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(54) **ERGONOMIC PISTOL GRIP FOR RIFLES**

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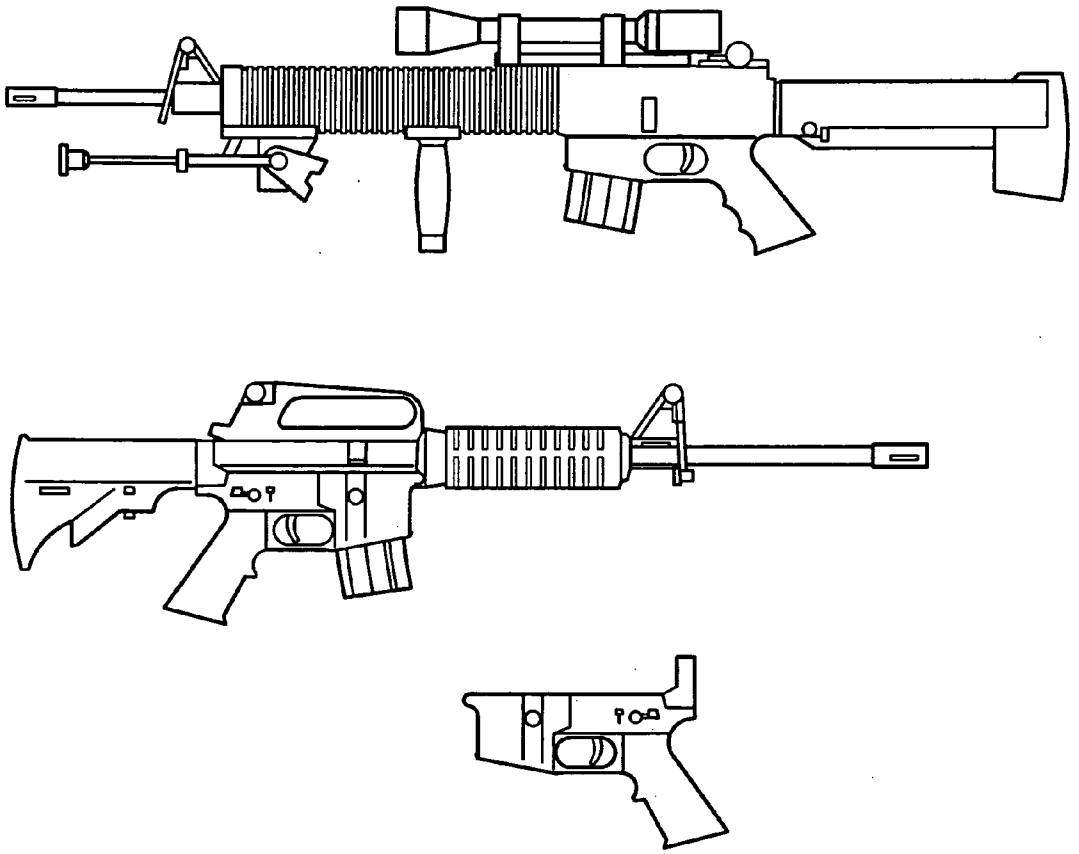
(57) **ABSTRACT**

An angled pistol grip for a user's trigger hand , mounted on an automatic or semiautomatic rifle. Said pistol grip oriented asymmetrically from the centerline of the rifle body thereby reducing the stress on the shooter's wrist of the trigger hand said pistol grip while firing. Thus allowing the shooter to correctly position the weapon, relative to the shooter's body, for accurate aiming.



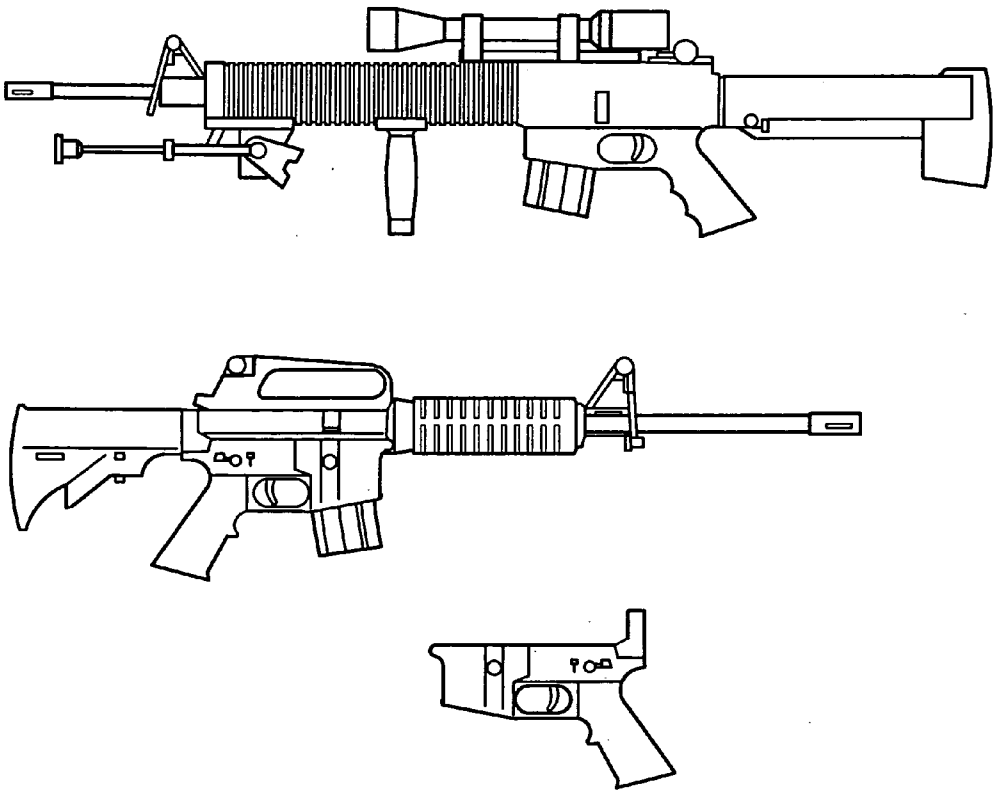


FIG.1

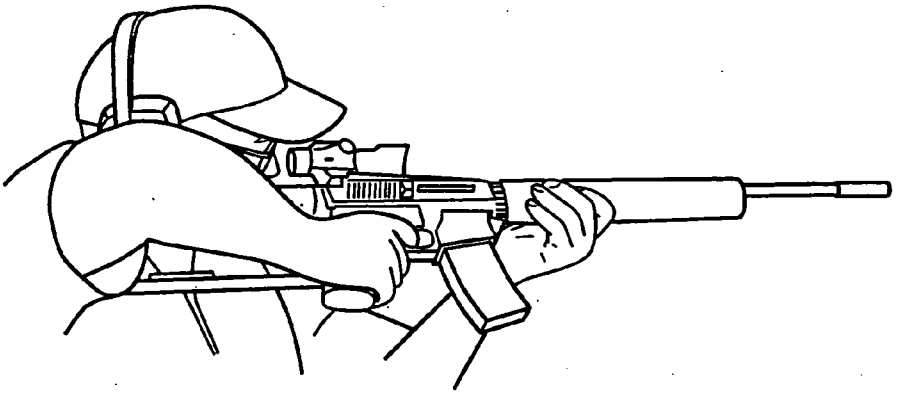


FIG.2

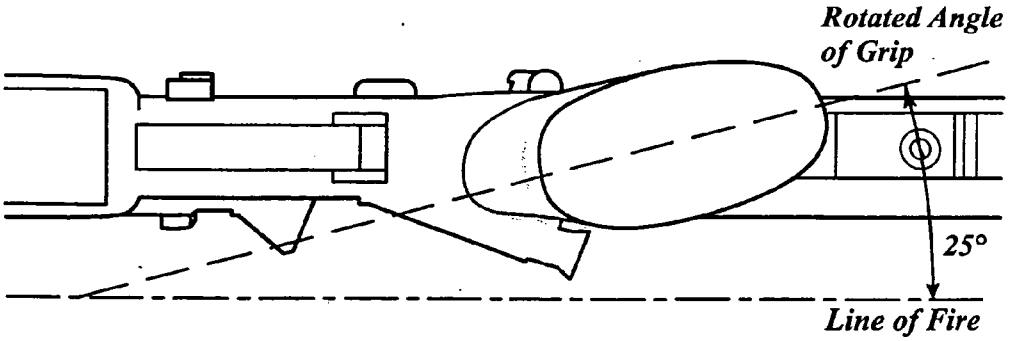


FIG.3

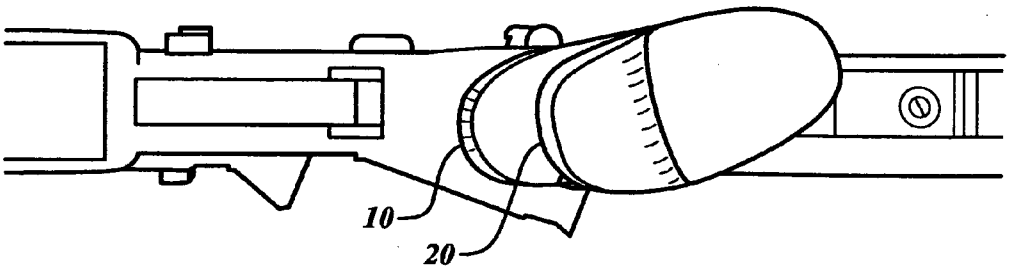


FIG.4

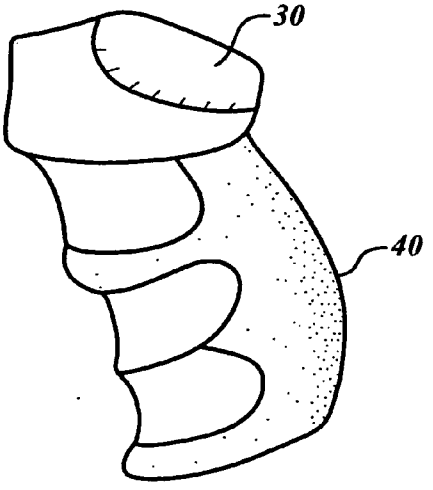


FIG.5

ERGONOMIC PISTOL GRIP FOR RIFLES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application Ser. No. 12/930,820, filed Jan. 18, 2011 which claims the benefit of U.S. Provisional Application No. 61/336,258, filed Jan. 19, 2010.

BACKGROUND

[0002] 1. Field

[0003] This disclosure relates to a ergonomically designed trigger hand pistol grip that may be used on the AR-15® made by Colt Industries , and on the numerous AR-15 clones presently sold. Other models of semi-automatic and fully automatic rifles using a pistol grip for the shooters trigger hand will also find this grip useful.

[0004] 2. Background

[0005] Rifles using a pistol grip have been traditionally designed with the grip features, such as the finger groves of the grip, symmetrically aligned with the body of the rifle. Therefore the finger pressure surfaces of the grip are aligned in the direction of the barrel. Other grip features such as the cheek surfaces and thumb rest are, as a result, correlated with the finger pressure surfaces. Pistol grips are often used on semi and full automatic weapons because, among other reasons, the rifle stock is often adjustable. On a shortened stock, control of the rifle is managed by gripping the pistol type grip with the hand that pulls the trigger. The pistol grip configuration also allows control of the rifle when the rifle is fired from a position where the stock is not abutting the user's shoulder. An example is when the weapon is fired from the hip.

OBJECTS AND ADVANTAGES

[0006] Accordingly several objects and advantages of the present invention are: allowing the user to reduce the angle of their hand relative to the forearm when aiming and/or firing the rifle. Using the standard pistol grip configuration, the acute angle (approx. 40 degrees forearm to hand) for proper rifle handling and aiming puts an undue strain and fatigue on the wrist, hand and forearm. The standard pistol grip is rectangular shaped, with slightly rounded corners, with a thickness designed to not exceed the thickness of the body of the rifle. The forward facing surface of the grip is meant to be gripped by the fingers of the trigger hand. If grip finger grooves are present they are also facing directly forward. As such when held the wrist angle is not optimal. Carpal tunnel occurs when there is inordinate and repetitive stress on a wrist held in a non-optimal position, thereby putting pressure on the median nerve at the point that the nerve passes through the wrist. The median nerve supplies sensation to the thumb side of the palm, and to the thumb, index finger, middle finger, and the thumb side of the ring finger. The median nerve also helps with movement to part of the hand.

[0007] The area where the nerve enters the hand is called the carpal tunnel. Since the passageway is stiff, any swelling in this area can put pressure on the nerve. This may also be called entrapment of the nerve. Injury to the wrist area can cause swelling of the tissues and carpal tunnel syndrome. This type of injury may be caused by sports such as racquetball and handball, or occur during sewing, typing, driving, assembly-line work, painting, writing, use of tools (especially hand tools or tools that vibrate). Firing a semi-automatic or automatic weapon with the trigger hand wrist cocked at an acute angle, especially upon recoil, may cause such inordinate stress. The disclosed grip design reduces the non-optimal angle of the wrist, thereby reducing the stress, fatigue, and potential Carpal tunnel of the hand using the pistol grip of the rifle. This wrist angle reduction is a result of rotating the pistol grip position from its symmetrical position to the rifle body to a new position asymmetrical to the line of the rifle body. The term asymmetrical in this context means the grip finger grooves, if present, and other hand and finger locating features are not aligned with long axis of the weapon but instead are rotated as shown in FIG. **3**. The range of the pistol grip rotation contemplated by this disclosed grip can be from 3 degrees to 45 degrees, preferably from 15 degrees to 35 degrees and most preferably from 20 degrees to 30 degrees. Finger grooves, if present, would number a maximum of three. Since the shooter's index finger is on the trigger then inherently no more than three fingers would use grooves. Rotating the grip asymmetrically also rotates other grip features. These features are a thumb rest surface and a palm cheek area of the grip.

[0008] In another embodiment of the disclosed grip there are no finger grooves present on the grip, there is just a finger pressure area that is normally, on the traditional grip design, facing forward. The present design skews the finger pressure area to a new asymmetrical position so the shooters hand, that is operating the trigger, is at more ergonomically correct position.

[0009] The term rotated asymmetrically from being aligned to the centerline of said rifle deals with the fact that a standard grip has all the gripping features, such as finger grooves if present, facing in the same direction as the barrel and all the other associated features such as the palm cheek and the thumb rest oriented as dictated by the finger groove orientation.

[0010] Since the index finger is in a standard orientation when placed on the trigger of the weapon then on one embodiment implementing the disclosed grip is having the middle finger, groove **10** of FIG. **4**, may offset a little to the left of the barrel centerline (for a right handed shooter using the right hand as the trigger hand). The ring finger may be offset a little more to the left and the pinky finger may be offset the most. The other grip features (palm cheek and thumb rest) may also be offset (rotated) for the comfort of the shooter. Another implementation may leave the middle finger groove in the standard location and offset (rotate) the other finger grooves to the left. If the user prefers, then the middle finger groove may also be slightly rotated. Pistol grips, behind the trigger guard, for auto and semi-auto rifles may include 3 finger grooves, these include grooves for the middle finger, the ring finger and the little (pinkie) finger. Since the index finger is placed on the trigger, there is a maximum of 3 finger grooves needed. Another implementation may have two grooves rotated for placement of the fingers. Another implementation may not have any grooves for the fingers but still have the gripping surfaces of the grip rotated to reduce the angle from the wrist to the forearm.

SUMMARY

[0011] In accordance with the present invention, an angled pistol grip behind the trigger, for use in a semiautomatic or automatic rifle, reduces the stress on the shooters wrist while

firing and allows the shooter to position the weapon, relative to the shooter's body, for accurate aiming.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The disclosed grip is further described in connection with the accompanying drawings, in which:

[0013] FIG. **1** shows two semi-automatic rifles with standard pistol grips.

[0014] FIG. **2** shows firing using a standard pistol grip.

[0015] FIG. **3** illustrates the improved grip rotated to reduce the user's wrist angle.

[0016] FIG. **4** shows the improved grip with each finger grove individually rotated to a different degree.

[0017] FIG. **5** shows the grip with a thumb rest and a palm cheek.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] FIG. **1** demonstrates the existing pistol grips on semi-automatic rifles. The pistol grips extending down behind the trigger are symmetrical about the line defining the body of the rifle and are not rotated.

[0019] FIG. **2** illustrates the normal shooting position using semi-automatic rifle with a pistol grip. The shooter shows the best stance for accuracy with his elbow high and forearm at approximately a 90 degree angle. In this position the wrist is in a highly cocked position that may generate high stresses while firing leading to possible carpal tunnel syndrome.

[0020] FIG. **3** shows a under view of the asymmetrical grip rotated counterclockwise from its standard position where the grip features are aligned with the rifle body, when viewed from below, to relieve the wrist stress on a right handed shooter. Left handed shooters would use a grip with features rotated in an opposite direction.

[0021] FIG. **4** shows the pistol grip from the underside wherein the rotation increases as the grip descends. Finger position **20** is rotated further than finger position **10**.

[0022] FIG. **5** shows a typical grip with a thumb rest **30** and a palm cheek **40**.

Other Embodiments

[0023] In an alternative embodiment the angle of rotation of the pistol grip from the body line of the rifle is adjustable rather than fixed. The shooter can evaluate a number of different rotations to find one most suitable for that individual. Once the most suitable rotation is determined the user can lock that configuration in. In another alternative the user can select a fixed pistol grip matching the rotation found most suitable while evaluating different rotations and mount that particular fixed pistol grip on the rifle. Another embodiment is a grip that is rotationally adjustable through a detent or similar mechanism and then locked down when an acceptable rotation is found.

[0024] Another embodiment may be to make the grip out of a material that is flexible when initially fabricated but may then be made more solid through heat or UV light. The user then customizes the configuration of the grip angle prior to making the grip fixed to that angle. The user may also adjust the distance between the finger grooves and even the depth of the grooves. Once the hand and finger features are set to the user's requirements those features are made permanent. This technology is similar to that of custom molded ski boots.

[0025] The use of the term rifle does not mean to be exclusive of other automatic or semi-automatic weapons that are shorter than the traditional length associated with the term rifle. For example the present invention may be used on the short pistol called the MP5K™, an automatic weapon from Heckler&Koch.

[0026] Therefore, although the invention has been described as setting forth specific embodiments thereof, the invention is not limited thereto. Changes in the details may be made within the spirit and the scope of the invention, said spirit and scope to be construed broadly and not to be limited except by the character of the claims appended hereto.

We claim:

1. A pistol grip mounted to an automatic or semi-automatic rifle, for accepting holding pressure by user's trigger hand, with said pistol grip having hand locating features, with at least one of said pistol hand locating features rotated asymmetrically from an alignment parallel to said rifles barrel.

2. The pistol grip according to claim **1** wherein the said piston grip features rotated asymmetrically is at least one finger locating feature.

3. The pistol grip according to claim **1** wherein the said pistol grip features rotated asymmetrically is at least one hand locating feature.

4. The pistol grip according to claim **3** wherein the at least one hand locating feature rotated asymmetrically is that of a palm cheek.

5. The pistol grip according to claim **3** wherein the at least one hand locating feature rotated asymmetrically is that of a thumb rest.

6. A pistol grip mounted to an automatic or semi-automatic rifle, with said pistol grip having features, with at least one of said features rotated asymmetrically from being aligned to a centerline of said rifle, and with at least another of said features rotated at a different angle depending on the feature.

7. The pistol grip according to claim **6** wherein said pistol grip features are a maximum of three finger grooves.

8. The pistol grip according to claim **7** wherein one of said multiple finger grooves is a grove for a middle finger and wherein one of said multiple finger grooves is a grove for a ring finger.

9. The pistol grip according to claim **8** wherein the ring finger groove is rotated further from the centerline of the rifle than the middle finger groove.

10. The pistol grip according to claim **7** wherein one of said multiple finger grooves is a grove for a little (pinkie) finger.

11. The pistol grip according to claim **10** wherein the pinkie finger groove is rotated further from the centerline of the rifle than the ring finger groove.

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