with the spray bottle 14 is pulled up using the thumb-forefinger grip and the rest of the fingers get a firm hold from the body part 22 of the inner frame 15 while the inner frame 15 has been completely lifted up from the holster part 16. The inner frame 15 protects the container part 27 from impacts, scratches and wearing. A damaged gas spray must always be immediately replaced with a new one to avoid that the gas escapes from the opening possibly caused by the damage. The container part 27 of the gas spray 14 is kept inside the inner frame 15 for the entire period of use being thus protected from impacts and scratches even though the gas spray would be dropped down in a use of force situation.

Figures 5a and 5b show a lateral cross-sectional view of the gas spray holster 10 according to the invention. When encasing again, the inner frame 15 together with the gas spray 14 is placed against the guide rails 29 located inside the holster part 16 and pressed down whereupon the quick coupling means 17 lock the inner frame 15 to the holster part 16. The guard 12 articulated to the holster part 12 is turned back to the top position using the thumb. Guide rails 29 on the outer surface of the inner frame 15 ensure that the gas spray 14 goes to the
gas spray holster 10 only in the correct position. The guide rails 29 are shown better in Figure 7.

When the quick coupling means 17 of the gas spray holster 10 are in the locked position, the locking spring 24 turns the release handle 20 relative to the shaft 30 whereupon the locking latch 32 is in the detent 34 of the inner frame 15 and thus prevents lifting of the inner frame 15. More precisely, the detent 34 is an indentation in the body part 22 of the inner frame 15. The detent 34 can also be a protrusion appropriate for the purpose.

When opening the quick coupling means 17 of the gas spray holster 10, the user of the gas spray holster 10 presses the release handle 20 fully down, the locking spring 24 is compressed, the release handle 20 turns relative to the shaft 30 and the locking latch 32 moves away from the detent 34 of the inner frame 15. The detent 34 is designed as a counter part of the locking latch 32. Thus the lifting spring 26 located at the bottom of the holster part 16 lifts the inner frame 15 for about 1 - 10 mm, after which the inner frame 15 can be lifted out of the holster part 16 with a finger grip using the finger detent 18. In the locked position, the lifting spring is adapted to remain stressed against the quick coupling means, and upon opening the quick coupling means using the release handle, this stress is adapted to be released whereby the lifting spring pushes the inner frame outwards.

An essential aspect of the release handle 20 is its locking latch 32 having a free position and a locked position. Instead of an articulation, the release handle can also be slidable along a path adapted for it.

Figures 6a - 6c show the main components of the gas spray holster 10: the holster part 16, the inner frame 15 and the gas spray 14. Designed for the forefinger, the inner frame 15 has
a finger detent 18, the heavily grooved shape of which provides a support surface for the forefinger for pulling up the inner frame 15 out of the holster part 16. The finger detent 18 begins from the holster part 16 of the gas spray holster 10 and extends over the entire width of the part that is visible during the locked state of the inner frame 15. This enables taking the inner frame 15 and the gas spray 14 quickly in use after releasing the quick coupling means 17. With the finger detent 18, the user immediately gets a good and firm hold of the inner frame 15. At the same time, the gas spray 14 comes to the hand automatically in the correct direction as regards use, which saves time in a critical use of force situation. Due to the finger detent 18 and the guide rails 29, the inner frame 15 can be locked again in the holster part only in the correct direction.

Figure 7 shows the gas spray 14 inside the inner frame 15 seen from the opposite side relative to the spraying direction. The figure shows a hinge component 37 with a special construction with which the halves of the inner frame are connected together.

Figure 8 shows the mere holster part 16 of the gas spray holster 10 seen from the direction of the belt fastener 13. The belt loop part 23 of the belt fastener is connected to the fastening point 31 on the side of the holster part with a fastener 21. The surfaces between both the belt loop part 23 and the fastening point 31 are provided with teeth 33 with which the user can adjust the angle between the user's belt and the gas spray holster 10 according to the invention as desired and then lock the gas spray holster 10 in this position. This feature, too, facilitates taking the gas spray 14 into use.

Figures 9 and 10 show an embodiment of the gas spray holster according to the invention wherein the lifting spring 26 is a spring wire 26'. The spring wire 26' is advantageously a spring
made of one wire including an elastic part 36 in the form of an open loop against which the bottom of the gas spray is set. The elastic part 36 is parallel to the bottom. For elasticity, the spring wire 26' has vertical parts 38 with which the elastic part 36 is connected to the foot part 40. With the foot part 40, the spring wire 26' is connected to the grooves 42 at the bottom of the holster part 16. The spring wire 26' is tensioned between the grooves 42 such that it is kept there automatically. The lifting force achievable with the spring wire is exactly suitable for lifting the gas spray together with the inner frame out of the holster part, yet it does not bounce the gas spray so high that a danger of the gas spray dropping down from the holster part would exist.

According to an embodiment, reeling means can be disposed between the holster part of the gas spray holster and the inner frame. The reeling means can operate according to the principle of a ski lift ticket badge reel, for example, i.e. the holster part has a spring-operated reeling device which reels the wire inwards while the other end of the wire is fastened to the inner frame. With such a solution, a gas spray dropped from hands by the user is always kept with the user and is reeled back close to the user.

In an embodiment of the invention, the holster part of the gas spray holster is made of two parts connected with fasteners.

In an embodiment of the invention, the gas spray holster is made of a polymer blend or other material suitable for the purpose. For example, the gas spray holster can be made of fiberglass-reinforced nylon or a similar material.

Solutions deviating from the above description can also be contemplated within the scope of the invention. Hence, the gas spray holster can be made, for example, as a mirror of an embodiment of the gas spray holster according to the invention.
shown in the figures, in which case it is suitable for use on the other side of the belt.
CLAIMS

1. A gas spray holster (10) including the following:
   - a holster part (16) including belt fasteners (13),
   - an inner frame (15) for holding a standard gas spray
     (14) said inner frame (15) including a finger detent (18)
     for fingers,
   - mutual connecting means between the holster part (16)
     and the inner frame (15)
   characterized in that said mutual connecting means include
   - quick coupling means (17) with a release handle (20), and
   - a lifting spring (26) for improving lifting of the inner
     frame (15).

2. A gas spray holster according to claim 1, characterized in that the mutual connecting means further include a guard (12) articulated to the holster part (16) for protecting the release button (28) included in the gas spray (14).

3. A gas spray holster according to claim 1 or 2, characterized in that said quick coupling means (17) are spring-loaded.

4. A gas spray holster according to any of claims 1 - 3, characterized in that said lifting spring (26) is a spring wire (26') including an elastic part (36) that is parallel to the bottom of the holster part (16), forms an open loop and is set against the inner frame (15), vertical parts (38) perpendicular to the bottom of the holster part (16), and foot parts (40) parallel to the bottom of the holster part (16) for supporting the lifting spring (26) to the bottom of the holster part (16).

5. A gas spray holster according to any of claims 1 - 4, characterized in that the inner frame (15) includes a body part
(22) adapted for its inner size for fastening the gas spray (14) thereto.

6. A gas spray holster according to any of claims 1 - 5, characterized in that the gas spray holster (10) is adapted for standard gas sprays (14).

7. A gas spray holster according to any of claims 1 - 6, characterized in that said quick coupling means (17) include a release handle (20) articulated to the holster part (16) having a locking latch (32) adapted to a detent (34) in the body part (22) of the inner frame (15).

8. A gas spray holster according to any of claims 1 - 7, characterized in that in said holster part (16), the belt fastener (13) includes a fastening point (31), a belt loop part (23) for turning the gas spray holster (10) for 360° relative to the user's belt, and teeth (33) for locking the fastening point (31) and the belt loop part (23) relative to each other.

9. A gas spray holster according to any of claims 1 - 8, characterized in that its inner frame (15) and part of the holster part (16) have a groove-like finger detent (18) accommodating the forefinger for the finger grip for lifting and directing the inner frame (15) from the holster part (16).

10. A gas spray holster according to any of claims 1 - 9, characterized in that the body part (22) of said inner frame (15) has guide rails (29) for directing the inner frame (15) to the holster part (16).

11. A gas spray holster according to any of claims 1 - 10, characterized in that the gas spray holster (10) is made of a polymer blend.
12. A gas spray holster according to any of claims 1 - 11, characterized in that the gas spray holster (10) includes reeling means between the inner frame (15) and the holster part (16) adapted to reel the inner frame (15) connected to a wire back to the vicinity of the holster part (16).

13. A gas spray holster according to claim 12, characterized in that the reeling means include a wire connected between the inner frame (15) and the holster part (16) and a spring-operated reeling device fastened to the holster part.

14. A gas spray holster according to any of claims 1 - 13, characterized in that the guard (12) and the finger detent (18) have roughened surfaces for improving the grip.

15. A gas spray holster according to any of claims 1 - 14, characterized in that a double locking system is adapted in the gas spray holster (10) by means of the quick coupling means (17) and the guard (12) for locking the gas spray (14) in the gas spray holster (10).
A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
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)

IPC: F41H, A45F

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

SE, DK, FI, NO classes as above

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

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>US 5949338 A (MASI ET AL), 7 Sept 1999 (07.09.1999), column 3, line 46 - line 49;</td>
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<td>column 4, line 33 - line 38, figures 1,8</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

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Name and mailing address of the ISA/ Swedish Patent Office
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Facsimile No. +46 8 666 02 86

Authorized officer
Anders Tolli / JA A
Telephone No. +46 8 782 25 00

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