A joint between a suppressor and a barrel of a firearm. The joint includes an adapter that is secured to the muzzle of the barrel and that receives the suppressor. A connection element is arranged at the rear end part of the suppressor and fits the forward end part of the adapter. The connection element has a disc-shaped forward end part and a tubular rear end part that serves for fitting the forward end part of the adapter. A tube section is coaxially connected to the connection element with a forward end part and in contact with the forward end part of the adapter with a rear end part in the mounted position of the suppressor. The joint provides improved gas sealing and aligning of suppressor and barrel.
JOINT BETWEEN A SOUND SUPPRESSOR AND A BARREL OF A FIREARM

[0001] This application claims the benefit of provisional application No. 61/022,706 filed Jan. 22, 2008, the entire content of which is expressly incorporated herein by reference thereto.

BACKGROUND

[0002] The invention relates to a joint between a suppressor and a barrel of a firearm. The joint comprises a substantially cylindrical adapter defining an axis, said adapter has a rear end part coaxially secured to the muzzle of the barrel and a forward end part for receiving the suppressor, a through bore formed in the adapter in line with the bore in the barrel, and a connection element arranged at the rear end part of the suppressor and fits the forward end part of the adapter.

[0003] It is well known that firearms create a high volume of noise upon firing. This noise makes it easy to locate the position of the marksman with the fatal effect that the marksman himself could be a target. Another serious inconvenience consists in that the noise could damage the hearing of the marksman. Suppressors therefore are used for reducing the noise at least sufficiently. Such suppressors are mounted to the barrel of the firearms in many different ways.

[0004] A suppressor aﬀects however the operation of the respective firearm with regard to the precision of the firing when the through opening of the suppressor is not suﬃciently in line with the through bore of the barrel. The suppressor conventionally is assembled with the outside of the barrel or on the outside of an adapter attached to the barrel. This assembling method causes however diﬃculties in keeping the through bore of the suppressor suﬃciently in line with the through bore of the barrel. Also, such connection is diﬃcult to seal suﬃciently with the unfavourable result that gunpowder dust and fouling easily could be blown out of the connection and up into the face of the marksman firing a bullet, thereby harming the marksman and making him more or less unﬁt for operating the firearm with the preciseness required.

[0005] US patent application 2007/0095198 discloses an arrangement for attaching a suppressor to an enlarged end portion of the barrel of a firearm by means of an outside connection. This known arrangement involves a slow and troublesome operation of attaching the suppressor on the muzzle of the barrel of a firearm. The arrangement is moreover complicated and costly to produce and maintain. Thus, improvements in these type devices are needed.

SUMMARY OF THE INVENTION

[0006] The disadvantages and drawbacks of the above-mentioned known technique is remedied by providing a joint in accordance with the present invention. In a first aspect, the joint is used for attaching a suppressor to a barrel of a firearm, in which the gas sealing between the suppressor and the barrel is more effective than hitherto known. In a second aspect, the attachment is made by means of which the through opening of the suppressor is exactly in line with the through opening of the barrel. In a third aspect of the invention, the joint connects and enables the suppressor to be securely retained on the barrel of a firearm and can easily be removed when necessary or desired. In a fourth aspect, the joint allows the suppressor to be easily and quickly attached to a barrel of a firearm. In all these embodiments, the joint has a simple construction and is inexpensive to produce.

[0007] The new and unique way in which the present invention fulfills the above-mentioned aspects relates to the construction of the joint. The joint includes a connection element that has a disc-shaped forward end part and a tubular rear end part, with the tubular rear end part of the connection element coaxially fitting and receiving the forward end part of the adapter. A through bore is formed in the disc-shaped forward end part of the connection element coaxially with the tubular rear end part. A tube section is coaxially attached to the connection element with a forward end part in contact with the forward end part of the adapter and with a rear end part in the mounted position of the suppressor.

[0008] By means of this construction it is advantageously obtained that the through bore of the suppressor is exactly in line with the through bore of the barrel in the mounted position of the suppressor, and that the joint simultaneously is effectively sealed against discharging of e.g., gunpowder dust and fouling.

[0009] According to the present invention the rear end part of the tube section can extend into the through bore of the adapter whereby the through opening of the suppressor effectively can be lined up with the through opening of the barrel. Moreover, in an especially advantageous embodiment of the joint according to the present invention the forward part of the through bore of the adapter can be conical and the rear end part of the tube section can have a corresponding conicity whereby the tube section automatically is lined up and sealingly mounted in the through bore of the adapter when mounting the suppressor onto the adapter.

[0010] The conical part of the through bore could e.g. have an inclining angle of 8° to 14° and in an preferred embodiment the inclination could be 10° to 12°. The forward end part of the tube section can, according to the present invention, be attached to the through bore of the disc-shaped forward end part of the connection element by means of an outer thread on the tube section and an inner thread in the through bore of the forward end part of the connection element. By means of this arrangement the suppressor can easily and quickly be mounted on the adapter.

[0011] Another advantage consists in that the axial position of the tube section can be adjusted to the actual geometry of the joint by screwing the tube section in or out of the forward end part of the connection element. The securing of the suppressor to the adapter can in an expedient embodiment according to the present invention take place by turning the suppressor in relation to the adapter in the opposite direction of the direction in which the outer thread of the tube section is screwed into the inner thread of the disc-shaped forward end part of the connection element. Thus, when the tube section is screwed out of the suppressor when turning this in the securing direction, the conical rear end part of the tube section is automatically driven against the conical forward part of the through bore of the adapter with a relatively large force resulting in that the joint is being safely sealed.

[0012] The suppressor is dismounted by turning it in the opposite direction of the mounting direction whereby the tube section now is screwed into the suppressor end, and the tight connection between the two conical surfaces of the adapter and the tube section is easily released.

[0013] The adapter can, according to the present invention, be provided with a ring-shaped groove and at least one projection on the inner side of the tubular rear end part of the
connection element engaging said ring-shaped groove in the mounted position of the suppressor. Furthermore, the adapter may advantageously be provided with a longitudinally extending slot, arranged so that the at least one projection on the tubular rear end part of the connection element fits slid ingly into this slot.

[0014] The suppressor is then mounted on the adapter by sliding the tubular rear end part of the connection element axially along the adapter with the at least one projection in engagement with said longitudinally extending slot and at the end of the slot turning the suppressor in relation to the adapter so that the at least one projection engages said ring-shaped groove. The suppressor now is securely fastened to the adapter. The suppressor can be easily dismounted by simply reversing the above-mentioned mounting steps.

[0015] According to the present invention the adapter can in one embodiment be formed as a tube only, but in another embodiment the adapter can be formed as a flash hider directing hot escaping gases from the barrel end and reducing the visibility of the blazing muzzle flash which occurs upon firing. According to the present invention a large variety of suppressors could be mounted onto a barrel or flash hider using the present joint e.g. a flash hider used on M16 series rifles.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention will be explained in greater detail below describing further advantageous properties and example embodiments with reference to the drawings, in which

[0017] FIG. 1 shows schematically a fragment of an axial section of a barrel of a firearm being mounted with a suppressor.

[0018] FIG. 2 shows a cross section of the same taken along the line II-II in FIG. 1.

[0019] FIG. 3 shows a cross section of the same taken along the line III-III in FIG. 4; and

[0020] FIG. 4 shows schematically a fragment of an axial section of the barrel shown in FIG. 1 with the suppressor in mounted position on the barrel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] FIGS. 1-4 show a joint 1 between a barrel 2 of a firearm (not shown) and a suppressor 3. The barrel and the suppressor are shown in fragments only.

[0022] The barrel is formed with a reduced muzzle 4. A rear end part 5 of an adapter 6 with a mainly cylindrical outer outline, is firmly attached to said muzzle. A forward end part 7 of the adapter is arranged for removable receiving the suppressor 3. The suppressor 3 is supported by the forward end 7 of the adapter 6 in order for the suppressor 3 not to be misaligned.

[0023] The adapter is moreover formed with a through bore 8 with a conical forward end part 9, three longitudinally extending slots 10 and a ring-formed groove 11. The suppressor has an elongated forward part 12 having inter alia an expansion chamber and a number of baffles (not shown) and a rear end part in form of a connection element 13 for mounting the suppressor on the forward end part of the adapter.

[0024] The connection element 13 has a disc-shaped forward end part 14 and a tubular rear end part 15 coaxially fitting the forward end part of the adapter. A through bore 16 is formed in the disc-shaped forward end part 14 of the connection element 13 coaxially with the tubular rear end part. An inner thread 17 is formed in said through bore 16.

[0025] A tube section 18 has a forward end part 19 and a rear end part 22. The forward end part 19 is formed with an outer thread 21 fitting the inner thread 17 formed in the through bore 16 of the disc-shaped forward end part 14 of the connection element 13. The rear end part 22 of the tube section 18 is formed as a cone with the same conicity as the conical forward end part of the through bore in the adapter. The conical inclinations could e.g. be 8° to 14° but it is preferred that the match each other in order to ensure at sealingly tight fit. The inner side of the tubular rear end part of the connection element is formed with three projections 23 fitting the three longitudinally extending slot and ring-formed groove formed in the adapter.

[0026] The suppressor 3 is mounted onto the adapter 6 in the following way. The tube section 18 is screwed somewhat in or out of the forward end part 14 of the connection element 13 until the axial position of the tube section fits the actual geometry of the joint 1. The tubular rear end part 15 of the connection element 13 then is moved slidingly along the adapter with the three projections 23 in engagement with the longitudinally extending slots 10. The suppressor is, when arriving the end of the slots, turned in relation to the adapter so that the projections engage the ring-formed groove 11. The suppressor now is securely fastened to the adapter.

[0027] The securing turning of suppressor takes place in one direction while the tube section is screwed into the disc-shaped forward end part of the connection element in the opposite direction whereby the conical rear end part of the tube section automatically is driven against the conical forward part of the through bore of the adapter with a relatively large force resulting in that the joint safely is being sealed. If the joint seems to loose for the operator of the firearm it is possible to adjust the tubular section 18 in relation to the connection element 13 of suppressor 3. Thereby, the tightness of the fit between the conical part 22 of the tube section 18 and the conical part 9 of the adapter is ensured. Visa versa the fit could be loosened if found too tight.

[0028] The two conical surfaces 9 and 22 of the adapter and the tube section, respectively, secure that the tube section automatically is lined up and sealed in the through bore of the adapter when mounting the suppressor onto the adapter. The suppressor is by dismounting turned into the opposite direction of the securing direction whereby the tube section now is screwed into connection element of the suppressor and the tight connection between the two conical surfaces of the adapter and the tube section safely is released, that means without damaging the joint in any way.

[0029] In the embodiments shown in FIG. 1-4, the adapter is formed as a flash hider for directing hot escaping gases from the barrel end and reducing the visibility of the blazing muzzle flash which occurs upon firing. The flash hider is formed with a number of slits 24 extending radially outwards from the through bore of the adapter. The slits 24 can, within the scope of the present invention, have any suitable shape and exist in any suitable numbers. In the present case only one slit can be seen. This slit is debouching into the upper longitudinal extending slot 10. The slits 24 does however not need to debouch into the slot but can debouch in other areas of the flash hider, preferable in the upper part of the adapter for damping the tendency of the muzzle to move upwards when firing a bullet.
The present invention can be used with a wide variety of forearms. For example, M16 rifles are produced in various types and it is obvious that within the scope of the invention alterations could be made in order to use a tube section 18 for achieving a sealingly tight fit between an adapter e.g. a flash hider or flash suppressor and a sound suppressor or silencer.

Also, although a specific embodiment of the arrangement for mounting the sound suppression onto the adapter is described above, it is however to be understood as an example only since other arrangements of this kind just as well can be used within the scope of the invention. It is an essential aspect and feature of the invention that the suppressor is secured to the adapter by being turned in relation to the adapter.

What is claimed is:

1. A joint for connecting a suppressor to a barrel of a firearm, comprising:
   a substantially cylindrical adapter defining an axis, said adapter having a rear end part for coaxially securing a muzzle of the firearm barrel thereto and a forward end part for receiving the suppressor,
   a through bore formed in the adapter in line with the bore in the barrel,
   a connection element arranged at the rear end part of the suppressor for fitting to the forward end part of the adapter, the connection element having a disc-shaped forward end part and a tubular rear end part, with the rear tubular end part of the connection element coaxially fitting the forward end part of the adapter, and with a through bore present in the disc-shaped forward end part of the connection element coaxially aligned with the tubular rear end part, and
   a tube section coaxially attached to the connection element, with the tube section having a forward end part in contact with the forward end part of the adapter and a rear end part in the mounted position of the suppressor.

2. The joint of claim 1, wherein the rear end part of the tube section extends into the through bore of the adapter.

3. The joint of claim 1, wherein a forward part of the through bore of the adapter is conical and that the rear end part of the tube section has a corresponding conicity.

4. The joint of claim 1, wherein the forward end part of the tube section is attached to the through bore of the disc-shaped forward end part of the connection element.

5. The joint of claim 1, wherein the forward end part of the tube section has an outer thread and the disc-shaped forward end part of the connection element has a corresponding inner thread.

6. The joint of claim 5, which further comprises means for securing the suppressor to the adapter by turning the suppressor in relation to the adapter.

7. The joint of claim 6, wherein the securing means is arranged for turning in an opposite direction to that in which the outer thread of the tube section is screwed into the inner thread of the disc-shaped forward end part of the connection element.

8. The joint of claim 6, wherein the securing means comprises a ring-shaped groove formed in the adapter, and at least one projection on the inner side of the tubular rear end part of the connection element for engaging the ring-shaped groove in the mounted position of the suppressor.

9. The joint of claim 6, wherein the adapter has a longitudinally extending slot and that at least one projection on the tubular rear end part of the connection element fits slidingly into the slot.

10. The joint of claim 1, wherein the adapter is formed as a flash hider.

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