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(54) **PUTTY KNIFE**

KITTMESSER

COUTEAU À MASTIC

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(72) Inventor: **Kolesnik-Nykiel, Piotr**  
**80-180 Gdansk (PL)**

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(74) Representative: **Czabajski, Jacek**  
**TRASET Czabajski i Partnerzy Rzecznicy Patentowi i Radcowie Prawni Sp.p.**  
**ul. Szymanowskiego 4**  
**80-280 Gdansk (PL)**

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(73) Proprietor: **Grupa Narzedziowa Solid Sp. z o.o. Sp. komandytowa**  
**83-031 Legowo (PL)**

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## Description

**[0001]** The subject of the invention is a putty knife intended for use in construction works, such as filling and smoothing of missing wall materials, initial surface levelling or surface cleaning by coating removal. Putty knives are also used in finishing works, mainly at the stage of the final application, modelling and final surface levelling.

**[0002]** A solution described in FR2969192B1 is known in the field, which discloses a blade for coating and application, with a catching unit containing a support forming the working part together with the first side and the second side, wherein the sides are tilted at an angle determined by the user. The blade is removable and foldable, such that it forms the first side and the second side, which is tilted at an angle set by the user, similar to the angle of the supporting part. The first side of the catching unit is placed on the outer side of the product applying blade. The second side of the catching unit fixes the second side of the blade. The second side of the blade is used to apply the product.

**[0003]** Another solution is known from the FR3020389 document, which discloses a tool including an elongated smoothing element intended for spreading and smoothing of render and a support, to which the elongated smoothing element is attached. The support includes a part intended for affixing a holder including two chucks intended for clamping the affixing part. The chuck is provided with functional elements intended for moving the chuck, once attached. These elements adapted to connecting or moving the chucks remotely, while the affixing part has a circular cross-section in a plane virtually perpendicular to the length of the blade.

**[0004]** Another solution is known from the international application WO0032893, which discloses a smoothing rack intended for attachment on an elongated handle, one end of which is provided with a cylindrical head supporting the blade. The head is provided with a flange and a lever arm on one end, intended for connection with the handle, and a pair of strictly opposite pads and a rotating pin on the other end, intended for coupling with the blade supporting plate. The support catching the base of the blade is attached to the supporting plate. The plate is wide and flexible, and protrudes away from the support, at a right angle to the longitudinal axis of the knife handle. The blade is curved away from the blade support at a right angle, such that the plane of the working edge of the blade is parallel to the longitudinal axis of the handle.

**[0005]** The next known solution comes from the European patent EP2471608, which discloses a putty knife with a rear part for fixing a handle, a blade handle and a blade, wherein the blade is made of a thermoplastic polymer with hardness between 45 and 75 degrees in the Shore scale. The thermoplastic polymer is selected from thermoplastic polyurethanes and thermoplastic olefin polymers. Rigid plastics include high-density polyethylene, polypropylene or PVC. Two sides of the blade are smooth surfaces used to smooth varnish coatings.

**[0006]** Another solution is known from the GB2456613 patent document, which discloses a knife for skimming, filling or stripping for example that has an adjustable head, where the position of the head in respect to the handle of the knife is adjustable. The adjustment means are two pivotal joints located between the handle and head of the skimming/filling knife forming a double knuckle joint. The joints may be tightened via a screw and fly nut to lock the joint in one position. The handle may be hollow and accommodate a longer handle/tube to allow the user to use the device at higher levels.

**[0007]** There are also known other solutions similar to the present invention, but different from it in terms of technical features, namely patent documents JPH11198063 CN205742917 and US2002078518.

**[0008]** The objective of the invention is to provide an economic model of a construction putty knife, the working elements of which, subject to natural wear and tear, may be fully replaced and their design includes as small number of elements as possible. The main design element according to the invention is a blade with an assembly profile. The design of the putty knife according to the invention is intended to be disassembled to the maximum possible degree. The ability to remove individual design elements was ensured by the use of an assembly kit in the form of a bolt with a butterfly nut, with the kit directly cooperating with openings provided in the main elements of the putty knife design. This design solves the main problem with previously known solutions - mitigates the issue of spare parts unavailability to the minimum degree.

**[0009]** The solution according to the invention is a putty knife with a metal blade and a handle placed inside a connector, wherein the connector is an angle-adjusted, removable connection between the handle and the fixing profile, in which the working blade is placed.

**[0010]** The connector includes a support, which is flat in the connection area with the flat profile fixing the blade, where the support is connected to the blade fixing profile, using connectors. The connector is provided with a socket with an opening for the element connecting the connector with the handle. The handle is provided at the end with a socket cooperating with the connector socket using a said fixing element. Sockets are provided with complementary, radial protrusions at cooperating contact surfaces of these sockets.

**[0011]** According to the invention, the construction putty knife is characterised in that the radial protrusions at the socket contact surfaces have triangular cross-section, wherein the putty knife support is preferably provided with stiffening elements in the form of ribs.

**[0012]** The putty knife support has an aperture intended to introduce the fixing profile.

**[0013]** The blade fixing profile and the connector are preferably provided with at least two cooperating openings.

**[0014]** Thanks to the use of universal sizes of the assembly openings and the elements of the assembly kit,

the putty knife according to the invention is a flexible construction tool. The blade, namely the part subject to natural wear and tear, is removable and can be fully replaced. A blade with a specific length may be replaced with a longer or a shorter blade, as necessary. The other part of the putty knife comprising an adjustable connector and a handle is a reusable tool, with the option of replacing only the used blade is provided. The universal sizes as well as the ability to adjust the angle at which the putty knife handle is set against the connector with a fixed blade, allows adjustment of the angle of incidence of the putty knife against the wall, onto which the filler coat is applied using the putty knife. This enables the use of a long putty knife handle for application of the coat at high parts of the walls, which require adjustment of the angle between the handle and the putty knife blade plane in order to achieve the correct angle of incidence of the putty knife blade against the wall. In the previously known solutions, the putty knife modules include a set of permanently connected elements, such as the blade and the handle, for which the connector with the handle is an additional accessory.

**[0015]** The use of the construction putty knife according to the invention also allows the blade itself to be executed as a replaceable element, wherein it is a consumable part requiring less material than the entire putty knife. The replacement cost of the blade itself is significantly lower than the purchase of the complete putty knife, in which various connectors were an additional, functional accessory. In addition, the metal blade and the assembly kit made of metal make the design eco-friendly, as a product fully recyclable after blade replacement.

**[0016]** The design of the putty knife according to the invention additionally enables the use of a varied length handle with the option of changing the angle of incidence against the rendered surface by loosening the connecting screw, rotation on the radial protrusions of the sockets and connecting the sockets together again with the blade in the new position.

**[0017]** The object of the invention is presented in an embodiment in the attached drawing, in which individual figures of the drawing represent as follows:

- Fig. 1 - a connector including a support with the assembly aperture, the head and reinforcing ribs,
- Fig. 2 - a connector according to Fig. 1 in a different embodiment,
- Fig. 3 - a blade with a fixing profile, in a side view, according to the blade plane,
- Fig. 4 - a blade with a fixing profile, in a top view,
- Fig. 5 - the construction putty knife in an axonometric view,

Fig. 6 - a complete putty knife, in a side view,

Fig. 7 - a putty knife in a bottom view,

5 Fig. 8 - the head placed inside the handle, when looked towards the radial protrusions,

Fig. 9 - the head placed inside the handle, in an axonometric view,

10 Fig. 10 - the head placed outside the handle, when looked towards the radial protrusions,

15 Fig. 11 - the head according to Fig. 10 viewed from the other side,

Fig. 12 - the head placed on the putty knife handle, in an axonometric view.

20 **[0018]** Fig. 1 and Fig. 2 present the connector 4, comprising an element connecting the blade 2 shown in Fig. 3 and Fig. 4 with the handle 3, the end part of which is shown in Fig. 8 to Fig. 12. These Figures show only the part of the handle 3 cooperating with the connector 4 because of the fact that one of the tasks of the invention is to use the handle 3 with a significant length, enabling the use of the putty knife at higher parts of walls of a building without the use of a ladder. Thus, the Figures show only the part of the handle 3 cooperating with the connector 4 in order to clearly present the unit connecting the connector 4 with the handle 3.

25 **[0019]** The work of a putty knife at various heights using the handle 3, the length of which may be variable or which may be held by the operator at various levels, within a wide range of heights, requires the blade 2 of the putty knife to be always set at the same or a similar angle against the wall in order to achieve the required quality of the render. Thus, when working on different heights, the angle at which the connector 4 with the fixing profile 5 fixing the blade 2 placed on it against the handle 3 must be different, according to the length of this handle 3 or to the level at which it is held by the operator.

30 **[0020]** Thus, a system of cooperating sockets 9.1 and 9.2 is provided in the solution according to the invention, at the point of connection between the handle 3 and the connector 4. Sockets 9.1 and 9.2 are provided on cooperating surfaces with complementary, radial protrusions 12 shown in Fig. 1, Fig. 2, Fig. 8 and Fig. 10 to Fig. 12. Once the connecting element 11 in the form of a bolt with a butterfly nut is loosened, the protrusions 12 enable to change the angle between the handle 3 and the connector 4, and finally, between the plane of the blade 2 and the wall, and after tightening this connecting element 11, they enable restoration of a stable connection between these two elements 9.1, 9.2, but at a different angle,

35 **[0021]** Fig. 3 and Fig. 4 show the blade 2 of a construction putty knife fixed permanently inside the fixing profile 5. The blade 2 is usually made of flexible steel sheet

enabling adaptation of the edge spreading the rendering mass on the wall in order to achieve a smooth effect. The blade 2 is provided with openings 14 in the fixing profile 5, as shown in Fig. 4, in order to facilitate blade attachment in the manual handle, not shown in these Figures, or to the (not shown in the Figures) support 6 of the connector 4. Openings 14 in the fixing profile 5 cooperate with openings 14 in the support plate 6, shown in Fig. 1 and Fig. 2. In this embodiment, attachment involves screwing the fixing profile 5 with the blade 2 to the support 6 of the connector 4 using connecting elements 8 in the form of bolts with butterfly nuts. This is shown in Fig. 5 and Fig. 6, as well as in Fig. 7, in a view towards the bottom surface of the blade 2.

**[0022]** The support 6 is shown in the attached Fig. 1 and Fig. 2, in two embodiments. In both embodiments, it comprises a flat element, to which the blade 2 fixed permanently in the fixing profile 5 is attached, as shown in Fig. 3 and Fig. 4. Openings 14 are made in the support 6, corresponding to openings 14 in the fixing profile 5 shown in Fig. 4. This flat element provided as support 6 is provided with stiffening ribs 7 shown in Fig. 1, Fig. 2 and Fig. 5. In other examples, outside of the scope of the present invention, if the replaced support 6 is made of a different material, not shown in the attached figure, it may not require the use of ribs 7. In the described embodiment, the support plate 6 is provided outside the ribs 7 with a circumferential stiffening 16 of two side edges, as well as of the rear edge, to which the socket 9.1 of the connector 4 is attached.

**[0023]** Fig. 1 and Fig. 2 show two different embodiments of the support 6. The embodiment of the support 6 in Fig. 1 is characterised in that the support panel 6 is provided with an aperture 13, into which the fixing profile 5 with the blade 2 is placed between placement inside the openings 14 of the connecting elements 8 provided as bolts with butterfly nuts, connecting the blade 2 with the connector 4. On the other hand, in the case of the support 6 presented in Fig. 2, the plate of the support 6 is not provided with an aperture 13 and in this embodiment of the construction putty knife 1, with the fixing profile 5 with the blade 2 screwed on to the plate of the support 6 through the openings 14, from the bottom side, using the aforementioned bolts.

**[0024]** The removable connections of the construction putty knife 1 use connectors 8 and 11 in the form of bolts with butterfly nuts. This is shown in Fig. 5. Such connections, with precisely tightened nuts, are stable connections, at the same time easy to loosen in order to change the angle between the plane of the support 6 and the handle 3, followed by stabilisation of this connection by re-tightening of the connecting element 11. On the other hand, the connecting elements 8 in the form of bolts with butterfly nuts enable easy replacement of a fixing profile 5 with a blade 2 without a use of tools, with a new and identical part, or with a fixing profile 5 with a blade 2 of a different type, for example with a blade 2 with a different length, if necessary.

**[0025]** Fig. 5, Fig. 6 and Fig. 7 present a complete, assembled construction putty knife 1 according to the invention. These figures show connected and cooperating surfaces of the socket 9.1 of the connector 4 and of the socket 9.2 of the handle 3, according to Fig. 1 and Fig. 2. The connection between surfaces 9.1 and 9.2 is particularly shown in Fig. 5 and Fig. 7. Fig. 6 shows that the support 6 is flat within the area of connection with the flat fixing profile 5 of the blade 2.

**[0026]** The subsequent Figs. 8 to Fig. 12 show the end of the handle 3 in two embodiments. Fig. 8 and Fig. 9, the hand 3 has a larger diameter and the invisible here pin of the socket 9.2 is placed inside the tube comprising the handle 3. This solution may be used with a shorter handle 3, thus with a smaller total weight. If the handle 3 is longer than 1.5 metre, however, its total weight is excessive and its diameter has to be decreased in order to decrease the overall weight. This requires the use of a socket 9.2 with a clamp 15 including the handle 3 inserted inside the clamp 15. This is shown in Figs. 10 to Fig. 12.

**[0027]** The attached figures show that complementary radial protrusion 12 are provided on the cooperating surfaces of the socket 9.2 of the handle 3 and of the socket 9.1 of the connector 4. This means that once the socket 9.1 shown in Fig. 1 and the socket 9.2 shown in Fig. 9 are combined and once the connection is tightened using the connecting element 11 in the form of a screw with a butterfly nut, as shown in Fig. 5 and Fig. 6 and Fig. 7, the radial protrusions 12 with a triangular cross-section mesh and complement one another, forming a cohesive and detachable connection. The connecting element 11 is passing through the openings 10 in the sockets 9.1 and 9.2. When the connecting element 11 is loosened, the connection can be disconnected and the handle 3 may be rotated around the connector 4 in order to achieve a different angle between the handle 3 and the blade 2 attached to the support 6. The connection of both those elements is then fixed at the adjusted angle, by pressing both sockets 9.1 and 9.2 together using the connecting element 11 in the form of the aforementioned screw with a butterfly nut, passing through openings 10 in the sockets 9.1 and 9.2.

#### Designations used in the figures

#### **[0028]**

1. Putty knife
2. Blade
3. Handle
4. Connector
5. Fixing profile
6. Support
7. Stiffening rib
8. Connecting element
- 9.1. Socket
- 9.2. Socket

- 10. Opening
- 11. Connecting element
- 12. Radial protrusion
- 13. Aperture
- 14. Opening
- 15. Clamp
- 16. Circumferential stiffening

### Claims

1. A putty knife with a metal blade, a flat fixing profile (5) and a handle placed in a connector, wherein the connector is a detachable connection with an adjustable angle between the handle and the fixing profile, in which the working blade is placed, wherein the connector (4) is provided with a support (6), which is flat in the area of the connection with the flat fixing profile (5) of the blade (2), wherein the support (6) is connected with the fixing profile (5) of the blade (2), using connecting elements (8), wherein the connector (4) includes a socket (9.1) with an opening (10.1) for a further connecting element (11) of the connector (4) with the handle (3), while the handle (3) is provided at the end with a socket (9.2) cooperating with the socket (9.1) of the connector (4) via said further connecting element (11), wherein the sockets (9.1,9.2), are provided with complementary radial protrusions (12) on cooperating contact surfaces of those sockets (9.1,9.2), wherein the radial protrusions (12) have triangular cross-section at the contact surfaces of the sockets (9.1,9.2), **characterised in that** the support (6) includes stiffening elements provided as ribs (7) wherein the support (6) is provided with an aperture (13) for insertion of the flat fixing profile (5),
2. A putty knife according to Claim 1, **characterised in that** the flat fixing profile (5), the blade (2) and the connector (4) include at least two cooperating openings (14) each.

### Patentansprüche

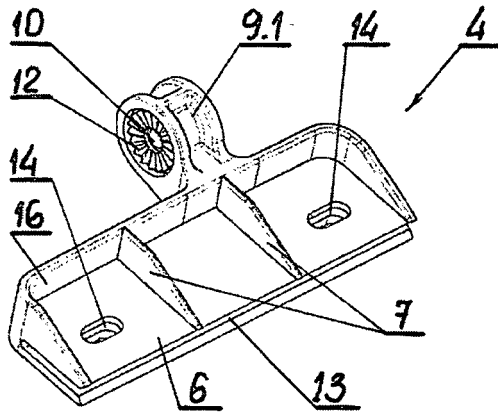
1. Kittmesser mit einer Metallklinge, einem flachen Befestigungsprofil und einem in einem Verbinder eingebetteten Schaft, wobei der Verbinder eine winkelverstellbare Trennverbindung zwischen dem Schaft und dem Befestigungsprofil ist, in dem die Arbeitsklinge eingebettet ist, **dadurch gekennzeichnet, dass** der Verbinder (4) eine Stütze (6) aufweist, die in der Verbindungszone mit dem flachen Befestigungsprofil (5) der Klinge (2) flach ist, wobei die Stütze (6) mittels Verbindungselementen (8) mit dem Befestigungsprofil (5) der Klinge (2) verbunden ist, wobei der Verbinder (4) eine Buchse (9.1) mit einem Loch (10.1) für ein zusätzliches Verbindungsele-

ment (11) des Verbinders (4) mit dem Schaft (3) aufweist, während der Schaft (3) an seinem Ende eine Buchse (9.2) aufweist, die mit der Buchse (9.1) des Verbinders (4) über das Verbindungselement (11) zusammenwirkt, wobei die Buchsen (9.1, 9.2) an den zusammenwirkenden Kontaktflächen dieser Buchsen (9.1, 9.2), wobei die radialen Vorsprünge (12) an den Kontaktflächen der Buchsen (9.1, 9.2) einen dreieckigen Querschnitt aufweisen, **dadurch gekennzeichnet, dass** die Stütze (6) Versteifungselemente in Form von Rippen (7) aufweist, wobei die Stütze (6) eine Spalte (13) zum Einsetzen des flachen Befestigungsprofils (5) aufweist.

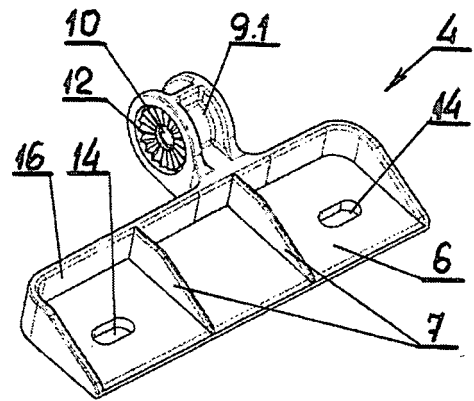
2. Kittmesser nach Anspruch. 1, **dadurch gekennzeichnet, dass** die Klinge (2) des flachen Befestigungsprofils (5) und der Verbinder (4) jeweils mindestens zwei zusammenwirkende Löcher (14) enthalten.

### Revendications

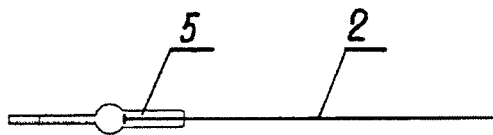
1. Un couteau à mastic avec une lame métallique, un profil plat de fixation et un manche placé dans un connecteur où le connecteur est une connexion détachable à angle réglable parmi le manche et le profil de fixation où la lame de travail est placée, **caractérisé en ce que** le connecteur (4) est équipé d'un support (6), qui est plat dans la zone de connexion au profil plat de fixation (5) de la lame (2), où le support (6) est connecté au profil de fixation (5) de la lame (2), par l'intermédiaire d'éléments de connexion (8), et le connecteur (4) comprend une douille (9.1) avec un trou (10.1) pour un élément de connexion complémentaire (11) du connecteur (4) avec le manche (3), et le manche (3) comprend à l'extrémité une douille (9.2) coopérant avec la douille (9.1) du connecteur (4) par l'intermédiaire d'un élément de connexion (11), et les douilles (9.1,9.2), sur les surfaces de contact de coopération de ces douilles (9.1,9.2) où des protrusions radiales (12) sur les surfaces de contact de ces douilles (9.1,9.2) ont une section triangulaire **caractérisé en ce que** le support (6) comprend d'éléments de raidissement sous forme de nervures (7) où le support (6) comprend une ouverture (13) pour insérer le profil plat de fixation (5).
2. Le couteau à mastic selon la revendication 1, **caractérisé en ce que** le profil plat de fixation (5) de la lame (2) et le connecteur (4) comprennent chacun au moins deux trous (14) coopérants.



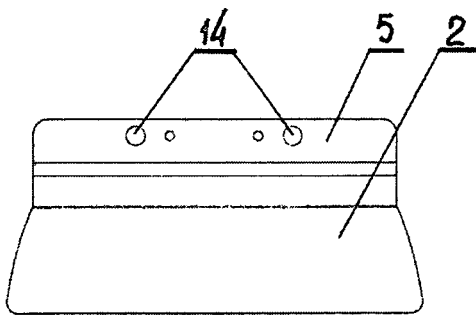
**Fig. 1**



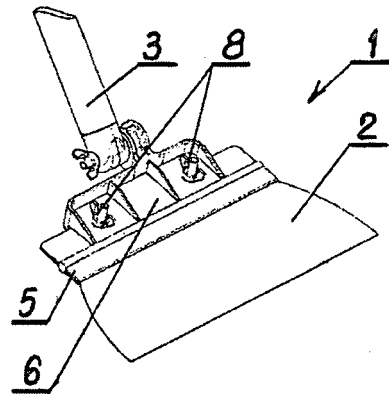
**Fig. 2**



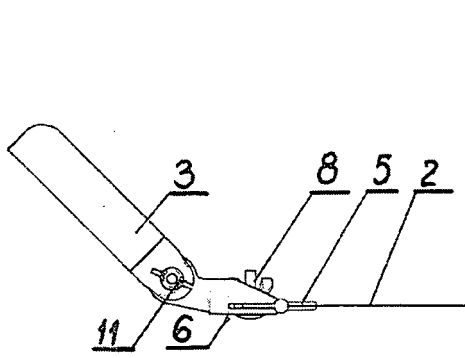
**Fig. 3**



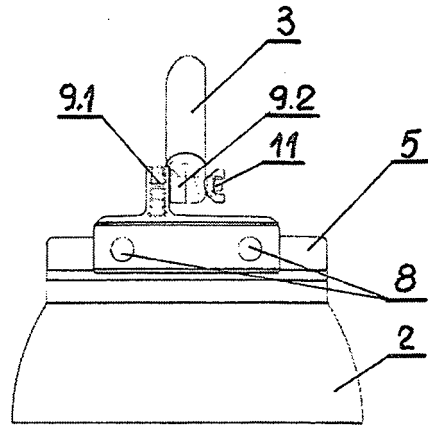
**Fig. 4**



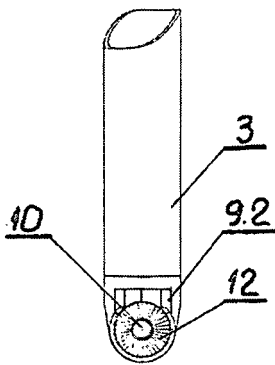
**Fig. 5**



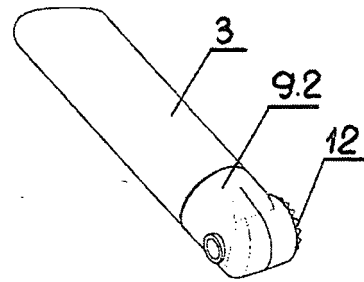
**Fig. 6**



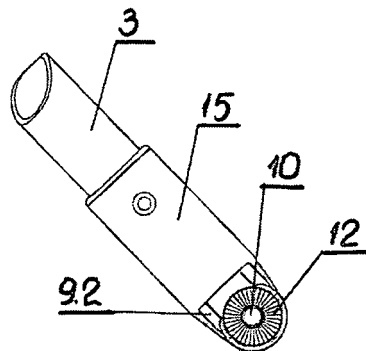
**Fig. 7**



**Fig. 8**



**Fig. 9**



**Fig. 10**

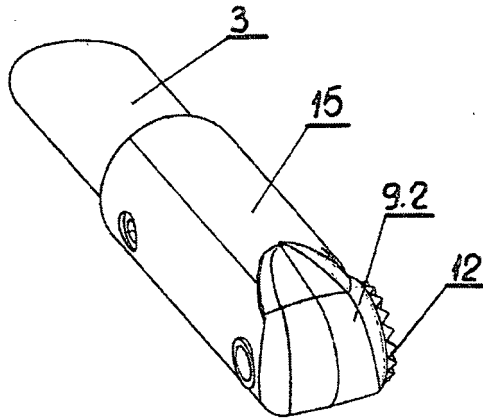


Fig. 11

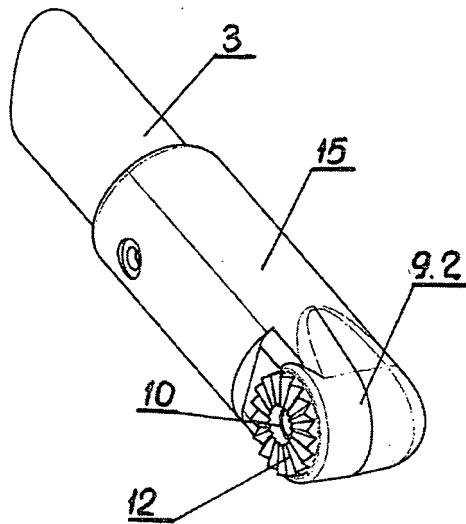


Fig. 12

**REFERENCES CITED IN THE DESCRIPTION**

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