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RECOIL ABSORBING MEANS FOR FIREARMS

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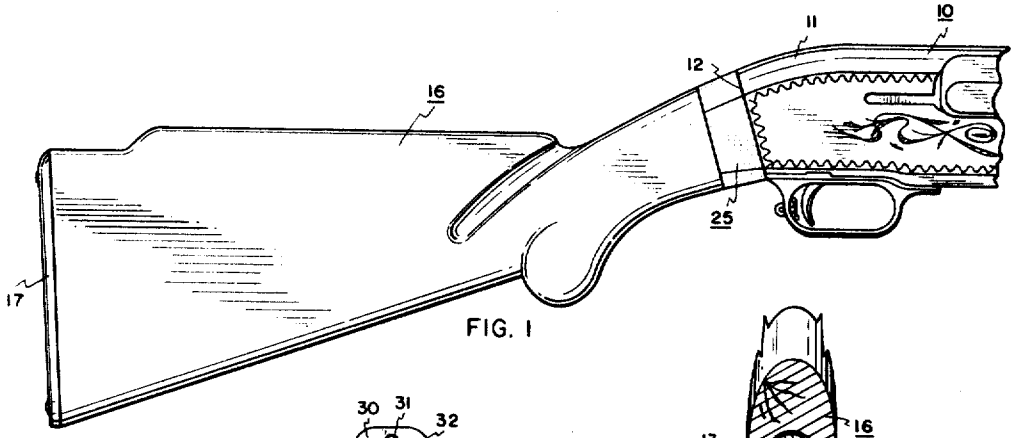

FIG. 1

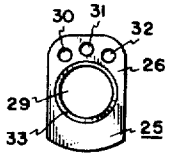

FIG. 4

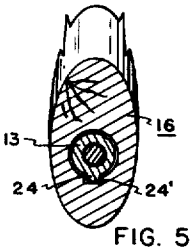

FIG. 5

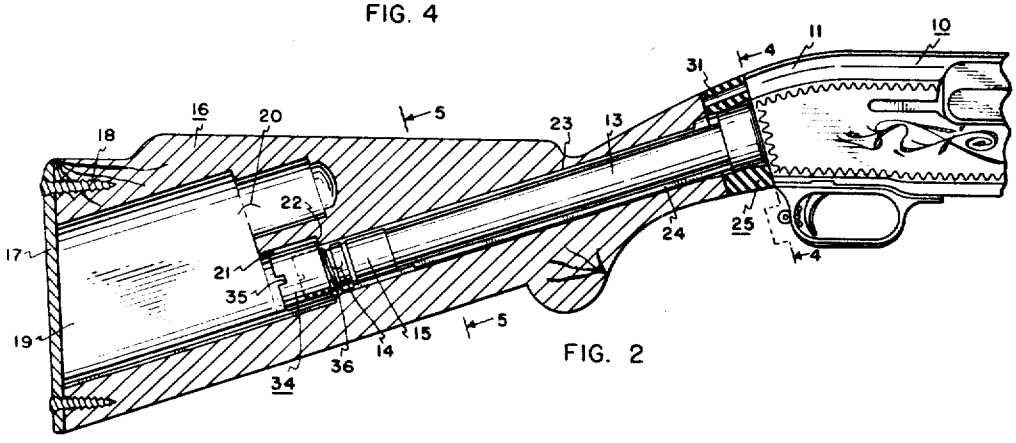

FIG. 2

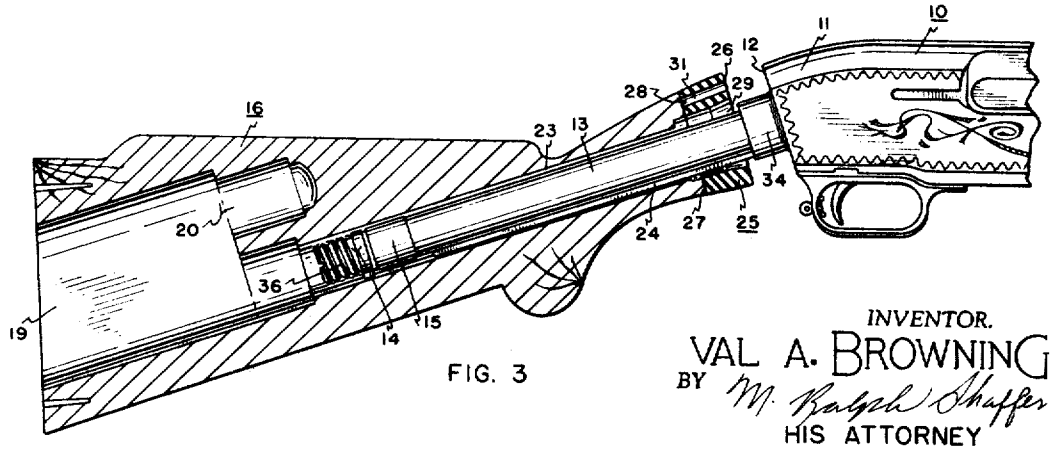

FIG. 3

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RECOIL ABSORBING MEANS FOR FIREARMS

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The present invention relates to firearms, in particular, those firearms having stocks such as rifles and shotguns; more particularly, the present invention comprises an improvement in such firearms by supplying, between the stock and breech of the firearm, a novel, resilient, buffer pad for largely absorbing recoil of the firearm and impeding recoil movement in the stock.

In the past there has been recognized this problem: when one is holding a rifle or shotgun in firing position, the sportsman experiences considerable discomfort upon firing the gun when the stock of the piece, through recoil, rapidly moves across the cheek and jaw of the face. This scuffing of the cheek is, of course, highly undesired and unwanted. The problem reduces to one of insuring that the stock may be conveniently held through firing in a stationary manner and yet be substantially free from recoil jar, otherwise present upon firing.

Of course, resilient butt pads have been used for some time, and in many configurations, to relieve the shoulder from recoil shock. However, even though a user employs a resilient butt pad, the movement of the stock relative to the cheek of the user is still present in a normal situation. In the present invention, as will be seen, the inclusion of a recoil buffer pad between the stock and breech of the firearm serves not only to reduce, in large measure, recoil or shock against the shoulder of the user, but also the shock movements of the stock relative to the jaw and cheek of the sportsman.

A prior approach in solving the problem of recoil jar and scuffing, by the stock of the piece against the cheek and jaw of the user, has been to provide a stock-sleeve arrangement with suitable springs and into which the stock fits, this so that stock recoil will be absorbed by the springs and yet not disturb the positioning of the sleeve relative to the cheek of the user. This approach, however, is very cumbersome and expensive, and has not been successful commercially.

Accordingly, a principal object of the present invention is to provide a new and useful resilient buffer pad between the stock and breech of a firearm, this to reduce stock recoil jarring against the shoulder, cheek, and jaw area of the user.

A further object of the invention is to provide a firearm construction of the shotgun or rifle type wherein stock alignment relative to the remainder of the firearm is both insured and preserved during assembly of the piece and also during use and storage thereof.

An additional object is to provide means for adjusting the compression of a buffer pad, disposed between the breech and stock of the firearm, this so the degree of recoil buffer action may be controlled and adjusted from time to time as may be necessary through slight changes in the physical characteristics of the buffer pad.

An additional object is to provide a novel buffer pad for insertion between the stock and breech of the firearm, the pad including relief areas wherein material of the buffer pad may "flow" to prevent outward deformity of the pad through use.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by a reference to the following description, taken in connection with the accompanying drawings in which:

FIGURE 1 is a fragmentary side elevation of a firearm incorporating the present invention.

FIGURE 2 is an elevation, partially in longitudinal vertical section, of the firearm shown in FIGURE 1, and illustrates the completely assembled firearm.

FIGURE 3 is a view similar to FIGURE 2 but illustrates the firearm when the butt-plate and adjustment nut are removed and the barrel unit of the piece is beginning to be withdrawn from the stock of the firearm.

FIGURE 4 is a front elevation of the resilient recoil buffer pad of the present invention and is taken along the line 4—4 in FIGURE 2.

FIGURE 5 is a fragmentary section taken along the line 5—5 in FIGURE 2, illustrating the preferred key and keyway construction between the stock and action-spring tube of the piece.

In FIGURE 1 barrel unit **10** includes a conventional breech **11** having a breech rear face **12**. Extending rearwardly from the breech **11** is elongate member in the form of an action-spring containing tube **13** the latter of which is provided with a threaded end plug **14**. Plug **14** takes somewhat the form of a union, is preferably made of nylon or other suitable material to abut the action spring (not shown) contained in tube **13** and, in being threaded into the enlarged tubular end **15** of tube **13**, serves as a stop abutment for such action spring. Stock **16** includes the conventional butt-plate **17** and releasable attachment screws **18**, the latter releasably securing the butt-plate **17** to the stock **16**. Stock **16** includes a hollow interior **19** a portion of which may combine with well **20** for making the stock as light as possible.

Of significance is the inclusion in stock **16** of a nut means, hollow relief area **21** terminating at shoulder **22**. Annular shoulder **22** is co-terminous with the rear extremity of elongate passageway **23**, the same generally comprising a bore and providing an open area for the reception of action-spring tube **13**.

In a preferred form of the invention the tube **13** includes a longitudinal key **24**, this key communicating with a cooperating longitudinal keyway **24'** made integral with passageway **23**. This key and keyway combination serves the important purposes of (1) providing an alignment means when tube **13** is inserted rearwardly through the stock, through passageway **23**, for assembly purposes, and (2) for preventing misalignment of the stock relative to the breech during use or otherwise.

Of special importance in the invention is inclusion of a resilient, recoil buffer pad **25**. Puffer pad **25** includes a forward face **26** and a rear surface **27**. Forward face **26** engages the rear face **12** of breech **11**. Preferably, the rear surface **27** of buffer pad **25** is cemented to face **28** of the stock.

The resilient recoil buffer pad **25**, of course, will include a central through-aperture **29**, providing admittance of the action-spring tube **13** therethrough, and also preferably includes relief apertures **30**, **31**, and **32**. With respect to through-aperture **29**, the same may also include an annular chamfered area **33** to accommodate fitting over boss **34** which is integral with the breech **11** and action-spring tube **13**.

The structure is assembled and operates as follows. In manufacture, resilient recoil buffer pad **25** is preferably cemented, bonded or otherwise affixed to the face **28** of stock **16**. Barrel unit **10** is urged rearwardly with respect to stock **16** so that the action-spring tube **13** may proceed rearwardly through the buffer pad **25** and through passageway **23** to the position shown in FIGURE 2. Thereupon, adjustment nut **34**, preferably having a tool-receiving rotating slot **35**, is threaded onto the threaded end

plug **14** at portion **36** thereof and tightened down appropriately. It will be noted that the compression loading of resilient pad **25** may be controlled through the adjustment of nut **34**. This proves a highly desirable situation, particularly where through long and repeated use the buffer pad **25** changes its durometer and/or configuration in slight degree. Hence, the adjustment nut **34** not only serves to hold the assembly together but also provides adjustment means to control the compression applied to the recoil buffer pad and to compensate for changes in the physical characteristics of buffer pad **25**.

Apertures **30–32** are provided as flow relief areas, and for this purpose. The material of the buffer pad **25** tends to "flow" into these relief areas (**30–32**), upon firing the piece, so as to not cause a bulging outwardly of the recoil buffer pad **25** at firing or through repeated use. These relief areas thereby also preserve the bonded contact between the buffer pad **25** and the stock **16**.

As to both initial and subsequent assembly, the manufacturer is to preserve great care in the tightening down of adjustment nut **34** so as to assure that, for a particular recoil characteristic, the stock, through average holding of the firearm, will not tend to move across the cheek of the user as it is aimed toward the intended target. Thus, when the user aims the firearm and squeezes the trigger, the firing and resultant recoil and shock will be absorbed substantially entirely by buffer pad **25**, and this without translating the recoil jar back through the stock. In this way, through average manual pressure as is present through the holding of the firearm, the stock will remain substantially stationary against the cheek even during and after firing of the firearm.

As to choice of material for resilient recoil buffer pad **25**, it is preferred that the same be an integral piece of natural or synthetic rubber (such as neoprene or buna-N—which are oil-resistant), and which have a durometer (e.g., 45 on the Shore A scale) rating sufficient to provide the resiliency desired.

Again, it should be re-observed that the elongate, longitudinal key and keyway **24** and **24'** prevent misalignment of the stock relative to the remainder of the firearm both at assembly and during use.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects, and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

1. A firearm including, in combination, a barrel unit including a breech; a stock; a resilient, recoil buffer pad disposed between said breech and said stock; and means securing said stock and breech together for compression-loading said buffer pad therebetween.

2. Structure according to claim **1** wherein said stock includes a longitudinal passageway and said buffer pad includes a central aperture aligned with said passageway, said breech including a rearwardly extending elongate member disposed through said central aperture and passageway, and means for determining the positioning of said elongate member within said stock.

3. Structure according to claim **1** wherein said buffer pad is bonded to said stock.

4. Structure according to claim **1** wherein said buffer pad is provided with material-flow relief apertures interior of the exterior surface thereof.

5. Structure according to claim **2** wherein said elongate member has a rearward threaded extremity, said stock including a nut relief area terminating in a shoulder coterminous with said passageway rearwardly thereof, said means including nut means threadedly engaging said threaded extremity of said elongate member and reaction-abutting said shoulder.

6. Structure according to claim **2** wherein said stock and elongate member structurally intercooperate in a longitudinally slideable, key-keyway construction.

7. Structure according to claim **5** wherein said rearwardly extending elongate member comprises an action-spring tube, said tube terminating in a threaded end plug, said nut means engaging said threaded end plug.

8. Structure according to claim **5** wherein said nut means adjustably intercooperates with said elongate member to vary the compression of said buffer pad.

9. Structure according to claim **5** wherein said stock is provided with a releasable butt-plate releasably secured to said stock over said nut relief area.

No references cited.

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