entanglement. Therefore, the following description provides a disclosure of the Weapon Accessory Power Distribution System in sufficient detail to understand the teachings and benefits of the Accessory Mounting Apparatus as used in this environment. The disclosed Accessory Mounting Apparatus includes contacts for electrically connecting to an accessory rail which provides powered contacts connected to a power source. However, the Accessory Mounting Apparatus need not be used exclusively for power-consuming accessories and can be used simply to provide a mechanical interconnection to an accessory to the accessory rail of a weapon, with the basic architecture and implementation of the Accessory Mounting Apparatus being delimited by the appended claims.

According to one aspect, there is provided a mounting apparatus for simultaneous mechanical and electrical attachment to a powered accessory rail, which extends along at least a portion of a length of a barrel of a weapon and which includes a plurality of slots formed along a length thereof and two outwardly-facing surfaces along opposite sides thereof, and which also has formed thereon a first electrical contact and a second electrical contact electrically connected to a power source for providing a first and a second electrical connection to the power source, wherein the powered accessory rail includes a switch formed thereon juxtaposed to the first and second electrical contacts for applying power from the power source to the first electrical contact when the switch is operated, comprising: a body, comprising: first and second electrical contacts formed on the bottom surface of the body to electrically contact the first and second electrical contacts of the powered accessory rail when the mounting apparatus is attached to the powered accessory rail, a feature formed on and protruding from the bottom surface of the body for engaging the switch formed on the powered accessory rail and operating the electrical switch when the mounting apparatus is attached to the powered accessory rail, an integral inwardly-facing surface having a profile that mates with a first of the outwardly-facing surfaces of the powered accessory rail, and at least one keying feature to align with a corresponding one of the slots in the accessory rail; a latching arm, pivotally connected to the body and having an inwardly-facing surface having a profile that mates with a second of the outwardly-facing surfaces of the powered accessory rail; and a lever, pivotally connected to the body and operable to force the inwardly-facing surface of the body and the latching arm into mechanical contact with respective outwardly-facing surfaces of the accessory rail.

According to another aspect, there is provided a mounting apparatus for simultaneous mechanical and electrical attachment to a powered accessory rail, which extends along at least a portion of a length of a barrel of a weapon and which includes a plurality of slots formed along a length thereof and two outwardly-facing surfaces along opposite sides thereof, and which also has formed thereon a first electrical contact and a second electrical contact electrically connected to a power source for providing a first and a second electrical connection to the power source, wherein the powered accessory rail includes a switch formed thereon juxtaposed to the first and second electrical contacts for applying power from the power source to the first electrical contact when the switch is operated, comprising: a body, comprising: first and second electrical contacts formed on the bottom surface of the body to electrically contact the first and second electrical contacts of the powered accessory rail when the mounting apparatus is attached to the powered accessory rail, a feature formed on and protruding from the bottom surface of the body for engaging the switch formed on the powered accessory rail and operating the electrical switch when the mounting apparatus is attached to the powered accessory rail, an integral inwardly-facing surface to mate with a first of the outwardly-facing surfaces of the powered accessory rail, and at least one keying feature to align with a corresponding one of the slots in the accessory rail; a latching arm, pivotally connected to the body at a site above the integral inwardly-facing surface, overlaying the top surface of the body, and having an inwardly-facing surface to mate with a second of the outwardly-facing surfaces of the powered accessory rail; and a lever, pivotally connected to the body and operable to force the inwardly-facing surface of the body and the latching arm into mechanical contact with respective outwardly-facing surfaces of the accessory rail.

BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1A – 1H are illustrations of various views of the Accessory Mounting Apparatus which provides mechanical interconnection and electrical interconnection of a Power-Consuming Accessory to the Powered Rail of a weapon;

Figures 2A and 2B are illustrations of the system architecture of a military style weapon equipped with a Weapon Accessory Power Distribution System;

Figures 3A and 3B are illustrations of a typical butt stock battery pack of the Weapon Accessory Power Distribution System;

Figures 4A – 4C are illustrations of the Power Distribution System which interconnects the Battery Pack to the Powered Rail in the Weapon Accessory Power Distribution System;

Figures 5A – 5C are illustrations of the Handguard assembly, including the Powered Rail, of the Weapon Accessory Power Distribution System;

Figures 6A and 6B are plan and perspective views, respectively, of two implementations of the Powered Rail, while Figure 6C is an exploded perspective view of the Powered Rail; and

Figures 7A – 7B illustrate the details of the Powered Rail electrical interconnection.

CLAIMS

What is claimed is:

1. A weapon accessory mounting apparatus for mechanical attachment to an accessory rail, which extends along at least a portion of a length of a barrel of said weapon and includes two outwardly-facing surfaces along opposite sides thereof, comprising:

a body which includes an inwardly-facing surface or profile to mate with a first of said outwardly-facing surfaces of said accessory rail;

a base plate attached to said body for attachment to an accessory;

a latching arm, pivotally connected to said body and having an inwardly-facing surface or profile to mate with a second of said outwardly-facing surfaces of said accessory rail; and

a lever, pivotally connected to said body and operable to force said inwardly-facing surface of said body and said latching arm into mechanical contact with respective outwardly-facing surfaces of said accessory rail.

Claims:

1. A mounting apparatus for simultaneous mechanical and electrical attachment to a powered accessory rail, which extends along at least a portion of a length of a barrel of a weapon and which includes a plurality of slots formed along a length thereof and two outwardly-facing surfaces along opposite sides thereof, and which also has formed thereon a first electrical contact and a second electrical contact electrically connected to a power source for providing a first and a second electrical connection to the power source, wherein the powered accessory rail includes a switch formed thereon juxtaposed to the first and second electrical contacts for applying power from the power source to the first electrical contact when the switch is operated, comprising:

a body, comprising:

first and second electrical contacts formed on the bottom surface of the body to electrically contact the first and second electrical contacts of the powered accessory rail when the mounting apparatus is attached to the powered accessory rail,

a feature formed on and protruding from the bottom surface of the body for engaging the switch formed on the powered accessory rail and operating the electrical switch when the mounting apparatus is attached to the powered accessory rail,

an integral inwardly-facing surface having a profile that mates with a first of the outwardly-facing surfaces of the powered accessory rail, and

at least one keying feature to align with a corresponding one of the slots in the accessory rail;

a latching arm, pivotally connected to the body and having an inwardly-facing surface having a profile that mates with a second of the outwardly-facing surfaces of the powered accessory rail; and

a lever, pivotally connected to the body and operable to force the inwardly-facing surface of the body and the latching arm into mechanical contact with respective outwardly-facing surfaces of the accessory rail.

2. The mounting apparatus of claim 1 wherein the latching arm is pivotally connected to the body at a site above the integral inwardly-facing surface and overlays the top surface of the body.

3. The mounting apparatus of claim 2, further comprising: a base plate attached to the top surface of the latching arm for attachment to a power consuming accessory.

4. The mounting apparatus of claim 1 wherein rotation of the lever about its pivotal connection to the body forces the latching arm and the integral inwardly-facing surface or profile of the body in a direction toward each other.

5. The mounting apparatus of claim 1 wherein the first and second electrical contacts of the powered accessory rail are formed in a slot and wherein attachment of the mounting apparatus on the powered rail simultaneously mechanically secures the mounting apparatus to the powered rail and electrically interconnects two electrical contacts on the mounting apparatus to the first and the second electrical contacts of the powered accessory rail.

6. A mounting apparatus for simultaneous mechanical and electrical attachment to a powered accessory rail, which extends along at least a portion of a length of a barrel of a weapon and which includes a plurality of slots formed along a length thereof and two outwardly-facing surfaces along opposite sides thereof, and which also has formed thereon a first electrical contact and a second electrical contact electrically connected to a power source for providing a first and a second electrical connection to the power source, wherein the powered accessory rail includes a switch formed thereon juxtaposed to the first and second electrical contacts for applying power from the power source to the first electrical contact when the switch is operated, comprising:

a body, comprising:

first and second electrical contacts formed on the bottom surface of the body to electrically contact the first and second electrical contacts of the powered accessory rail when the mounting apparatus is attached to the powered accessory rail,

a feature formed on and protruding from the bottom surface of the body for engaging the switch formed on the powered accessory rail and operating the electrical switch when the mounting apparatus is attached to the powered accessory rail,

an integral inwardly-facing surface to mate with a first of the outwardly-facing surfaces of the powered accessory rail, and at least one keying feature to align with a corresponding one of the slots in the accessory rail;

a latching arm, pivotally connected to the body at a site above the integral inwardly-facing surface, overlaying the top surface of the body, and having an inwardly-facing surface to mate with a second of the outwardly-facing surfaces of the powered accessory rail; and

a lever, pivotally connected to the body and operable to force the inwardly-facing surface of the body and the latching arm into mechanical contact with respective outwardly-facing surfaces of the accessory rail.

7. The mounting apparatus of claim 6, further comprising: a base plate attached to the top surface of the latching arm for attachment to a power consuming accessory.

8. The mounting apparatus of claim 6 wherein rotation of the lever about its pivotal connection to the body forces the latching arm and the integral inwardly-facing surface or profile of the body in a direction toward each other.

9. The mounting apparatus of claim 6 wherein the first and second electrical contacts of the powered accessory rail are formed in a slot and wherein attachment of the mounting apparatus on the powered rail simultaneously mechanically secures the mounting apparatus to the powered rail and electrically interconnects two electrical contacts on the mounting apparatus to the first and the second electrical contacts of the powered accessory rail.