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Criswell

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(54) **CHEEK SUPPORT APPARATUS**

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(51) **Int. Cl.**
F41C 23/14 (2006.01)

(52) **U.S. Cl.** **42/73**

(58) **Field of Classification Search** 42/71.01, 42/72, 73, 74; D22/108, 111
See application file for complete search history.

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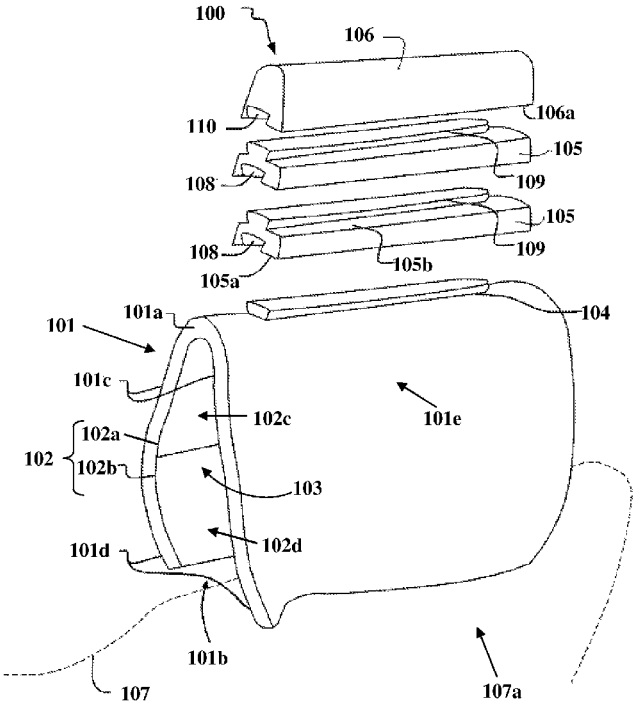
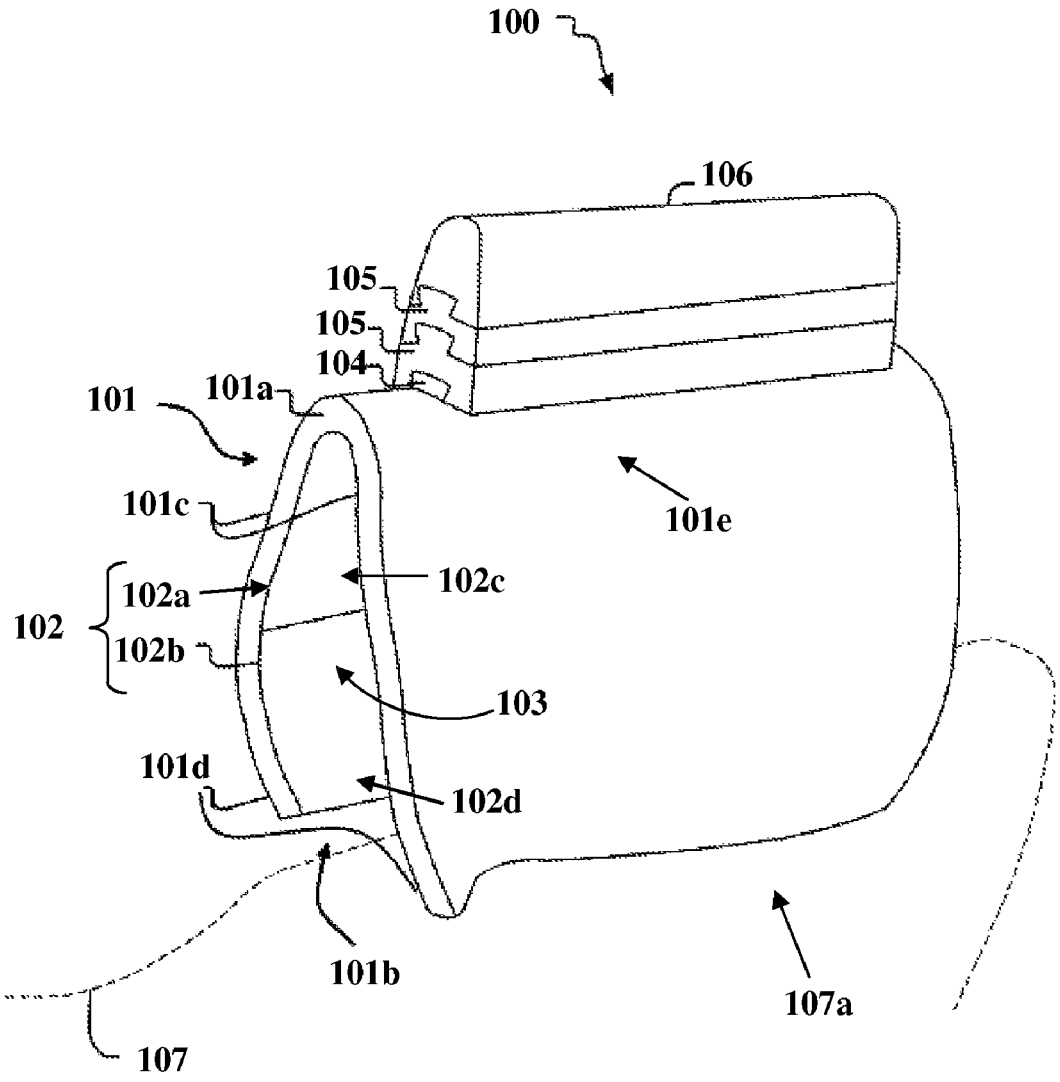
(57) **ABSTRACT**

A cheek support apparatus comprising a generally inverted U-shaped shell member, a base member, and a cheek supporting member is provided for a firearm. The shell member made of a form fitting material, for example, a thermoplastic material, is selectively configured with different coefficients of friction to enable rigid contact of the shell member to a stock of the firearm. The shell member comprising an inner frictional surface defines an opening for accommodating the stock of the firearm. The base member is rigidly attached to a closed upper end of the shell member. In an embodiment, one or more shim members are removably attached on the base member for adjustably positioning the cheek supporting member on the base member. The cheek supporting member is removably attached on one or more of the shim members or the base member for supporting a user's cheek, for example, during recoil of the firearm.

15 Claims, 11 Drawing Sheets

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105
105
104
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102b
102c
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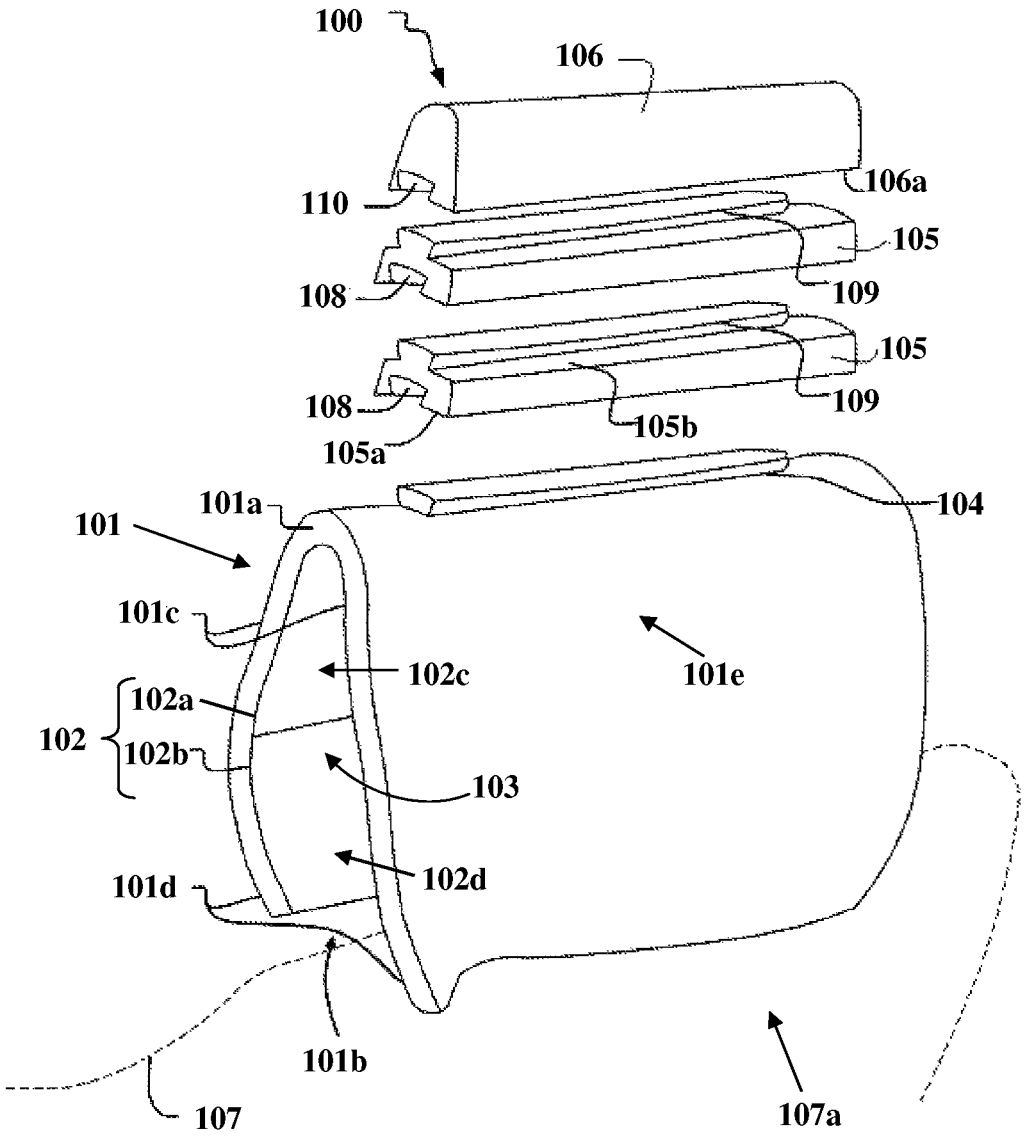
101d
102d
101b
107a
107

FIG. 1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105b
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103
101d
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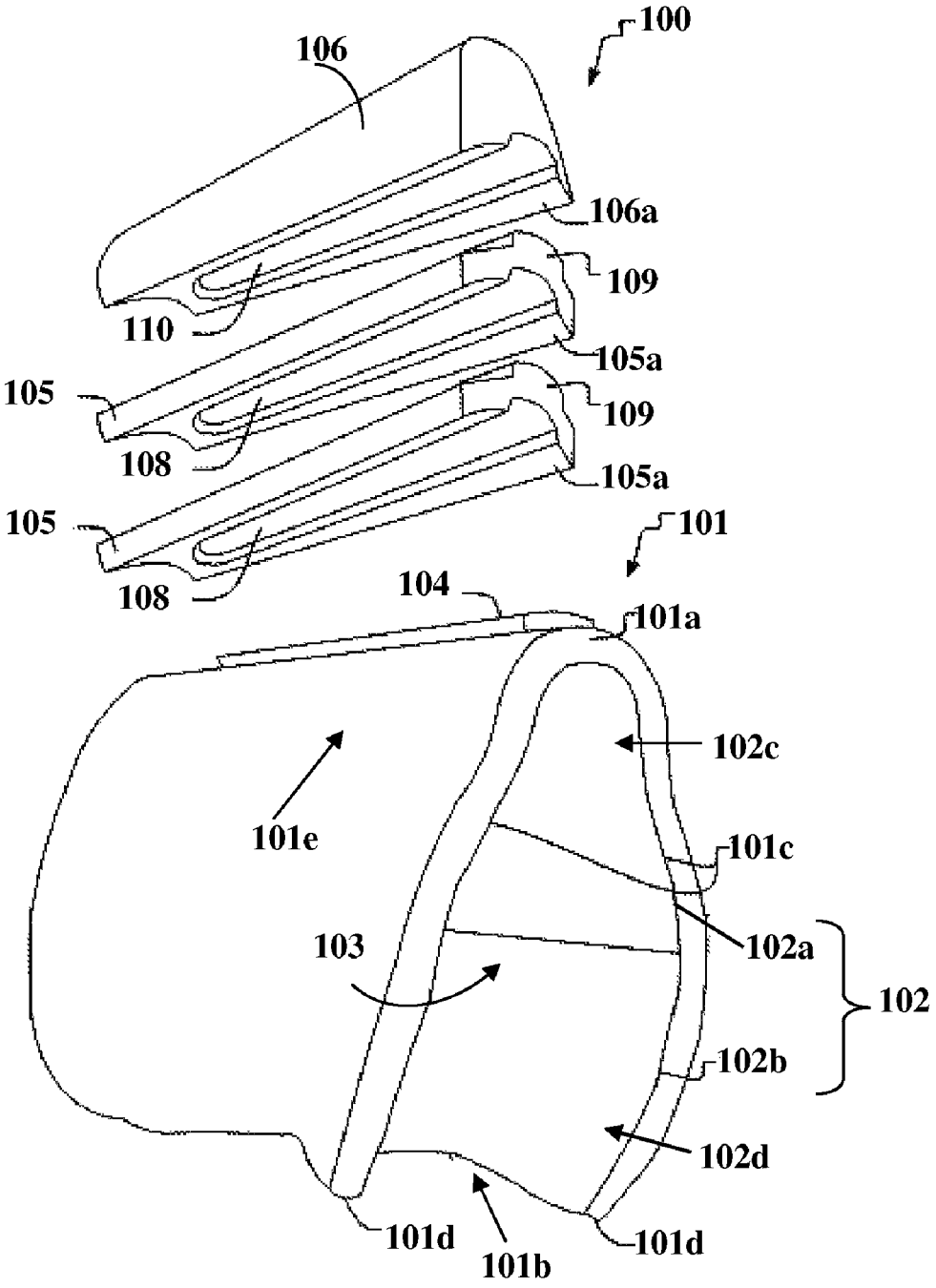
101b
107
107a

FIG. 2A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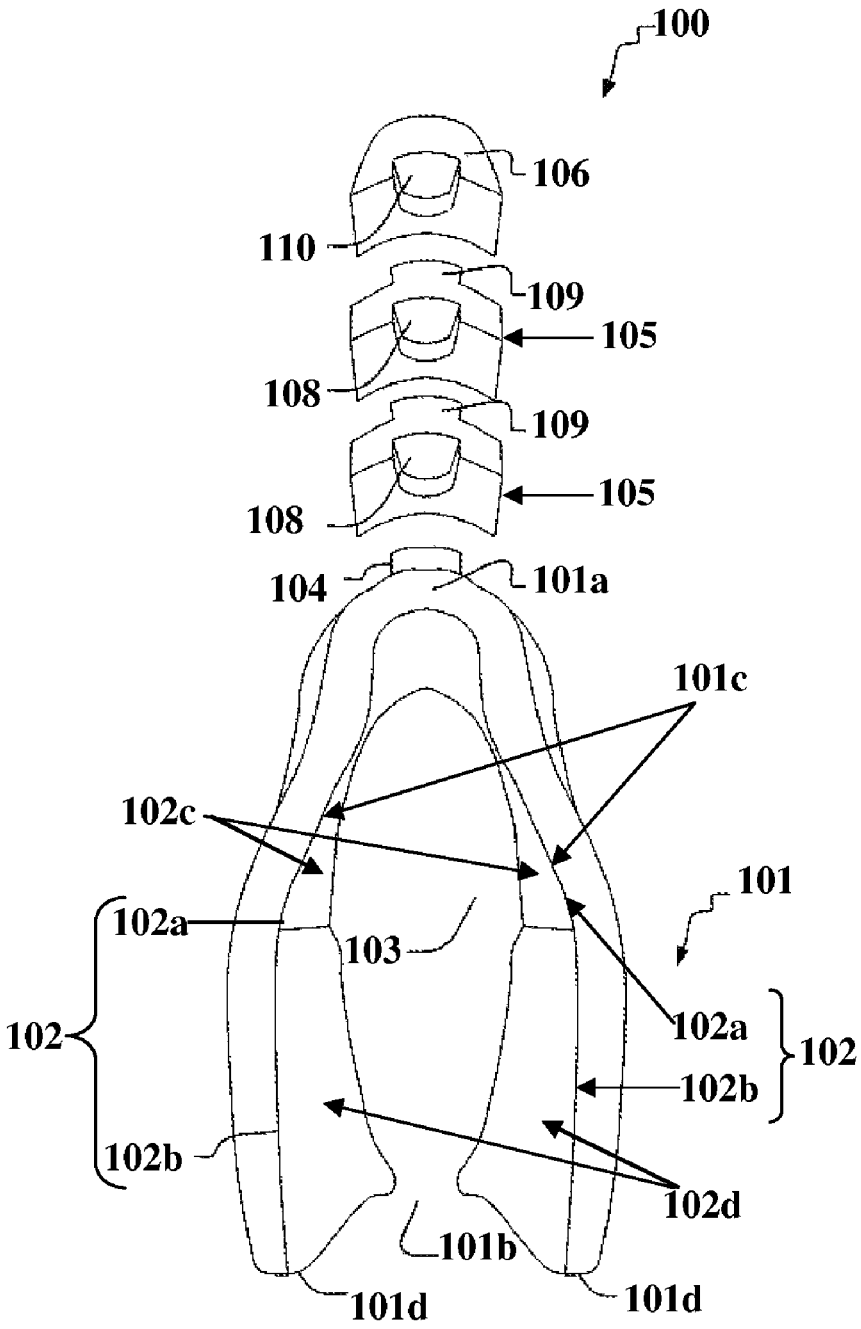
102
102b
102d
101d
101b
101d

FIG. 2B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104
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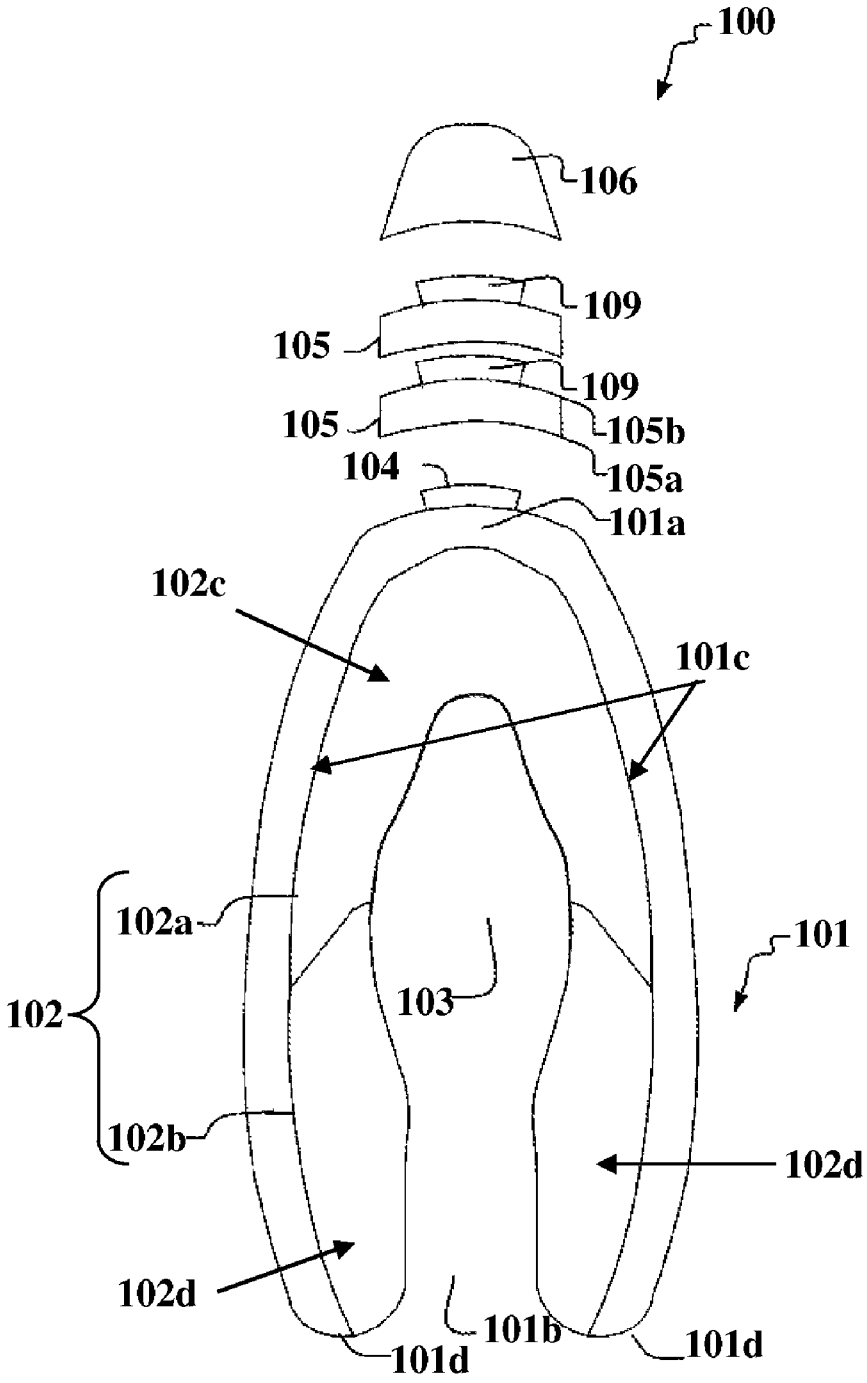
102b
102d
101b
101d
101d

FIG. 3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106
109
105
109
105
105b
104
105a
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102c
101c
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102
103
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102d
102d
101b
101d
101d

FIG. 4

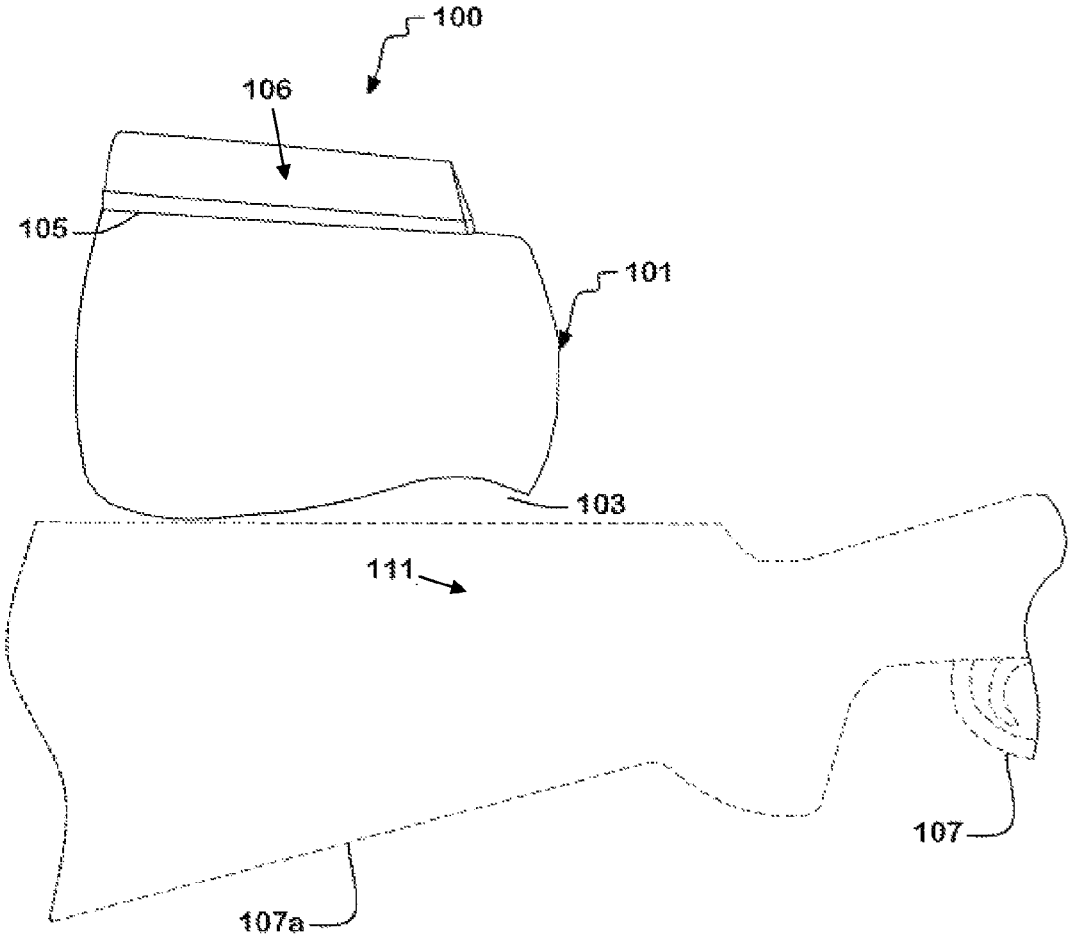

FIG. 5A

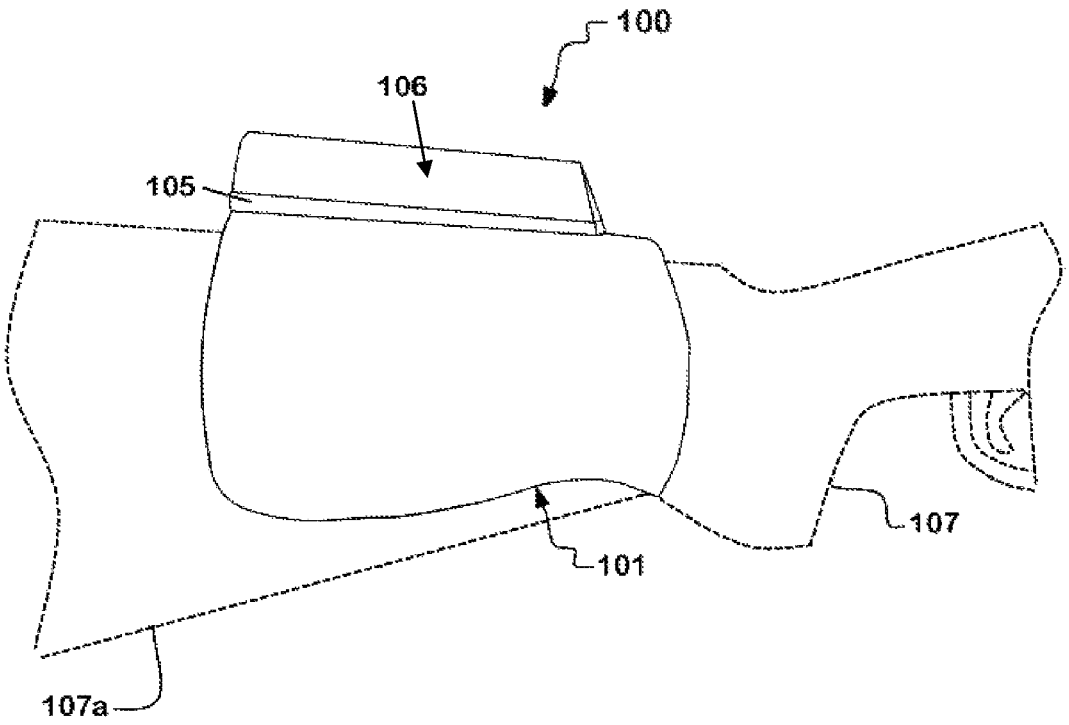

FIG. 5B

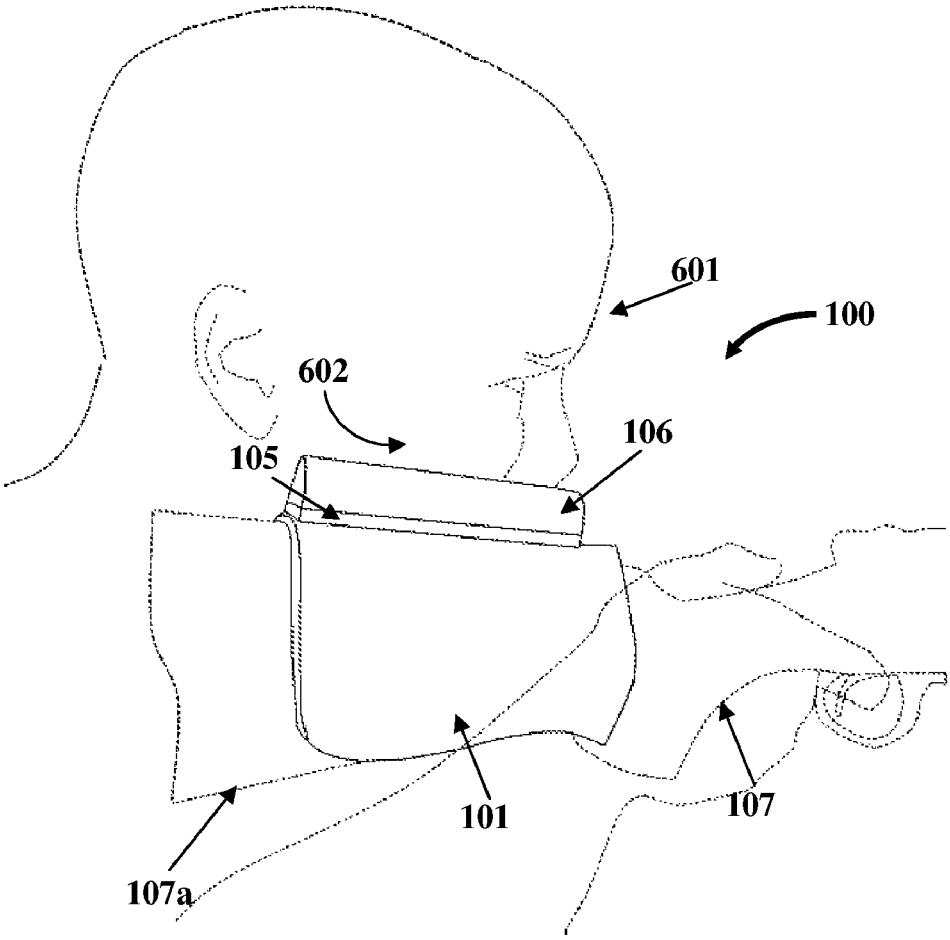

FIG. 6

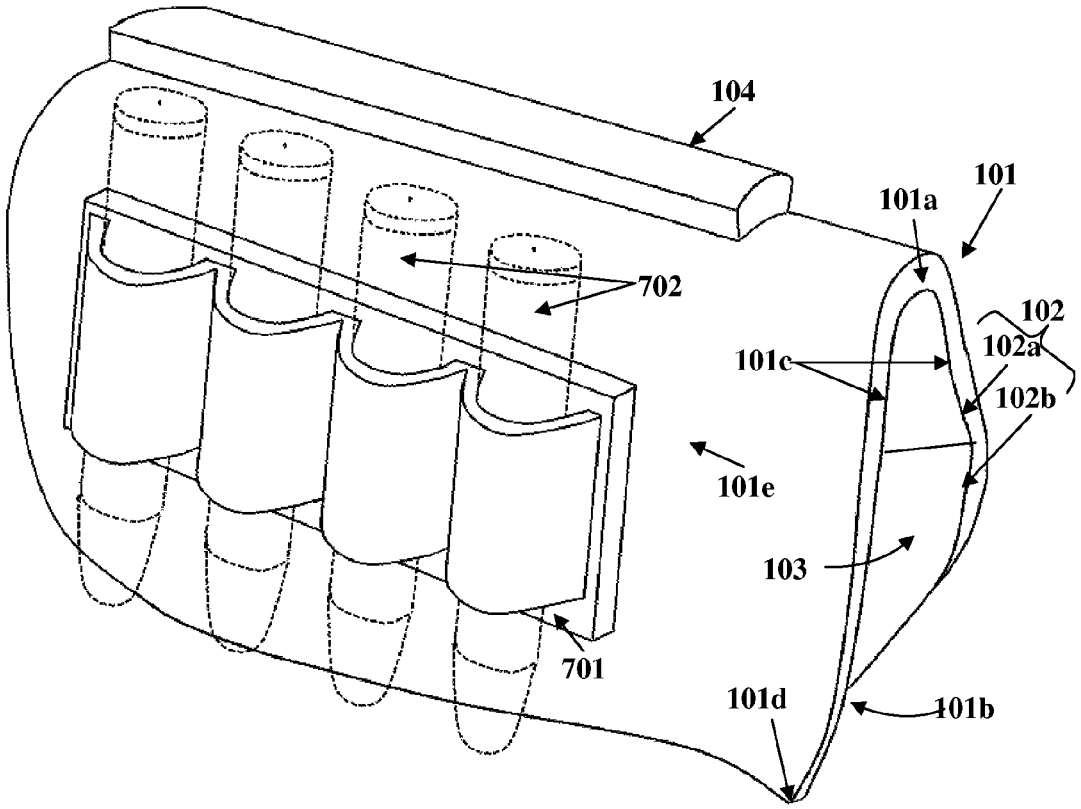

FIG. 7

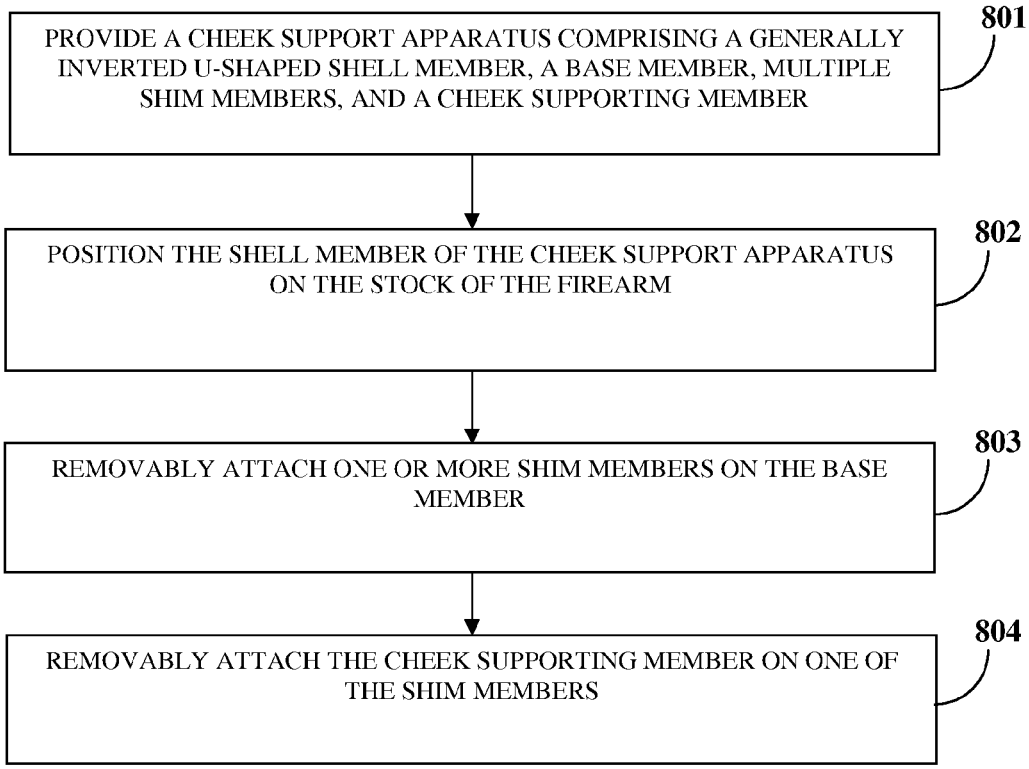
PROVIDE A CHEEK SUPPORT APPARATUS COMPRISING A GENERALLY INVERTED U-SHAPED SHELL MEMBER, A BASE MEMBER, MULTIPLE SHIM MEMBERS, AND A CHEEK SUPPORTING MEMBER
801
POSITION THE SHELL MEMBER OF THE CHEEK SUPPORT APPARATUS ON THE STOCK OF THE FIREARM
802
REMOVABLY ATTACH ONE OR MORE SHIM MEMBERS ON THE BASE MEMBER
803
REMOVABLY ATTACH THE CHEEK SUPPORTING MEMBER ON ONE OF THE SHIM MEMBERS
804

FIG. 8

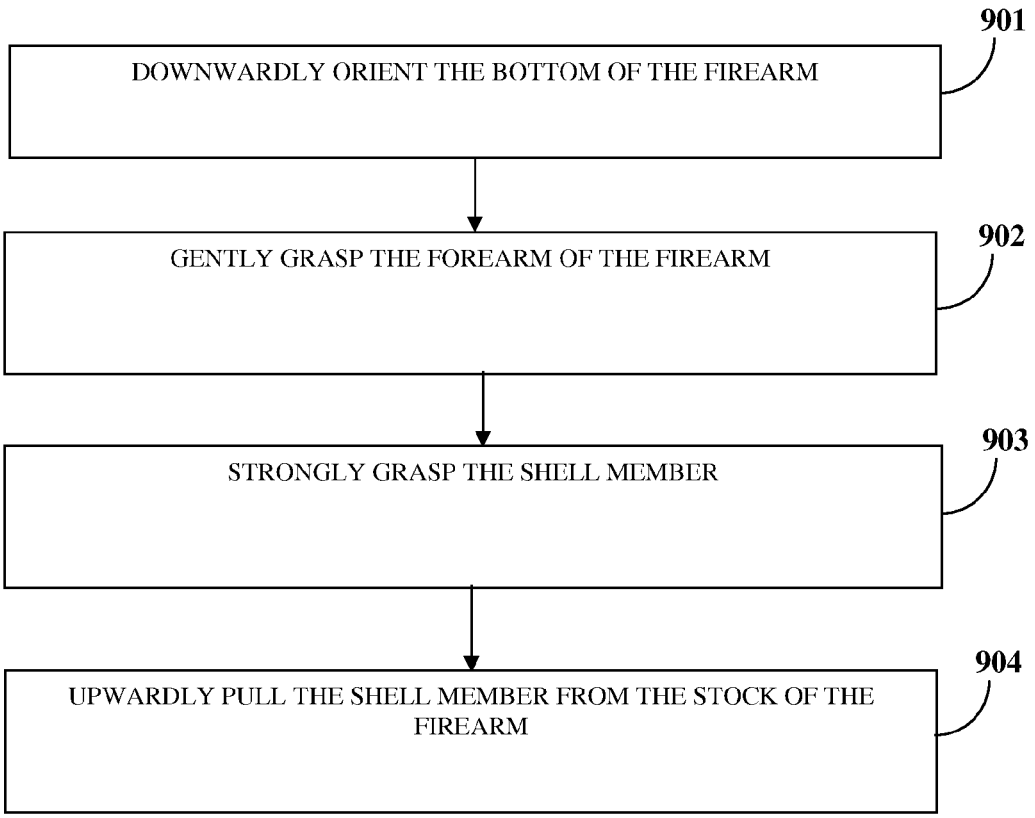
901
DOWNWARDLY ORIENT THE BOTTOM OF THE FIREARM
902
GENTLY GRASP THE FOREARM OF THE FIREARM
903
STRONGLY GRASP THE SHELL MEMBER
904
UPWARDLY PULL THE SHELL MEMBER FROM THE STOCK OF THE FIREARM

FIG. 9

CHEEK SUPPORT APPARATUS

BACKGROUND

A conventional cheek piece used in firearms today is attached to a stock of a rifle, for example, using adhesives, straps, laces, hook and loop fasteners, threaded fasteners such as screws, bolts, etc. These modes of attachment have inherent drawbacks, for example, poor gripping contact between the cheek piece and the stock of the rifle, loosening out of the cheek piece from the stock of the rifle, etc., during firing due to vibrations and other factors. The loosening out of the cheek piece from the stock during firing distracts the user, which results in the user missing a target. The loosening out of the cheek piece from the stock interferes with the rifle's mechanical operation. Moreover, the stock may need to be modified for attaching conventional cheek pieces, which reduces the value of the rifle.

In order to shoot accurately, a user must hold the rifle the same way every time and therefore needs to hold the user's eye at a particular height that allows the user to see through the center of the riflescope every time the user fires the rifle. In order to control the recoil of the rifle, the user must rest a cheek on an area of the stock of the rifle called a comb. To simultaneously control recoil and to obtain proper cheek support, the rifle's comb must be positioned at the correct height. Most often, the height of the comb required to control recoil during firing and to see through the riflescope is significantly higher than the existing rifle's comb height.

Moreover, the barrel of a rifle must be cleaned after firing. The user typically cleans the barrel of the rifle from a breech or a chamber end of the barrel using a cleaning rod. The need to accommodate the cleaning rod limits the height of the rifle's comb. If the comb is too high, the cleaning rod cannot be inserted into the breech end of the barrel.

Since the height of the comb is limited by the need to clean the rifle but the user needs the rifle's comb to be of a specific height that is higher than that allowed by the rifle's comb, there is a need for a cheek support apparatus that can be adjustably positioned to meet the height requirements.

Furthermore, loading and unloading of a conventional cheek piece on the rifle's stock is time consuming, which proves to be a major drawback in times of emergencies. Frequent installation and removal of the conventional cheek piece leads to deterioration in the surface finish of the rifle's stock, which further reduces the value of the rifle.

Hence, there is a long felt but unresolved need for a portable, easily installable and uninstallable cheek support apparatus that grips the stock of any firearm firmly, and that can be adjustably positioned to meet height requirements during cleaning and firing of the firearm.

SUMMARY OF THE INVENTION

This summary is provided to introduce a selection of concepts in a simplified form that are further described in the detailed description of the invention. This summary is not intended to identify key or essential inventive concepts of the claimed subject matter, nor is it intended for determining the scope of the claimed subject matter.

The cheek support apparatus disclosed herein addresses the above stated need for a portable, easily installable and uninstallable apparatus that grips a stock of any firearm firmly and that can be adjustably positioned to meet height requirements during cleaning and firing of the firearm. The cheek support apparatus disclosed herein comprises a generally inverted U-shaped shell member having a closed upper end and an open lower end, a base member, and a cheek supporting member.

The generally inverted U-shaped shell member is made of a form fitting material, for example, a thermoplastic material, configured to conform to contours of a stock of a firearm. The generally inverted U-shaped shell member is herein referred to as a "shell member". The shell member comprises an inner frictional surface. The inner frictional surface of the shell member defines an opening between the closed upper end and the open lower end of the shell member for accommodating the stock of the firearm. The inner frictional surface is selectively configured with different coefficients of friction to enable a rigid contact of the shell member to the stock of the firearm. The inner frictional surface of the shell member rigidly contacts the stock of the firearm and restricts movement of the shell member on the stock of the firearm.

In an embodiment, the inner frictional surface comprises a first section and second sections. The first section proximally extends from the open lower end of the shell member on opposing sides of the shell member towards the closed upper end of the shell member. The first section is made of a high friction compressible material, for example, rubber, polyurethane foam, etc., which maximizes resistance to the cheek support apparatus' forward movement relative to the stock of the firearm during recoil of the firearm. Each of the second sections extends from the open lower end on the opposing sides of the shell member towards the first section. Each of the second sections is made of a low friction material, for example, a soft, wear-resistant textile material. The low friction material minimizes wear of the cheek support apparatus on the stock due to abrasion and makes the installation of the cheek support apparatus on the stock easier.

The base member is rigidly attached on the closed upper end of the shell member. In an embodiment, the cheek support apparatus disclosed herein further comprises one or more shim members removably attached on the base member for adjustably positioning the cheek supporting member on the base member. In an embodiment, each of the shim members comprises a slot and a key member. The slot of each of the shim members longitudinally extends along a lower surface of each of the shim members. The key member of each of the shim members extends along an upper surface of each of the shim members. The slot of one of the shim members is configured to engageably connect to the base member. The key member of one of the shim members is configured to engageably connect to the slot of another one of the shim members. The key member of one of the shim members is also configured to engageably connect to a slot configured on the cheek supporting member. The slot configured on the cheek supporting member longitudinally extends along a base of the cheek supporting member.

In an embodiment, the base member is configured as a key member that engageably connects to the slot of one of the shim members or the slot configured on the cheek supporting member. If the user achieves a comfortable height without the shim members, the cheek supporting member can be directly connected to the base member. The cheek supporting member is removably attached on one of the shim members or directly on the base member for supporting a user's cheek during recoil of the firearm. The slot of the cheek supporting member is configured to engageably connect to the key member of one of the shim members or to the base member. In another embodiment, one or more auxiliary elements are detachably

attached on the cheek support apparatus for accommodating multiple items associated with the firearm.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing summary, as well as the following detailed description of the invention, is better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, exemplary constructions of the invention are shown in the drawings. However, the invention is not limited to the specific components and methods disclosed herein.

FIG. **1** exemplarily illustrates a perspective view of a cheek support apparatus for a firearm.

FIGS. **2**A-**2**B exemplarily illustrate perspective exploded views of the cheek support apparatus.

FIG. **3** exemplarily illustrates a front orthogonal view of the cheek support apparatus.

FIG. **4** exemplarily illustrates a rear orthogonal view of the cheek support apparatus.

FIGS. **5**A-**5**B exemplarily illustrate installation of the cheek support apparatus on a stock of a firearm.

FIG. **6** exemplarily illustrates a position of a user with a cheek resting against a cheek supporting member of the cheek support apparatus.

FIG. **7** exemplarily illustrates an auxiliary element detachably attached on the cheek support apparatus for accommodating multiple items associated with a firearm.

FIG. **8** illustrates a method for detachably attaching the cheek support apparatus on a stock of a firearm.

FIG. **9** exemplarily illustrates a method for removing the cheek support apparatus from the stock of the firearm.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** exemplarily illustrates a perspective view of a cheek support apparatus **100** for a firearm **107**. As exemplarily illustrated in FIG. **1**, the cheek support apparatus **100** disclosed herein comprises a generally inverted U-shaped shell member **101** having a closed upper end **101***a* and an open lower end **101***b*, a base member **104**, one or more shim members **105**, and a cheek supporting member **106**. The generally inverted U-shaped shell member **101** is herein referred to as a "shell member". The shell member **101** is made of a form fitting material configured to conform to contours of a stock **107***a* of a firearm **107**. As used herein, the term "firearm" refers to any device used for projecting one or more projectiles at a high velocity. The firearm **107** is, for example, a rifle, a shotgun, a carbine, a crossbow, etc. The form fitting material of the shell member **101** is a flexible and springy material, for example, a thermoplastic material manufactured by Kydex® LLC, etc. The shell member **101** is shaped to conform to each of the contours of the stock **107***a* of the firearm **107**. The flexibility or springiness of the shell member **101** allows the lower edges **101***d* of the shell member **101** to move apart far enough to allow installation of the cheek support apparatus **100** on the stock **107***a* of the firearm **107**. After the cheek support apparatus **100** is installed on the stock **107***a* of the firearm **107**, the shape and the springiness of the material of the shell member **101** allows the shell member **101** to act as a spring clamp that rigidly clamps to the stock **107***a* of the firearm **107**.

The shell member **101** comprises an inner frictional surface **102** that defines an opening **103** between the closed upper end **101***a* and the open lower end **101***b* of the shell member **101** for accommodating the stock **107***a* of the firearm **107**. The inner frictional surface **102** is selectively configured with different coefficients of friction to enable rigid contact of the shell member **101** to the stock **107***a* of the firearm **107**. The inner frictional surface **102** of the shell member **101** rigidly contacts the stock **107***a* of the firearm **107** and restricts movement of the shell member **101** on the stock **107***a* of the firearm **107**.

The inner frictional surface **102** comprises a first section **102***a* and second sections **102***b*. The first section **102***a* proximally extends from the open lower end **101***b* on opposing sides **101***c* of the shell member **101** towards the closed upper end **101***a* of the shell member **101**. For example, the first section **102***a* extends a short length away from the lower edges **101***d* of the shell member **101**. The first section **102***a* of the inner frictional surface **102** is made of a high friction compressible material **102***c*, for example, rubber, polyurethane foam, etc. The high friction compressible material **102***c* of the first section **102***a* of the inner frictional surface **102** is compressed by a clamping force of the shell member **101**. The compressibility of the high friction compressible material **102***c* allows the first section **102***a* to conform closely to the stock **107***a* of the firearm **107**, thereby maximizing contact surface area of the shell member **101** to the stock **107***a* of the firearm **107**. Each of the second sections **102***b* extends from the open lower end **101***b* on the opposing sides **101***c* of the shell member **101** towards the first section **102***a*. Each of the second sections **102***b* is made of a low friction material **102***d*, for example, a soft, wear-resistant textile material such JDC A902-2PT of JDC Coatings Inc., which is a high quality 1.0 mm black flocked fabric designed for demanding automotive interior anti-squeak applications. The low friction material **102***d* minimizes wear on the stock **107***a* due to abrasion. The low friction material **102***d* is used for efficient installation of the shell member **101** on the stock **107***a* of the firearm **107**, as the stock **107***a* slides against the second sections **102***b* of the inner frictional surface **102** of the shell member **101**. The outer surface **101***e* of the shell member **101** is rigid.

The base member **104** of the cheek support apparatus **100** is rigidly attached on the closed upper end **101***a* of the shell member **101**. In an embodiment, one or more of the shim members **105** of the cheek support apparatus **100** are removably attached on the base member **104** for adjustably positioning the cheek supporting member **106** on the base member **104**. The cheek supporting member **106** is removably attached on one of the shim members **105** or the base member **104** for supporting a user's cheek. If the user achieves a comfortable height without the shim members **105**, the cheek supporting member **106** can be directly connected to the base member **104**. The cheek support apparatus **100** disclosed herein supports the user's cheek during recoil of the firearm **107**. The cheek support apparatus **100** can also be adjusted on the stock **107***a* of the firearm **107** for enabling the user to clean the firearm **107**.

FIG. **2**A-**2**B exemplarily illustrate perspective exploded views of the cheek support apparatus **100**. The cheek support apparatus **100** disclosed herein comprises the shell member **101**, the base member **104** rigidly attached on the closed upper end **101***a* of the shell member **101**, one or more shim members **105**, and the cheek supporting member **106** as disclosed in the detailed description of FIG. **1**. Each of the shim members **105** are removably attached on the base member **104** for adjustably positioning the cheek supporting member **106** on the base member **104**. As exemplarily illustrated in FIGS. **2**A-**2**B and FIGS. **3**-**4**, each shim member **105** comprises a slot **108** and a key member **109**. The slot **108** longitudinally extends along a lower surface **105***a* of the shim member **105**. The key member **109** extends along an upper surface **105***b* of the shim member **105**. The slot **108** of one of the shim members **105** is configured to engageably connect to

the base member **104**. The rigidly attached base member **104** is configured as a key member that engageably connects to the slot **108** of one of the shim members **105**, or a slot **110** configured on the cheek supporting member **106**.

The key member **109** of each shim member **105** is configured to engageably connect to the slot **108** of another shim member **105**. The key member **109** of each shim member **105** is also configured to engageably connect to the slot **110** configured on the cheek supporting member **106**. The cheek supporting member **106** comprises a slot **110** longitudinally extending along a base **106***a* of the cheek supporting member **106**. The slot **110** of the cheek supporting member **106** is configured to engageably connect to a key member **109** of a shim member **105** or the base member **104**.

The slot **108** of each of the shim members **105** and the slot **110** of the cheek supporting member **106** are configured, for example, by shaping, milling, etc. The slot **108** of each of the shim members **105** and the slot **110** of the cheek supporting member **106** is, for example, a dovetail slot, a square slot, an inverted dovetail slot, etc. The key member **109** of each of the shim members **105** and the base member **104** is, for example, a tapered key, a square head key, a trapezoidal key, etc. For purposes of illustration, the detailed description refers to a slot **108** or **110** and a key member **109** used for engageably connecting a shim member **105** to the base member **104**, a shim member **105** to another shim member **105**, and a cheek supporting member **106** to a shim member **105** or the base member **104**. However, the scope of the cheek support apparatus **100** disclosed herein is not limited to a slot **108** or **110** and a key member **109** but may be extended to include other forms of engageable connectors such as mating fasteners, complementing dovetails, mechanical attachments, screws, adhesives, etc., and other functionally equivalent structures and methods such as friction fitting.

In another embodiment, the shim members **105** and the cheek supporting member **106** are attached to the shell member **101** using fasteners, for example, clips, clamps, adhesives, mechanical fasteners, etc.

FIG. **3** and FIG. **4** exemplarily illustrate a front orthogonal view and a rear orthogonal view of the cheek support apparatus **100** respectively. The cheek support apparatus **100** disclosed herein comprises the shell member **101**, the base member **104**, one or more shim members **105**, and the cheek supporting member **106** as disclosed in the detailed description of FIG. **1** and FIGS. **2**A-**2**B. The shell member **101** has a closed upper end **101***a* and an open lower end **101***b*. The shell member **101** comprises an inner frictional surface **102**. The inner frictional surface **102** defines an opening **103** between the closed upper end **101***a* and the open lower end **101***b* of the shell member **101** for accommodating the stock **107***a* of the firearm **107**. The inner frictional surface **102** comprises a first section **102***a* made of a high friction compressible material **102***c* and second sections **102***b* made of a low friction material **102***d*. The combination of the low friction material **102***d* and the high friction compressible material **102***c* provides ease of installation of the cheek support apparatus **100** on the stock **107***a* of the firearm **107** and provides resistance to recoil-induced slippage of the cheek support apparatus **100** from the stock **107***a* of the firearm **107**. The base member **104** configured as a key member is rigidly attached on the closed upper end **101***a* of the shell member **101**. The shim members **105** configured with slots **108** and key members **109** are removably attached on the rigidly attached base member **104** for adjustably positioning the cheek supporting member **106** on the base member **104**.

FIGS. **5**A-**5**B exemplarily illustrate installation of the cheek support apparatus **100** on a stock **107***a* of a firearm **107**. To install the cheek support apparatus **100** on the stock **107***a* of the firearm **107**, the user holds the shell member **101** and positions the opening **103** defined by the inner frictional surface **102** of the shell member **101** over the comb **111** of the stock **107***a* as exemplarily illustrated in FIG. **5**A. The user then presses the shell member **101** on the stock **107***a* to conform the shell member **101** to the contours of the stock **107***a* as exemplarily illustrated in FIG. **5**B. The cheek support apparatus' **100** resistance to rearward movement due to friction between the shell member **101** and the stock **107***a* is a function of the area of the shell member **101** that stays in contact with the stock **107***a*, the coefficient of friction of that contact area, and the direction in which the recoil force acts on the cheek support apparatus **100**. The friction is maximized in the direction of recoil due to the large surface area of the high friction compressible material **102***c* of the inner frictional surface **102** that is oriented in the same direction as the axis of the recoil. The surface of the stock **107***a* and the area of the inner frictional surface **102** covered with the high friction compressible material **102***c* are pressed together with minimal sliding.

In an embodiment, the shell member **101** of the cheek support apparatus **100** is softened by heat and then positioned on top of the comb **111** of the stock **107***a* with its line of symmetry above the comb's **111** line of symmetry. The shell member **101** is pushed down and bent until the shell member **101** is closely contoured to the stock **107***a*. When the material of the shell member **101** cools, the material rigidly contacts the stock **107***a*. If the stock **107***a* is not symmetric, the shell member **101** is positioned on top of the comb **111** of the stock **107***a* with its line of symmetry above the comb's **111** line of symmetry. The change in height of the comb **111** is accomplished by leaving a void between the two lines of symmetry during fabrication or by attaching a cheek supporting member **106** to the closed upper end **101***a* of the shell member **101**. The height of the cheek support apparatus **100** can be adjusted by engageably connecting one or more shim members **105** to the base member **104** and then attaching the cheek supporting member **106** to the upper most shim member **105**. The height of the cheek supporting member **106** and the shim member **105** on the shell member **101** can be varied based on a user's preferences. The surface of the cheek supporting member **106** can be made of any suitable material for the user's comfort. The shim members **105** and the cheek supporting member **106** can be removed from the cheek support apparatus **100** without removing the shell member **101** from the stock **107***a* of the firearm **107**, thereby reducing the surface wear on the stock **107***a* of the firearm **107**.

FIG. **6** exemplarily illustrates a position of a user **601** with the user's **601** cheek **602** resting against the cheek supporting member **106** of the cheek support apparatus **100**. In order to control recoil of a firearm **107**, the user **601** rests a cheek **602** on the firearm's **107** comb **111**. To simultaneously control recoil and see through the center of the riflescope, the firearm's **107** comb **111** must be at an appropriate height for resting the user's **601** cheek **602**. The preferred comb height is achieved by using the shim members **105** along with the cheek supporting member **106** on the shell member **101** of the cheek support apparatus **100**. The user **601** adjusts the position of the cheek supporting member **106** on the firearm's **107** comb **111** using one or more shim members **105**. Based on the position of the user **601**, the user **601** removably attaches the cheek supporting member **106** to either the base member **104** or a shim member **105** as disclosed in the detailed description of FIGS. **1**-**4**. After adjusting the position of the cheek supporting member **106**, the user **601** rests a cheek **602** against the cheek supporting member **106**. By resting the cheek **602**

against the height adjusted cheek support member **106**, the user **601** simultaneously controls recoil and sees through the center of the riflescope.

FIG. **7** exemplarily illustrates an auxiliary element **701** detachably attached on the cheek support apparatus **100** for accommodating multiple items **702** associated with a firearm **107**. In an embodiment, one or more auxiliary elements **701** are detachably attached on the cheek support apparatus **100** for accommodating multiple items **702** associated with the firearm **107**. For example, auxiliary elements **701** such as cartridge loops or other attachments are detachably attached on the opposing sides **101***c* on the outer surface **101***e* of the shell member **101** for accommodating ammunition or other items **702**. By installing cartridge loops or other attachments on the opposing sides **101***c* of the cheek support apparatus **100**, the cheek support apparatus **100** serves as a portable device to carry ammunition or other armament related items **702**.

FIG. **8** illustrates a method for detachably attaching the cheek support apparatus **100** on a stock **107***a* of a firearm **107**. The cheek support apparatus **100** comprising the shell member **101**, the base member **104**, the shim members **105**, and the cheek supporting member **106** as disclosed in the detailed description of FIG. **1** and FIGS. **2**A-**2**B, is provided **801**. The shell member **101** of the cheek support apparatus **100** disclosed herein is positioned **802** on the stock **107***a* of the firearm **107** for accommodating the stock **107***a* of the firearm **107** within the opening **103** as exemplarily illustrated in FIGS. **5**A-**5**B. The form fitting material of the shell member **101** conforms to the contours of the stock **107***a* of the firearm **107**. The inner frictional surface **102** of the shell member **101** rigidly contacts the stock **107***a* of the firearm **107** and restricts movement of the shell member **101** on the stock **107***a* of the firearm **107**. The shell member **101** comprises a first section **102***a* made of a high friction compressible material **102***c*, and second sections **102***b* made of a low friction material **102***d*. The high friction compressible material **102***c* of the first section **102***a* of the inner frictional surface **102** of the shell member **101** rigidly contacts the stock **107***a* of the firearm **107** and restricts movement of the shell member **101** on the stock **107***a* of the firearm **107**. The low friction material **102***d* of each of the second sections **102***b* of the inner frictional surface **102** of the shell member **101** enables slidable movement of the shell member **101** on the stock **107***a* of the firearm **107**.

In an embodiment, one or more shim members **105** are removably attached **803** on the rigidly attached base member **104** for adjustably positioning the cheek supporting member **106** of the cheek support apparatus **100** on the rigidly attached base member **104**. One of the shim members **105** is removably attached to the rigidly attached base member **104** by engageably connecting the slot **108** of that shim member **105** to the rigidly attached base member **104**. One of the shim members **105** is removably attached to another one of the shim members **105** by engageably connecting the slot **108** of that shim member **105** to the key member **109** of the other shim member **105**. The cheek supporting member **106** for supporting the user's **601** cheek **602** is removably attached **804** on one of the shim members **105**. The cheek supporting member **106** is removably attached to one of the shim members **105** by engageably connecting a slot **110** configured on the cheek supporting member **106** to the key member **109** of that shim member **105**. In an embodiment, when a comfortable height is achieved without the shim members **105**, the cheek supporting member **106** can be directly connected to the base member **104**.

FIG. **9** exemplarily illustrates a method for removing a cheek support apparatus **100** from the stock **107***a* of the firearm **107**. A user **601** downwardly orients **901** the bottom of the firearm **107**. The user **601** then gently grasps **902** the forearm of the firearm **107** and strongly grasps **903** the shell member **101** of the cheek support apparatus **100**. The user **601** then upwardly pulls **904** the shell member **101** from the stock **107***a* of the firearm **107** to remove the cheek support apparatus **100** from the stock **107***a* of the firearm **107**.

Consider an example where a user **601** uses the cheek support apparatus **100** disclosed herein attached to a firearm **107**. The user **601** uses the cheek support apparatus **100** to allow easy access to the firearm **107** for cleaning with no modification to the stock **107***a* and to control recoil of the firearm **107** during firing of the firearm **107**. To use the cheek support apparatus **100** disclosed herein, the user **601** positions the opening **103** of the shell member **101** on the stock **107***a* of the firearm **107** and pushes the cheek support apparatus **100** towards the stock **107***a* of the firearm **107**. As the inner frictional surface **102** of the shell member **101** comes in contact with the stock **107***a* of the firearm **107**, the user **601** moves the shell member **101** forward and then rearward to match the contours of the stock **107***a*. The inner frictional surface **102** is compressed by the clamping force of the shell member **101**. The inner frictional surface **102** comprises high friction compressible material **102***c*, for example, rubber, polyurethane foam, etc., and low friction material **102***d*. To install the cheek supporting member **106**, the slot **108** of one of the shim members **105** is inserted into the base member **104** by pushing the slot **108** over the base member **104**. If the height obtained by inserting the shim member **105** is sufficient for the user **601**, the user **601** attaches the cheek supporting member **106** onto the key member **109** extending along the upper surface **105***b* of the shim member **105**. The user **601** can then rest a cheek **602** on the cheek supporting member **106**, for example, during firing of the firearm **107**. If the height obtained by inserting the shim member **105** is not sufficient for the user **601**, the user **601** removes the cheek supporting member **106**, installs a second shim member **105** over the first shim member **105**, and then reinstalls the cheek supporting member **106** on the second shim member **105**.

The user **601** can also remove the cheek supporting member **106** to allow access to the barrel of the firearm **107** for cleaning the barrel using a cleaning rod. The user **601** may clean the barrel of the firearm **107** by removing the cheek support apparatus **100** from the stock **107***a* of the firearm **107** or by only removing the cheek supporting member **106** and the shim members **105** from the shell member **101**. To remove the cheek support apparatus **100** from the stock **107***a* of the firearm **107**, the user **601** orients the bottom of the firearm **107** downwardly and grasps the forearm of the firearm **107** gently. The user **601** then strongly grasps the shell member **101** and upwardly pulls the shell member **101** from the stock **107***a* of the firearm **107**. The user **601** removes the cheek supporting member **106** and the shim members **105** from the shell member **101** by disengaging the cheek supporting member **106** from the shim member **105** and then disengaging the shim member **105** from the base member **104**. If the cheek supporting member **106** is directly connected the base member **104**, the user **601** disengages the cheek supporting member **106** from the base member **104**.

The foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention disclosed herein. While the invention has been described with reference to various embodiments, it is understood that the words, which have been used herein, are words of description and illustration, rather than words of limitation. Further, although the invention has been described herein with reference to particular

means, materials and embodiments, the invention is not intended to be limited to the particulars disclosed herein; rather, the invention extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims. Those skilled in the art, having the benefit of the teachings of this specification, may effect numerous modifications thereto and changes may be made without departing from the scope and spirit of the invention in its aspects.

I claim:

1. A cheek support apparatus for a firearm, comprising:

a generally inverted U-shaped shell member made of a form fitting material configured to conform to contours of a stock of said firearm, said generally inverted U-shaped shell member having a closed upper end and an open lower end;

said generally inverted U-shaped shell member comprising an inner frictional surface, wherein said inner frictional surface of said generally inverted U-shaped shell member defines an opening between said closed upper end and said open lower end for accommodating said stock of said firearm, wherein said inner frictional surface of said generally inverted U-shaped shell member rigidly contacts said stock of said firearm and restricts movement of said generally inverted U-shaped shell member on said stock of said firearm;

a base member rigidly attached on said closed upper end of said generally inverted U-shaped shell member;

a cheek supporting member removably attached on said base member for supporting a cheek of a user; and

one or more shim members removably attached on said base member for adjustably positioning said cheek supporting member on said base member, wherein each of said one or more shim members comprises a slot longitudinally extending along a lower surface of said each of said one or more shim members, and a key member extending along an upper surface of said each of said one or more shim members, wherein said slot of one of said one or more shim members is configured to engageably connect to said base member, and wherein said key member of said one of said one or more shim members is configured to engageably connect to one of said slot of another one of said one or more shim members and a slot configured on said cheek supporting member;

whereby said cheek support apparatus supports said cheek of said user during recoil of said firearm.

2. The cheek support apparatus of claim **1**, wherein said inner frictional surface is selectively configured with different coefficients of friction to enable said rigid contact of said generally inverted U-shaped shell member to **1** said stock of said firearm.

3. The cheek support apparatus of claim **1**, wherein said inner frictional surface comprises a first section and second sections, wherein said first section proximally extending from said open lower end on opposing sides of said generally inverted U-shaped shell member towards said closed upper end is made of a high friction compressible material, and wherein each of said second sections extending from said open lower end on said opposing sides of said generally inverted U-shaped shell member towards said first section is made of a low friction material.

4. The cheek support apparatus of claim **1**, wherein said base member is configured as a key member that engageably connects to one of said slot of said one of said one or more shim members, and said slot configured on said cheek supporting member.

5. The cheek support apparatus of claim **1**, wherein said slot configured on said cheek supporting member longitudinally extends along a base of said cheek supporting member, wherein said slot of said cheek supporting member is configured to engageably connect to one of said key member of one of said one or more shim members and said base member.

6. The cheek support apparatus of claim **1**, wherein said form fitting material of said generally inverted U-shaped shell member is a thermoplastic material.

7. The cheek support apparatus of claim **1**, further comprising one or more auxiliary elements detachably attached on said cheek support apparatus for accommodating a plurality of items associated with said firearm.

8. A method for detachably attaching a cheek support apparatus on a stock of a firearm, comprising:

providing said cheek support apparatus comprising:

a generally inverted U-shaped shell member made of a form fitting material configured to conform to contours of said stock of said firearm, said generally inverted U-shaped shell member having a closed upper end and an open lower end;

said generally inverted U-shaped shell member comprising an inner frictional surface, wherein said inner frictional surface of said generally inverted U-shaped shell member defines an opening between said closed upper end and said open lower end for accommodating said stock of said firearm, wherein said inner frictional surface is selectively configured with different coefficients of friction to enable rigid contact of said generally inverted U-shaped shell member to said stock of said firearm;

a base member rigidly attached on said closed upper end of said generally inverted U-shaped shell member;

a cheek supporting member removably attachable on said rigidly attached base member; and

one or more shim members removably attached on said rigidly attached base member, wherein each of said one or more shim members comprises a slot longitudinally extending along a lower surface of said each of said one or more shim members, and a key member extending along an upper surface of said each of said one or more members;

positioning said generally inverted U-shaped shell member of said cheek support apparatus on said stock of said firearm for accommodating said stock of said firearm within said opening, wherein said form fitting material of said generally inverted U-shaped shell member conforms to said contours of said stock of said firearm, wherein said inner frictional surface of said generally inverted U-shaped shell member rigidly contacts said stock of said firearm and restricts movement of said generally inverted U-shaped shell member on said stock of said firearm; and

removably attaching said cheek supporting member on said rigidly attached base member for supporting a cheek of a user.

9. The method of claim **8**, wherein said inner frictional surface comprises a first section and second sections, wherein said first section proximally extending from said open lower end on opposing sides of said generally inverted U-shaped shell member towards said closed upper end is made of a high friction compressible material, and wherein each of said second sections extending from said open lower end on said opposing sides of said generally inverted U-shaped shell member towards said first section is made of a low friction material.

10. The method of claim 9, wherein said high friction compressible material of said first section of said inner frictional surface of said generally inverted U-shaped shell member rigidly contacts said stock of said firearm and restricts movement of said generally inverted U-shaped shell member on said stock of said firearm.

11. The method of claim 9, wherein said low friction material of said each of said second sections of said inner frictional surface of said generally inverted U-shaped shell member enables slidable movement of said generally inverted 1 U-shaped shell member on said stock of said firearm.

12. The method of claim 8, further comprising removably attaching one or more of said one or more shim members on said rigidly attached base member of said cheek support apparatus for adjustably positioning said cheek supporting member of said cheek support apparatus on said rigidly attached base member.

13. The method of claim 8, wherein one of said one or more shim members is removably attached to said rigidly attached base member by engageably connecting said slot of said one of said one or more shim members to said rigidly attached base member.

14. The method of claim 8, wherein one of said one or more shim members is removably attached to another one of said one or more shim members by engageably connecting said slot of said one of said one or more shim members to said key member of said another one of said one or more shim members.

15. The method of claim 8, wherein said cheek supporting member is removably attached to one of said one or more shim members by engageably connecting a slot configured on a base of said cheek supporting member to said key member of said one of said one or more shim members.

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