(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 643 204 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.04.2006 Bulletin 2006/14

(51) Int Cl.:
F41A 21/40 *(2006.01)*

(21) Application number: **05108586.8**

(22) Date of filing: **19.09.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **21.09.2004 IT MI20041805**

(71) Applicant: **Fabarm S.p.A. Fabbrica Bresciana Armi**
25039 Travagliato (Brescia) (IT)

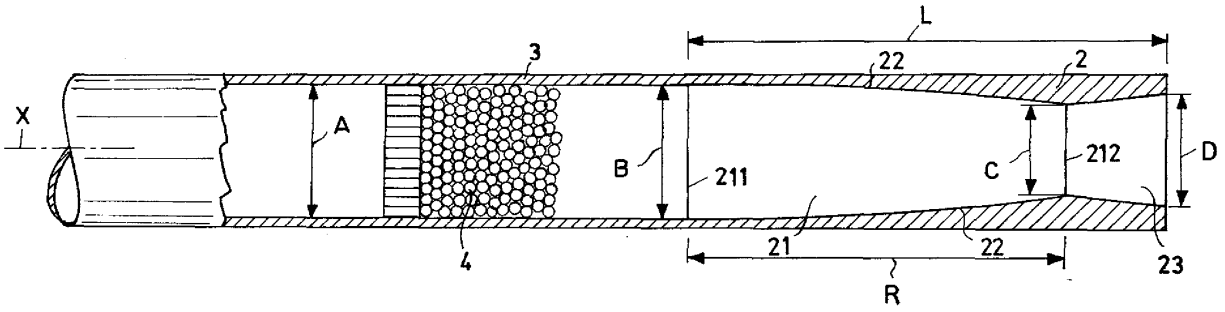
(72) Inventor: **OLINI, Ottavio Mario**
25034, ORZINUOVI (Brescia) (IT)

(74) Representative: **Coppo, Alessandro et al**
Ing. Barzanò & Zanardo Milano S.p.A.,
Via Borgonuovo, 10
20121 Milano (IT)

(54) Choke for rifle barrels

(57) Choke (2) for rifle barrels (3) comprising a cylindrical body that can be associated inside said barrel, having a first conical portion (21) that has a concave curvilinear profile (22) with respect to a longitudinal axis (X) of said barrel.

Fig.2



EP 1 643 204 A2

Description

[0001] The present invention refers to a choke for smooth bore rifle barrels. In particular, the present invention refers to a choke for rifle barrels that substantially carries out a narrowing of the exit section of the shot with respect to the internal diameter (bore) of the barrel itself.

[0002] The present invention is equivalently applicable to both interchangeable chokes, which for example screw inside rifle barrels, and chokes formed inside the barrel.

[0003] Notoriously, the narrowing is suitable for determining a constriction of the column of pellets that produces, passing from a larger section to a smaller one, a diameter of the pattern of the pellets that is variable according to the magnitude of the narrowing itself.

[0004] The prior art foresees narrowings (or chokes) that, starting from one tenth of a millimetre, reach ten tenths of a millimetre with further intermediate solutions. The variation of the diameter and of the concentration of the pattern of the pellets is functional for the requirements and needs of the hunter and of the shooter in reference to the type of hunting, individual preference and other more general shooting requirements. The length of the choked portion or of the choke is variable from manufacturer to manufacturer, for example from about 40 to 60 mm in length and it normally consists in some cases of a simple conical portion or else a conical portion associated with a cylindrical portion, like in the choke illustrated in figure 1.

[0005] The choker of a barrel (or the interchangeable choke) is determinant for a good external ballistic result, i.e. the speed of the shot, the regularity of distribution of the pellets and the concentration thereof, proportionally to the values of the choker for the relative firing distances. Generally, the best ballistic results are obtained with substantially long choker portions because the pellets, made from lead or steel, in their passage from a large section to a smaller one, undergo less constriction and less friction; these are important conditions for obtaining a spray not only homogeneously distributed, but with higher residual speeds of the individual pellets. These parameters are greater if the pellet manages to keep its spherical shape and consequently a greater stability and penetration, also over substantial distances (for example in excess of 25-30 metres). It is therefore logical that manufacturers try to make barrels and chokes of a geometrical shape and size that, compatibly with the industrial process, leads to the advantages described above.

[0006] In technology for producing interchangeable barrels or chokes it is certainly easier to make the inner profiles shorter for reasons of greater ease of manufacture, of tooling and of degrees of finish, especially if not equipped with modern technology machines also considering that one must work inside a tube and with tiny tolerances and with great precision.

[0007] The increasingly long and high-performance shooting distances required today by hunters and shooters have, however, led manufacturers to refine their technologies, taking both the choke of a fixed barrel and interchangeable inner chokes to ever greater lengths, which on average reach 60-70 mm in length and generally with a conical portion and a final cylindrical portion.

[0008] The Applicant has noted the importance of the profile of the internal geometry, which allows the pellets to be "choked" with the least possible friction, without excessive constrictions against each other, keeping their spherical shape substantially unaltered.

[0009] The Applicant has made a choke for a smooth bore rifle barrel that has a first conical portion having a concave curvilinear profile with respect to the longitudinal axis of said barrel and a second preferably cylindrical or alternatively conical portion.

[0010] An aspect of the present invention concerns a choke for rifle barrels comprising a cylindrical body that can be associated inside said barrel, having a first conical portion, characterised in that said first conical portion has a concave curvilinear profile with respect to a longitudinal axis of said barrel.

[0011] Further purposes and advantages of the choke according to the present invention shall become clear from the following description and from the attached drawings, provided as a non-limiting example, in which:

- figure 1 represents a longitudinal section view of an interchangeable choke according to the prior art;
- figure 2 represents a longitudinal section view of an interchangeable choke according to the present invention.

[0012] With reference to figure 2, the choke 2 according to the present invention has a cylindrical body, able to be associated inside said barrel, having an outer diameter corresponding to the internal diameter A of a smooth bore rifle barrel 3. The choke is preferably screwed or firmly fastened inside said barrel by the exit hole 31 of the barrel itself. The obviously fixed choke can also be directly formed inside the rifle barrel.

[0013] The figures also highlight a column of pellets 4 that travels inside said barrel following the explosion of the cartridge in which they were contained.

[0014] Said choke comprises a first conical portion 21 having a concave curvilinear profile 22 with respect to the longitudinal axis X of said barrel. Preferably, said concave curvilinear profile 22 is a parabolic profile.

[0015] Said first portion has circular cross sections, perpendicular to said longitudinal axis. Moreover, the diameter B of a first end 211 of said first portion 21 is smaller than a diameter C of the opposite end 212.

[0016] The choke also comprises, downstream of said first portion, a second portion 23, which fits with said first portion, having its terminal exit diameter D greater than or equal to the diameter C of said fitting portion. Said second portion has circular cross sections, perpendicular to said longitudinal axis and its profile is preferably a curvilinear profile, for example parabolic or alternatively it is a rectilinear profile.

[0017] The total length L of the choke according to the present invention is for example greater than 80 mm with a length of the first portion R of about 70 mm.

[0018] The internal profile of the first portion of the choke that is variable and ribbed instead of flat as happens for all of the prior art, allows the pellets, in their passage from the entry section B in the choke to the smaller section C, less constriction and less friction so as to obtain a spray not only homogeneously distributed but with higher residual speed of the individual pellets with respect to the flat profile.

[0019] The first portion is functional for channelling the pellets from a large section to a smaller one with a consequent increase in speed of the pellets. The narrowing value is variable according to the type of choke that one wishes to make.

[0020] Usually, chokes adjusted by international parameters range from a minimum of two tenths of a millimetre up to a maximum of ten tenths of a millimetre.

[0021] The second portion of the choke is functional to restabilise the column of pellets after the stress that they undergo in the passage of the choked fitting part. Moreover, such a portion through its opening reduces the negative effects of the exit impact.

[0022] In general, the total internal profile of the choke, in its preferred embodiment, is in the form of an irregular sinusoid, which reduces the resistances of friction and the micro-deformations of the pellets. Such a solution is also optimised by the use of steel pellets as well as conventional lead pellets. Indeed, given the greater hardness of the steel pellet, the shape of the choke improves the distribution of the sprays and reduces the components that the pellet exerts towards the inside of the wall of the choke and of the barrel, in such a way reducing the possible deformations or lacquering of the barrels and of the choke itself.

Claims

1. Choke (2) for rifle barrels (3) comprising a cylindrical body that can be associated inside said barrel, having a first conical portion (21),
   characterised in that said first conical portion has a concave curvilinear profile (22) with respect to a longitudinal axis (X) of said barrel.

2. Choke according to claim 1, wherein said concave curvilinear profile is a parabolic profile.

3. Choke according to claim 1, further comprising a second portion (23) that fits downstream of said first portion having a terminal exit diameter (D) that is greater than or equal to the diameter (C) of the fitting portion (212).

4. Choke according to claim 3, wherein said second portion has a curvilinear profile.

5. Choke according to claim 3, wherein said second portion has a rectilinear profile.

6. Choke according to claim 4, wherein said curvilinear profile is a parabolic profile.

7. Choke according to claim 3, having a length of about 80 millimetres with a first portion having a length of about 70 millimetres.

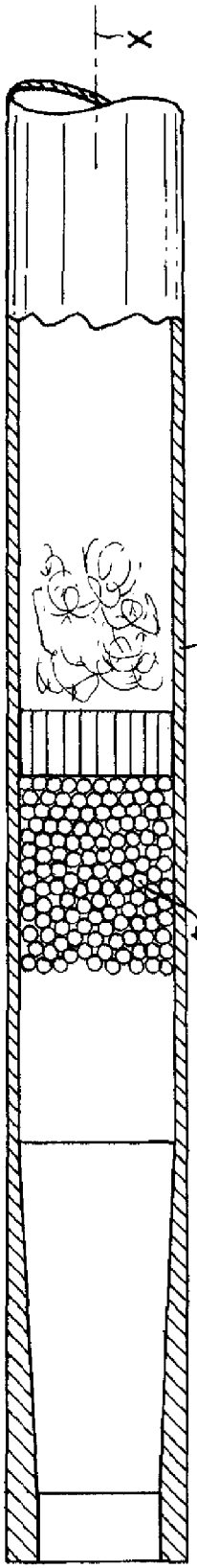


Fig.1
PRIOR ART

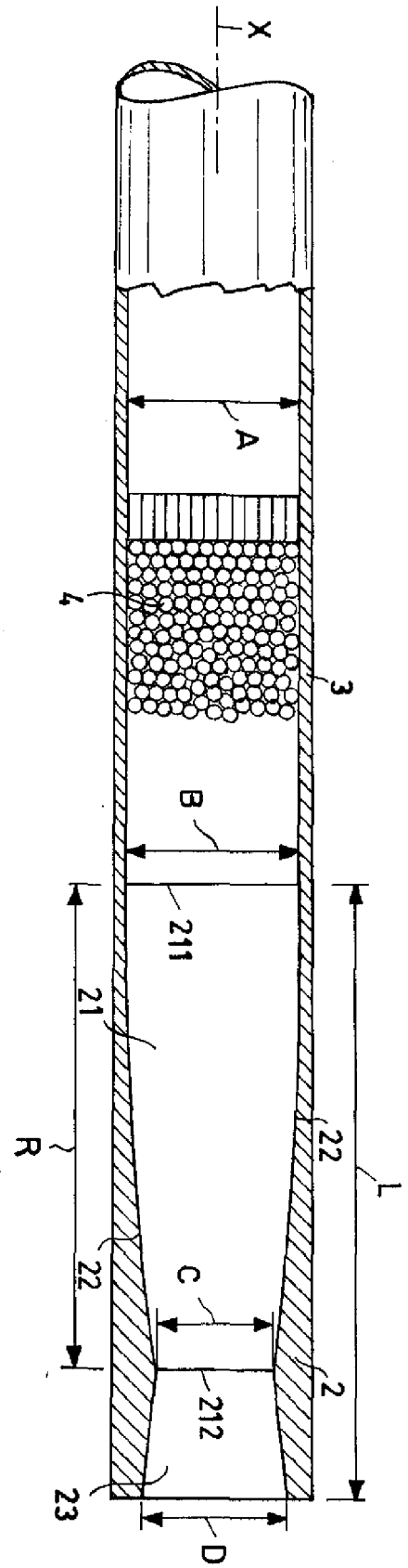


Fig.2