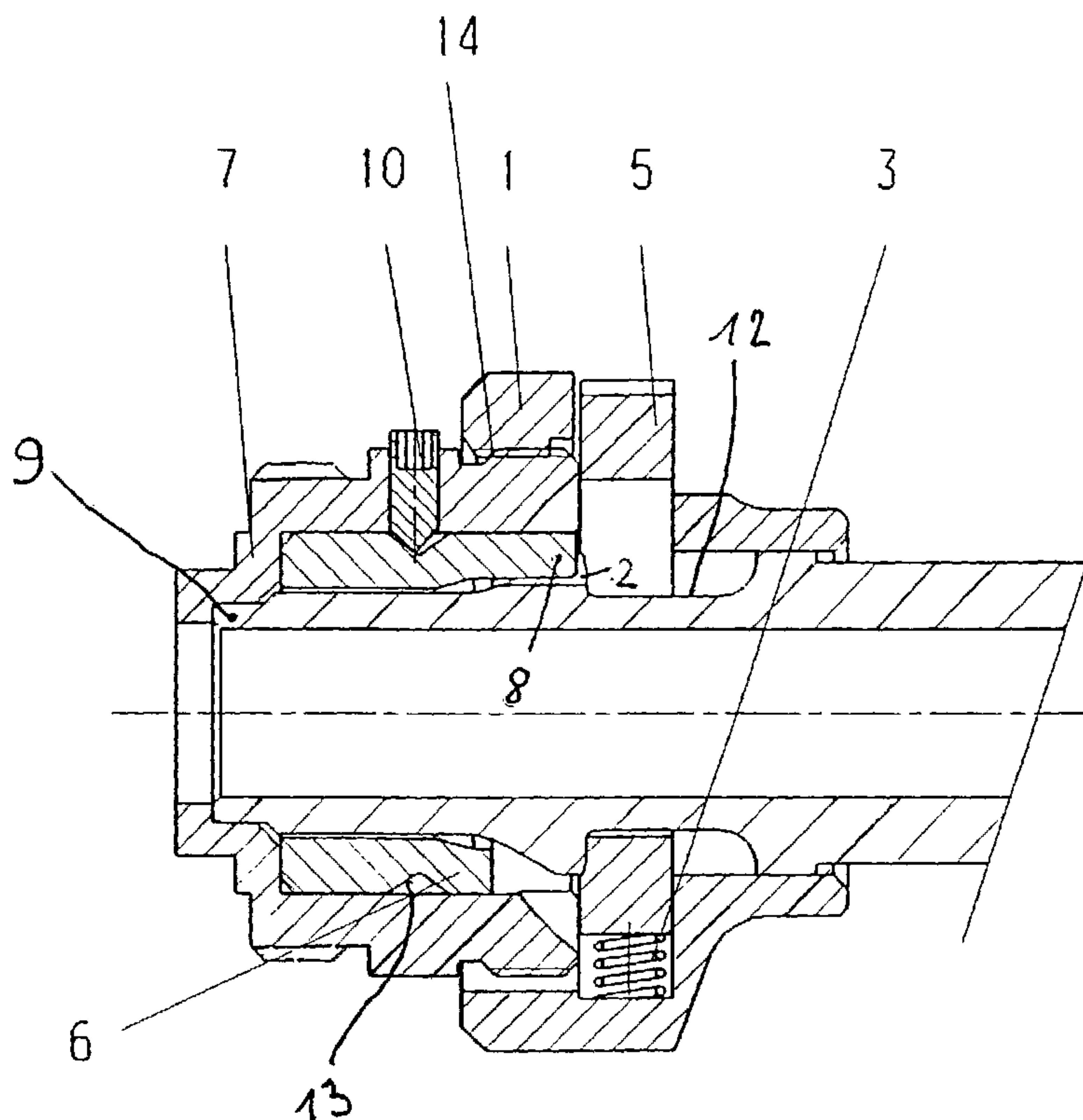




(86) Date de dépôt PCT/PCT Filing Date: 2000/12/06
 (87) Date publication PCT/PCT Publication Date: 2001/07/19
 (45) Date de délivrance/Issue Date: 2005/02/15
 (85) Entrée phase nationale/National Entry: 2002/07/12
 (86) N° demande PCT/PCT Application No.: EP 2000/012305
 (87) N° publication PCT/PCT Publication No.: 2001/051873
 (30) Priorité/Priority: 2000/01/14 (100 01 374.0) DE

(51) Cl.Int.⁷/Int.Cl.⁷ F41A 21/30, F41A 21/32
 (72) Inventeur/Inventor:
 FLUHR, NORBERT, DE
 (73) Propriétaire/Owner:
 HECKLER & KOCH GMBH, DE
 (74) Agent: RIDOUT & MAYBEE LLP

(54) Titre : FIXATION DESTINEE AU MONTAGE D'UN SILENCIEUX SUR LE CANON D'UNE ARME A FEU DE POING
 (54) Title: MOUNTING DEVICE FOR FASTENING A SILENCER TO THE BARREL OF A PORTABLE FIREARM



(57) Abrégé/Abstract:

The invention relates to a mounting device for fastening a silencer to the barrel of a portable firearm. The mounting base (7) of a silencer is provided with a part (7) that can be twisted around the axis of the bore with respect to the barrel (9) and a stationary part (6). The aim of the invention is to provide a mounting device with which the effects of the silencer on the shot placement consistency of the pertaining arm can be compensated. To this end, the silencer is twisted from shot to shot when the arm is tested. In the position of twist that is found to be optimal, the part (7) that can be twisted and the stationary part (6) are firmly interlinked so that the angle of rotation of the silencer with respect to the barrel (9) is always the same every time the silencer is mounted on the arm.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro(43) Internationales Veröffentlichungsdatum
19. Juli 2001 (19.07.2001)

PCT

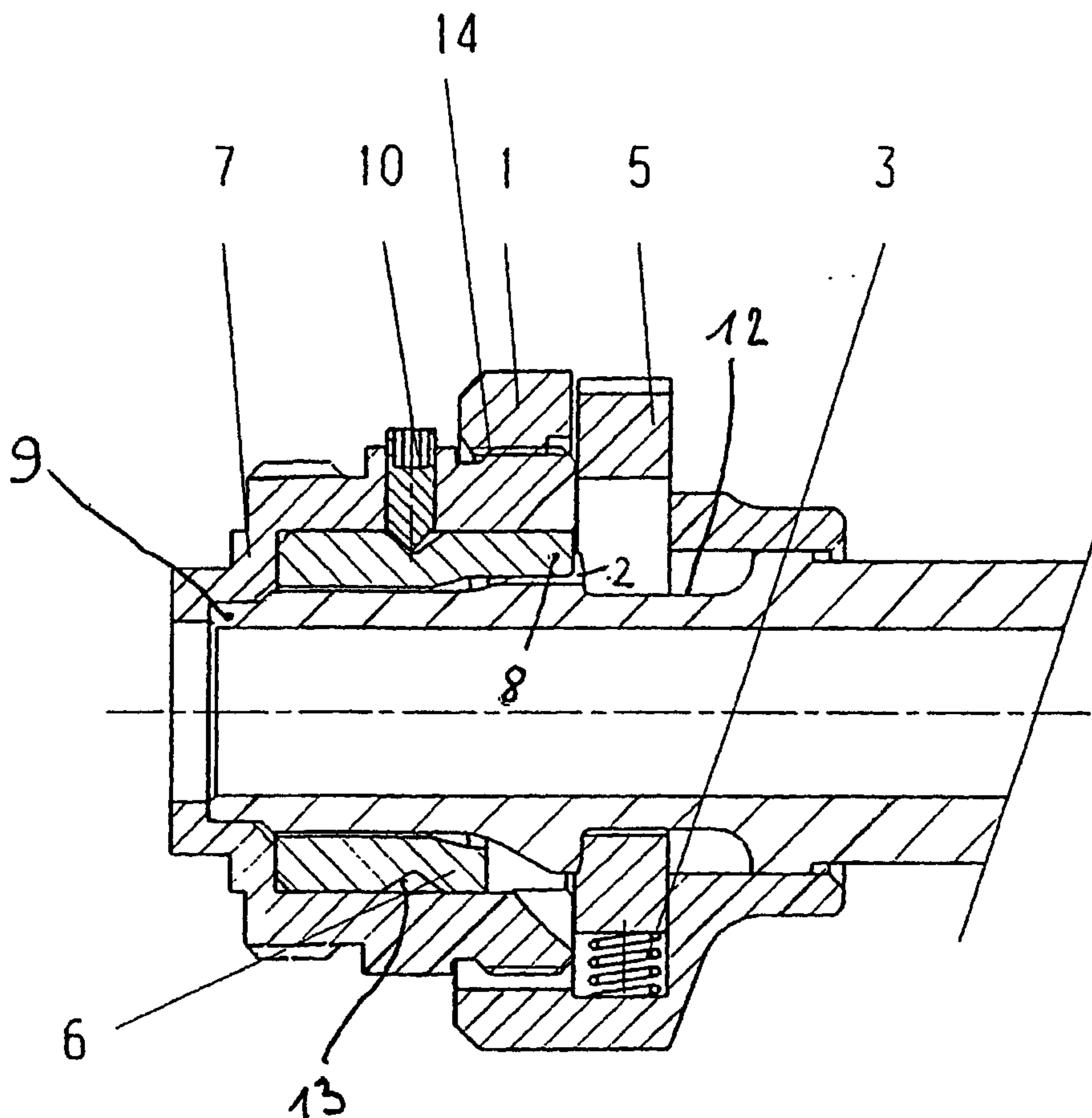
(10) Internationale Veröffentlichungsnummer
WO 01/51873 A1

- (51) Internationale Patentklassifikation⁷: F41A 21/30, 21/32 (71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): HECKLER & KOCH GMBH [DE/DE]; Alte Steige 7, 78727 Oberndorf/Neckar (DE).
- (21) Internationales Aktenzeichen: PCT/EP00/12305 (72) Erfinder; und
- (22) Internationales Anmeldedatum: 6. Dezember 2000 (06.12.2000) (75) Erfinder/Anmelder (nur für US): FLUHR, Norbert [DE/DE]; Brandeckerstrasse 61, 78727 Oberndorf (DE).
- (25) Einreichungssprache: Deutsch (74) Anwälte: VON SAMSON-HIMMELSTJERNA, Friedrich, R. usw.; Samson & Partner, Widenmayerstrasse 5, 80538 München (DE).
- (26) Veröffentlichungssprache: Deutsch
- (30) Angaben zur Priorität: 100 01 374.0 14. Januar 2000 (14.01.2000) DE (81) Bestimmungsstaaten (national): CA, US.

[Fortsetzung auf der nächsten Seite]

(54) Title: MOUNTING DEVICE FOR FASTENING A SILENCER TO THE BARREL OF A PORTABLE FIREARM

(54) Bezeichnung: HALTERUNG ZUR BEFESTIGUNG EINES SCHALLDÄMPFERS AM LAUF EINER HANDFEUERWAFFE



(57) Abstract: The invention relates to a mounting device for fastening a silencer to the barrel of a portable firearm. The mounting base (7) of a silencer is provided with a part (7) that can be twisted around the axis of the bore with respect to the barrel (9) and a stationary part (6). The aim of the invention is to provide a mounting device with which the effects of the silencer on the shot placement consistency of the pertaining arm can be compensated. To this end, the silencer is twisted from shot to shot when the arm is tested. In the position of twist that is found to be optimal, the part (7) that can be twisted and the stationary part (6) are firmly interlinked so that the angle of rotation of the silencer with respect to the barrel (9) is always the same every time the silencer is mounted on the arm.

[Fortsetzung auf der nächsten Seite]



WO 01/51873 A1



(84) Bestimmungsstaaten (regional): europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Zur Erklärung der Zweibuchstaben-Codes, und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Veröffentlicht:

— mit internationalem Recherchenbericht

(57) Zusammenfassung: Der Montagesockel (7) eines Schalldämpfers weist einen gegenüber dem Lauf (9) um dessen Seelenachse verdrehbaren (7) und einen unverdrehbaren (6) Teil auf. Um die Auswirkung des Schalldämpfers auf die Treffpunktlage der zugehörigen Waffe zu kompensieren, wird der Schalldämpfer beim Einschießen von Schuß zu Schuß verdreht. In einer als optimal ermittelten Drehlage werden das verdrehbare (7) und das unverdrehbare (6) Teil fest miteinander verbunden, so daß beim jedem erneuten Aufsetzen des Schalldämpfers auf die Waffe die gleiche Drehwinkellage des Schalldämpfers in Bezug auf den Lauf (9) erreicht wird.

WO 01/51873

PCT/EP

1

Mounting device for Fastening a Silencer onto the Barrel of a Handgun

The invention concerns a mounting device for fastening a silencer onto the barrel of a handgun, with

- an essentially tube-shaped silencer,
- a mounting socket attached to the back end of the silencer, and
- a gun muzzle that fits the mounting socket, to which the mounting socket can be affixed.

Such a mounting device is described in German patent application 199 35 929, whose entire content in this regard is the same as the preceding information.

In addition, DE 42 31 183 Cl is considered to be the state of the art.

On this mounting device, the outer surface of the muzzle has a groove around it. The mounting socket has a bar across it. When the mounting socket is pushed onto the muzzle, the bar snaps into the groove and secures the silencer in place. The silencer and its mounting socket can be rotated after they are attached to the muzzle.

The mounting device can also be constructed so that it will fit on existing gun barrels whose muzzles were not designed with the goal of accommodating a silencer. The mounting socket then encircles the base of the front sight, somewhat like a bayonet. In this case, the mounting socket and silencer cannot be rotated around the muzzle. Unique manufactures a silencer of this type.

In the simplest version, the mounting device has a threaded connection, with a male thread on the front end of the muzzle and a female thread in the mounting socket. In this case, the mounting socket (once it is screwed onto the muzzle) and silencer cannot be rotated around the muzzle. Parker & Hale manufactures such a silencer.

It is known that attaching a silencer to a handgun changes the bullet impact point. First, the barrel's oscillation behavior is altered, and in addition, the lengthwise axis of every barrel and silencer assembly has an individual deviation from true round. The silencer's deviation from round also influences the flight path of a bullet.

An advantage of the invention is that it reduces or eliminates the deviation in bullet impact point caused by attaching a silencer mounting device. It should always be possible to achieve the optimum impact point, even when the silencer is removed from the gun and then replaced with no particular attention.

The invention according to the content of Claim 1 does not have this advantage.

Tests with the previously described silencer mounting device, which can be rotated around the muzzle, surprisingly showed that the deviation in bullet impact point can be minimized by rotating the assembly. For every silencer and every gun to which it is attached, there is an optimum individual angle of rotation between the silencer's and muzzle's relative angle of rotation ranges, where the impact point deviation is particularly small. The altered oscillation behavior and deviation from round probably come closest to compensating for each other at this optimum angle location.

In one possible execution form, the silencer and mounting socket are first placed on the barrel and then rotated until they snap into place on the barrel. The piece attached to the muzzle cannot rotate around it, but the silencer, or the part on the mounting socket that holds it, is easily attached to that piece and can rotate around it.

Now the gun's range is found, by measuring the bullet impact point with the silencer rotated to various positions and thereby determining the optimum bullet impact point. This range-finding procedure can easily be accomplished using a range-finding device. This also shows why the silencer should be essentially tube-shaped, because a silencer that is significantly asymmetrical with respect to the axis of the bore would weight the gun inconsistently in the various rotation positions, which would cause additional difficulties during the range-finding process.

When the optimum bullet impact point has been determined, then the silencer or the part on the mounting socket that holds the silencer can be attached to the non-rotating part in such a way that, even under heavy use, it will not rotate further. The silencer and the gun are now adjusted to each other.

Once the range for the gun and silencer together has been found, the same gun and silencer must then be used together, which requires a clear marking system such as matching numbers. If the gun and silencer are delivered to the same individual customer, they will automatically stay together. If necessary, the range with the silencer can easily be found again, just as it can for the gun itself after a major repair or for a similar reason.

The invention thus succeeds in making the bullet impact points with and without the silencer match each other, without requiring any greater precision when the silencer is manufactured.

The previously mentioned rotating silencer mounting device can also be constructed in such a way that the part of the mounting socket fastened to the silencer includes a rotating housing, which attaches to the muzzle with a preferably axial tongue-and-groove connector after it is slid onto the muzzle and does not rotate (Claim 2).

This housing is the non-rotating part of the mounting socket, around which the part that holds the silencer can be attached and rotated.

The housing has an exceptionally simple tongue-and-groove connector consisting of a protrusion extending backward, asymmetrical to the housing, which engages in a lengthwise groove on the muzzle (Claim 3). Beveling the side edges of the protrusion and lengthwise groove and rounding the corners makes it exceptionally easy to slide the housing onto the muzzle.

The part of the mounting socket that holds the silencer preferably seals around the muzzle and can in turn be rotated when attached (Claim 4, attachment to part (7)). This part of the mounting socket also corresponds to the mounting socket of the previously mentioned mounting device. The aforementioned housing does not reduce the power when shooting, and therefore it can also encircle the barrel with some play. If it is clamped tight and therefore slightly distorted, it still does not press on the barrel and therefore does not create a new oscillation point. In addition, the housing's inner surface can be manufactured with less surface finishing and therefore more cheaply.

The space between the housing's inner surface and the muzzle's outer surface therefore connects to the sealing area between the part of the mounting socket that holds the silencer and the muzzle, and creates an expansion space in case of a leak.

According to one preferred method of executing the invention, there is a radial set screw in the part of the mounting socket that holds the silencer, and its end engages a rounded groove in the outer surface of the housing (Claim 5). The set screw can be hardened and the housing can be constructed of a relatively soft material, such as aluminum, so that the set screw "digs into" the housing slightly when it is tightened.

The set screw should preferably be a socket hex screw, because more tightening and loosening torque can be applied to such a screw. When the silencer is calibrated, the set screw can be secured by a drill bit or center punch mark, so that it cannot lock by itself, for example when the gun is fired. For this application, the set screw should be headless.

The invention will now be explained using an application example. The schematic drawing included in the attached figure shows a lengthwise section cut through the muzzle area of a barrel with the mounting socket installed.

The drawing shows a schematic lengthwise section cut through the muzzle area of a barrel 9; the shooting direction ("forward") is facing left. Over the barrel 9, a silencer holder 7 has been slid on from front to back, and the outer tube of a silencer (not shown) has been screwed onto the holder. The silencer holder 7 contacts the front end of the muzzle on the barrel, forming a seal. From back to front, a sleeve 1 is screwed tightly onto an outer fine thread 14 and can be fixed there if desired. A cross-slide 5 is attached to the sleeve 1 and is pushed radially outward by a pressure spring 3. The cross-slide 5 contacts the barrel 9 and is pressed by the spring 3 into a groove 12 around the outer surface of the barrel 9. This causes the beveled front surface of the cross-slide 5 to make firm contact with the front side edge of the groove 12 around the barrel, which ensures that the silencer holder 7 stays securely fastened to the barrel 9.

The assembly described above corresponds essentially to the silencer holder covered by the aforementioned German patent application 199 35 929. The silencer holder 7 can be rotated on the barrel 9 when attached, along with the silencer, the sleeve 1, and the cross-slide 5.

Inside of the silencer holder 7 and coaxial to it, a cylindrical housing 6 is attached, which has an axial protrusion 8 on its back face. Said protrusion engages in a lengthwise groove 2, which contacts a round raised area on the outer surface of the barrel 9.

In the area shown, when the silencer holder 7 is installed and secured, the housing 6 does not rotate on the barrel 9, because the protrusion 8 engages in the groove 2 and prevents the housing 6 from moving.

A female thread goes through the wall of the silencer holder 7, and a headless hex socket screw 10 is screwed into it. This screw 10 has a tapered point that engages a groove 13 around the outer surface of the housing 6. Therefore, the groove 13 has the same diameter as the tapered point of the screw 10, but it is placed slightly backward with respect to the screw, so that the screw 10 does not press the housing 6 forward when it is screwed in, so that the housing 6 contacts the inner shoulder of the silencer holder 7 with a strong friction force. At the same time the screw 10 is loaded crosswise, so that a strong friction force is also applied to its threads to secure it. In addition, the screw 10 can be locked in place with a center punch mark.

For calibration, the silencer holder 7 is placed on the barrel 9. The screw 10 is secured. Then multiple shots are fired with the silencer holder 7 placed at different angles of rotation relative to the barrel 9. At the angle of rotation setting that results in the best shooting performance, more shots are fired with only very slight changes to the angle of rotation, until a satisfactory bullet impact point is achieved.

Then the screw 10 is tightened down, and after a final test shot, it is permanently secured.

If the silencer with the silencer holder 7 is removed and then reinstalled, it will have the same angle adjustment as after it was calibrated.

Patent Claims

1. Mounting device for fastening a silencer to the barrel (9) of a handgun, with
 - an essentially tube-shaped silencer,
 - a mounting socket attached to the back end of the silencer (7), and
 - a gun muzzle (9) that fits the mounting socket (7), to which the mounting socket (7) can be affixed,where:
 - the muzzle (9) has a non-round protrusion (2),
 - the mounting socket has a matching part (6) with a counterpart (8) that complements the non-round protrusion (2), so that the matching part (6) can only be fastened onto the muzzle (9) at a preset angle of rotation,
 - the attached silencer can be rotated with respect to the matching part (6), and
 - a permanent securing device (10) is included, which attaches the silencer to the matching part (6) at a selected angle of rotation, in such a way that it cannot be rotated.
2. Mounting device as in Claim 1, distinguished in that the matching part is constructed as a housing (6), which goes into the mounting socket (7) and can be rotated there, and which is attached to the muzzle (9) with a tongue-in-groove connection (2, 8) and cannot be rotated after it is secured.
3. Mounting device as in Claim 2, distinguished in that the housing (6) has a protrusion (8) that extends asymmetrically backward and engages in a lengthwise groove (2) in the muzzle (9).
4. Mounting device as in Claim 2 or 3, distinguished in that the part (7) of the mounting socket (7) attached to the silencer seals around the muzzle (9) and can rotate while secured to it, and that the housing (6) encircles the muzzle (9) with some clearance and can be secured around the part (7) attached to the silencer.
5. Mounting device as in Claim 4, distinguished in that a radial set screw (10) is screwed into the part (7) attached to the silencer, and said set screw (10) engages in a groove (13) around the outer surface of the housing (6).

[drawing]

