

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 699 117 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

27.08.1997 Bulletin 1997/35

(21) Application number: **95907162.2**

(22) Date of filing: **08.12.1994**

(51) Int. Cl.⁶: **B25B 7/00**, B25G 1/10

(86) International application number:
PCT/SE94/01187

(87) International publication number:
WO 95/24993 (21.09.1995 Gazette 1995/40)

(54) **PRECISION PLIERS**

PRÄZISIONSZANGEN

TENAILLES DE PRECISION

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB IE IT LI NL SE

(30) Priority: **16.03.1994 SE 9400878**

(43) Date of publication of application:
06.03.1996 Bulletin 1996/10

(73) Proprietor: **SANDVIK AKTIEBOLAG**
811 81 Sandviken (SE)

(72) Inventors:
• **JANSSON, Conny**
S-745 71 Enköping (SE)

- **HIMBERT, Hans**
S-161 53 Bromma (SE)
- **BERGQVIST, Hakan**
S-161 53 Bromma (SE)
- **BOBJER, Olle**
S-163 58 Spanga (SE)

(74) Representative: **Taquist, Lennart et al**
Sandvik AB
Patents & Licences
Fack
811 81 Sandviken 1 (SE)

(56) References cited:
US-A- 4 829 858

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 699 117 B1

Description

Various types of pliers are used to hold and orient small items, especially during assembly and service of instruments, electronics and precision mechanics, also in surgery and cosmetic treatments.

For instance from US-A-4 829 858 a pliers according to the preamble of claim 1 is known, which is constructed with a view to the anatomy and anthropometry of the human hand for facilitating its manipulation.

The invention concerns a new configuration of the handles of the pliers to make it possible to handle and orient small items with higher precision than with previously known pliers.

This object is achieved by providing for a pliers as defined by claim 1.

Description

An embodiment of the invention is described with reference to the figures, where figure 1 shows a side view of a pliers according to the invention, and figure 2 shows in a front view how the pliers is held in the hand during high precision work.

A pliers according to the invention is shown in figure 1 and comprises two shanks hingedly connected at a joint (13). In front of the joint the shanks are shaped as jaws (11,12) and behind the hinge as handles with covers of soft polymer material. The jaws (11,12) may be different according to their use, round, flat, curved or sharp edged. The handles consist of two portions, a rear portion (16,17) to be gripped by the palm of the hand, and a front portion (14,15) to be gripped with the thumb and index fingers.

Within the rear portion (16,17) the handles are curved to have a convex outer contour, and to let the widest span for a closed pliers, measured on the outside of the handles, be close to the center of the rear portion, not at the rear end (20,21) of it.

The front portion (14,15) is so shaped that when the pliers is closed the outsides (18,19) of the handle covers together form at least half of a rotational surface, preferably cylindrical or conical, which can be gripped with the thumb and index finger as shown in figure 2. The span measured on the outsides shall be smaller in the front portion than in the rear portion. In a cross-section through the front portion the outsides (18,19) will each form a circular arc of at least 90 degrees, preferably 120 degrees, and when the pliers is closed by squeezing the handles, the arcs will have substantially the same center, making the span in this section substantially equal to the diameter of the arcs. The effect of this is that the pliers can be easily twirled between the thumb and the index finger to orient the shanks and any item held between the jaws in any desired angular position. The force between the thumb and the index finger will not cause any resulting torque on the pliers or the item.

A corresponding motion with a pliers according to

prior art where the handle covers do not form any cylindrical or conical front portion (14,15) will require either changing the grip of the palm, or performing the motion by rotating the whole hand, neither of which can be done with high precision. Compared to prior art, a pliers according to the invention will have handle covers with great lateral width, at least 70 % of the gripping span in the front portion when the pliers is closed.

A pliers according to the invention can be combined with return springs or locking means of known types.

Claims

1. Pliers comprising two shanks hingedly connected at a joint (13), with the shanks behind the joint shaped as handles with covers of polymeric material and in a rear portion having a convex outer contour, characterized by the outsides (18,19) of the handle covers in a front portion (14,15) forming part of a single surface of revolution about the longitudinal axis of the pliers when the pliers is closed by squeezing the handles.
2. Pliers according to claim 1, characterized by the surface of revolution being cylindrical or conical.
3. Pliers according to claim 1, characterized by the outsides (18,19) of the covers in a cross-section through the front portion being circular arcs, each at least 90 degrees.
4. Pliers according to claim 1, characterized by the lateral width of the handle covers in a front portion (14,15) being larger than 70 % of the span between the outside contours in the same portion when the shanks are squeezed together.

Patentansprüche

1. Zange mit zwei an einer Verbindungsstelle (13) schwenkbar verbundenen Schäften, wobei die Schäfte hinter der Verbindungsstelle als Handgriffe mit Überzügen aus Polymermaterial geformt sind und in einem hinteren Abschnitt einen konvexen Außenumriß haben, **dadurch gekennzeichnet**, daß die Außenseiten (18, 19) der Handgriffüberzüge in einem Vorderabschnitt (14, 15) Teil einer einzigen Rotationsoberfläche um die Längsachse der Zange bilden, wenn die Zange durch Zusammenpressen der Handgriffe geschlossen ist.
2. Zange nach Anspruch 1, **dadurch gekennzeichnet**, daß die Rotationsoberfläche zylindrisch oder konisch ist.
3. Zange nach Anspruch 1, **dadurch gekennzeichnet**, daß die Außenseiten (18, 19) der Überzüge in einem Querschnitt durch den Vorderabschnitt Kreisbögen jeweils von wenigstens 90° sind.

4. Zange nach Anspruch 1, **dadurch gekennzeichnet**, daß die seitliche Breite der Handgriffüberzüge in einem Vorderabschnitt (14, 15) größer als 70 % der Spanne zwischen den Außenumrissen in dem gleichen Bereich sind, wenn die Zange zusammengepreßt ist. 5

Revendications

1. Pince comprenant deux tiges reliées à un joint (13) 10
par l'entremise d'une charnière, où les tiges derrière le joint ont la forme de poignées couvertes d'un matériau en polymère, et où la partie arrière présente un contour externe convexe, caractérisée en ce que les parties externes (18, 19) des housses 15
de poignées sur la partie avant (14, 15) constituent une partie d'une surface de révolution unique autour de l'axe longitudinal des pinces, quand on ferme les pinces en serrant les poignées. 20
2. Pince selon la revendication 1, caractérisée en ce que la surface de révolution est cylindrique ou conique.
3. Pince selon la revendication 1, caractérisée en ce 25
que les parties externes (18, 19) des housses, en coupe à travers la partie avant, sont des arcs circulaires, faisant chacun au moins 90°.
4. Pince selon la revendication 1, caractérisée en ce 30
que la largeur latérale des housses de poignées sur la partie avant (14, 15) est supérieure à 70 % de l'écart entre les contours externes dans cette partie quand les tiges sont serrées l'une contre l'autre. 35

40

45

50

55

Fig. 1

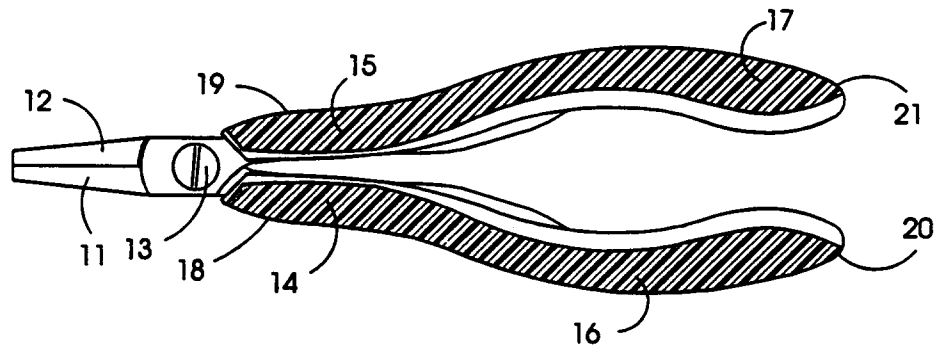


Fig. 2

