Inventor; and
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Title: HUNTING AND SPORTING FIREARM

Abstract: In a hunting and sporting firearm including a rolling block (4) having a cavity (6) for accommodating at least one action (8), the latter comprising a hammer (24) for actuating a firing pin (10), a propulsion element (27) for propelling the hammer (24) and a trigger (9), said propulsion element is subjected to the action of shock absorbing means (49) consisting of its own drive means (35) constituted by a spiral spring (36).
Description

Hunting and sporting firearm

Technical Field

This invention relates to a hunting and sporting firearm. In particular, this invention relates to an action forming part of a firearm of this kind.

The term "action" is used here to mean the combined parts of a percussion and firing mechanism which, upon actuation of the trigger, causes a firing pin to impact the cartridge primer so as to ignite the propellant.

For simplicity, this specification will refer to a single-barrel firearm, although it will be understood that it also applies to double-barrel firearms (with side-by-side or over-and-under barrels).

Background Art

As is known, the action is mounted inside the rolling block, that is, the steel block attached to the stock and to which the barrels are pivoted. In a single-barrel firearm, the action comprises a hammer mounted on a transverse pin and designed to directly strike the firing pin of the cartridge primer, and means for propelling the hammer, consisting of snap action means actuated by the trigger.

As also known in prior art, the firing pin consists of a substantially cylindrical rod operated by a spiral retracting spring that causes it to slide lengthways in a through hole made in a separating wall between the inside of the rolling block and the breech.

When the hammer, actuated by the propulsion means, strikes one end of the firing pin extending into the cavity that houses the action, the second, round-tipped end of the rod penetrates the barrel for a certain length in such a way as to strike the primer.
After each shot, in order to enable the barrel to be opened to extract the empty cartridge case and reload the gun, the firing pin must be retracted from the breech into the through hole so as to prevent wear and breakage caused by interference of the second end of the firing pin with the cartridge case and the barrel itself.

This is done by the retracting spring. The firing pin, however, can be retracted only if the hammer is free to withdraw, or in other words, if it is no longer in contact with the propulsion means or subjected to their pushing force.

For this reason, the propulsion means, which are operated by the spring elastic means, are equipped with stop means, adjusted in such a way that, under end of stroke conditions, that is to say, when the elastic means are extended as far as possible, the hammer is no longer subjected to their pushing force and performs only by inertia a limited final angular stroke until it impacts the cartridge case and thus allows the firing pin to return freely to its initial rest position.

It has been found, however, that on account of the extremely strong forces applied to the propulsion means by the elastic means, the stopping means are subjected to violent shocks which cause wear and which, in the long run, modify their position to such an extent as to prevent the firing pin from returning to its initial rest position, thereby giving rise to the problems described above.

Disclosure of the Invention

The aim of the present invention is, therefore, to overcome the above-mentioned disadvantages by providing a firearm equipped with a simple action that is more durable and reliable than actions known in prior art.

According to the invention, this object is achieved by a hunting and sporting firearm having the characteristics described in claim 1.

Brief Description of the Drawings

The technical characteristics of the invention, with
reference to the above aims, are clearly described in the claims below and its advantages are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

Figures 1 to 4 are schematic side views, with some parts in cross section, showing a portion of a firearm equipped with an action according to the present invention in four different operating conditions;

Figure 5 is a perspective exploded view of a detail from Figures 1 to 4 comprising the action according to the invention;

Figures 6 to 9 are schematic side views, with some parts in cross section, showing a detail of the action according to the invention in four different operating conditions.

Detailed Description of the Preferred Embodiments of the Invention

With reference to Figures 1 and 2, the numeral 1 denotes in its entirety an over-and-under firearm comprising a pair of barrels 2 (partially illustrated), and a stock 3 (partially illustrated), between which there is a rolling block 4 to which the barrels 2 are pivoted by means of a hinge pin 5.

The numeral 6 denotes a cavity in the rolling block 4, designed to accommodate a snap action mechanism 7 comprising, for each barrel 2, an action 8 which, upon being actuated by a trigger 9, causes a respective firing pin 10 associated with each barrel 2 to impact the case of a cartridge (not illustrated).

Each firing pin 10 consists of a substantially cylindrical rod 11 having a rim 11a at an intermediate position of it and housed in a through hole 12 made in a transversal wall 13 separating the cavity 6 from the respective barrel 2. Positioned around each firing pin 10 and abutting against the rim 11a there is a helical spring 14 for retracting the firing pin 10 into the cavity 6.

Since the two actions 8, each associated with one of the barrels 2, are exactly the same, reference will hereinafter be made to only one firing pin 10 and to the respective action 8.
As illustrated in Figures 3, 4 and 5, the cavity 6 has at the bottom of it an opening 15 and is defined by the aforementioned transversal wall 13 and by two longitudinal walls 16 and an end wall 17 attached to the stock 3 and an upper wall 18 that closes it.

The action 8 forms part of a unit 19 that can be extracted from the cavity 6 and re-inserted into the latter through the opening 15, and is mounted in the cavity 6 by quick fitting and release means labelled 20 in their entirety.

The extractable unit 19 includes a supporting member 21 on which the action 8 is mounted and which is defined, at the bottom, by a mobile wall 22 that closes the opening 15 and has a trigger guard 23 attached to it.

The trigger 9 projecting outwardly from the wall 22 forms part of the action 8. The action 8 further comprises a hammer 24 for directly actuating the firing pin 10, mounted on the supporting member 21 by means of a transverse pin 25, a customary mechanism 26 (not illustrated) for releasing the hammer 24 when the trigger 9 is actuated and a propulsion element, labelled 27 as a whole, for propelling the hammer 24.

As illustrated in Figures 5 to 9, the propulsion element 27 comprises means 28 for actuating the hammer 24 and mobile, along an axis 29 defined by guide means 30 consisting of a rod 31, between a retracted loading position (Figures 1 and 6) and an advanced position (Figure 7) in which the hammer 24 is propelled towards the firing pin 10.

The actuating means 28 consist of a tubular element 32 coaxial with the axis 29 and having a first, round-tipped end 33 that actuates the hammer 24 and a U-shaped protrusion 34 at the other end.

The tubular element 32 houses means 35 for driving the actuating means 28 and consisting of a spiral spring 36 wound around the guide rod 31 which, at its free end, is equipped with a substantially parallelepiped-shaped end block 37 abutting against a pin 38 transversal to the axis 29 and attached to the supporting member 21.

The numeral 39 denotes means for stopping the actuating
means 28 and having an elongated portion 40 parallel to the axis 29 and slidably inserted between the branches of the U-shaped protrusion 34. The elongated portion 40 has a T-shaped end 41 whose transversal section is designed to engage the branches of the protrusion 34 which thus defines means for opposing the T-shaped portion of the end 41.

As can be seen better in Figure 5, at its second end the elongated portion 40 has a wall 42 transversal to the axis 29 and having made in it a hole 43 through which the rod 31 can slide. The wall 42 is interposed between one end of the spiral spring 36 protruding from the tubular element 32 and the block 37 and, for the reasons that will become clear in the description of how the propulsion element 27 operates, constitutes abutting means 44 integral with the stopping means 39.

The numeral 45 denotes a guide wall, orthogonal to the wall 42 and coplanar with the elongated portion 40 and designed to slide on an upper face of the end block 37.

During use, starting from the condition illustrated in figure 1 e 6, where the hammer 24 is retracted in the cocked position and the tubular element 32 and spring 36 are, respectively, retracted and compressed, pulling the trigger 9 causes the mechanism 26 to release the hammer 24 which turns about the pin 25, in an anticlockwise direction in the drawings, driven by the tubular element 32 under the action of the spring 36.

The tubular element 32 drives the hammer 24 so it turns as far as the point where the branches of the protrusion 34 engage the T-shaped end 41 of the stopping means 39, after which, by inertia, it performs a limited final angular stroke until the firing-pin 10 impacts the cartridge case.

The impact of the T-shaped end 41 of the elongated portion 40 against the branches of the of the U-shaped protrusion 34 of the tubular element 32 causes the spring 36 to be compressed by the wall 42 and, thus, at this stage, the propulsion element 27 is subjected to the action of respective shock absorbing means 49 consisting of elastic means constituted by the spiral spring 36 itself.

The presence of these shock absorbing means 49 makes the
action 8 according to this invention more durable and reliable than prior art actions described above.

Lastly, it should also be noticed that replacement of the action 8, should this be necessary for any reason, is extremely quick and easy thanks to the quick-release means 20, consisting of a pressure fit 46 between the supporting member 21 and the wall 13, and a button 47 for releasing a pin 48 that locks the supporting member 21 itself on a longitudinal wall 16 of the rolling block 4.

It will be understood that the invention described may be useful in many industrial applications and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.
Claims

1. A hunting and sporting gun including a rolling block (4) with a cavity (6) for housing at least one action (8) comprising a hammer (24) for actuating a respective firing pin (10) and a propulsion element (27) for propelling the hammer (24) and a trigger (9), characterised in that it comprises shock absorbing means (49) for damping the impact of the propulsion element (27).

2. The firearm according to claim 1, characterised in that the propulsion element (27) comprises: means (28) for actuating the hammer (24) and mobile along an axis (29) between a retracted loading position and an advanced, hammer (24) propelling position; means (39) for stopping at the advanced propelling position; and means (35) for driving the actuating means (28).

3. The firearm according to claim 2, characterised in that the drive means (35) consist of a spiral spring (36) substantially coaxial with the axis (29) and positioned between the actuating means (28) and abutting means (44) integral with the stopping means (39).

4. The firearm according to claim 1, characterised in that the abutting means (44) are slidably mounted on respective guide means (30) coaxial with the axis (29).

5. The firearm according to claim 4, characterised in that the guide means (30) are defined by a rod (31) having at one end of it a block (37) for connection to a fixed stop pin (38).

6. The firearm according to claim 4, characterised in that the shock absorbing means (49) consist of elastic means acting on the abutting means (44).
7. The firearm according to one of the foregoing claims from 1 to 6, characterised in that the shock absorbing means (49) are constituted by the spiral spring (36).

8. The firearm according to one of the foregoing claims from 1 to 7, characterised in that the actuating means (28) comprise a tubular element (32) coaxial with the axis (29) having at one end a tip (33) for actuating the hammer (24) and housing the rod (31), with the spiral spring (36) interposed between them; the tubular element (32) having a protrusion (34) defining opposing means designed to engage the stopping means (39).

9. The firearm according to one of the foregoing claims from 1 to 8, characterised in that the action (8) forms part of a unit (19) that can be extracted from the cavity (6) and re-inserted into the latter through an opening (15).

10. The firearm according to claim 9, characterised in that it comprises means (20) for quickly fitting and releasing the unit (19) in the cavity (6).

11. The firearm according to claim 9, characterised in that the unit (19) comprises a supporting member (21) for mounting the hammer (24), the propulsion element (27) and the trigger (9).
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

F41A19/54  F41A19/15

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)

F41A

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

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

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of box C.

**Date of the actual completion of the international search**

12 December 2005

**Date of mailing of the international search report**

21/12/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epos nl, Fax: (+31-70) 340-3016

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