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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) MULTITOOL AND USE THEREOF

(57) Problem

The technical problem is to seek an alternative to a known multitool which provides the same or similar effects or is more cost-effective.

Solution

The problem is solved by a screwdriver shaft (11) and pliers (12) grooved complementary to the shaft (11) such that the shaft (11) is receivable between the pliers (12).

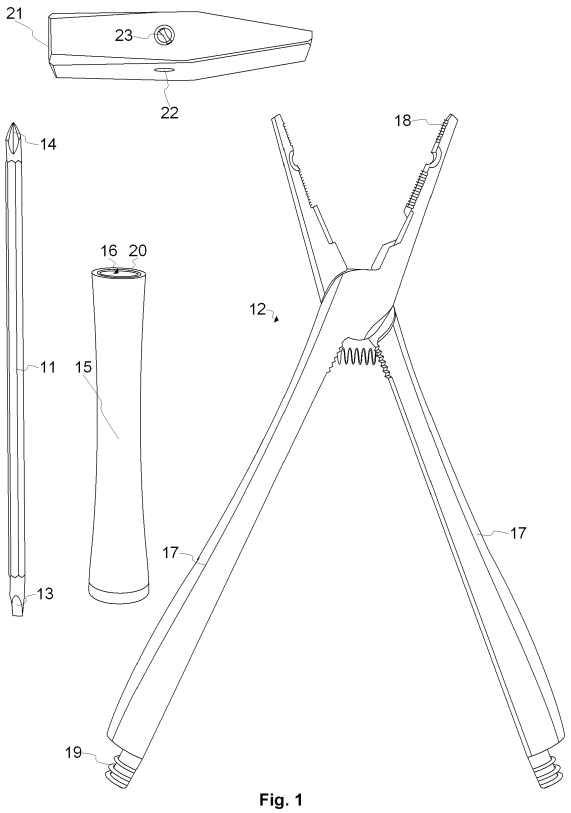

Fig. 1

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Description

Technical Field

[0001] The invention relates to a product and process as per the preamble of the independent claims.

Background Art

[0002] In technology, by tool is meant any physical item that can be used to achieve a goal, especially if the item is not consumed in the process. Particularly, a hand tool is any tool that is not a power tool - that is, one powered by hand (manual labour) rather than by an engine. More specifically, "multitool" or "multi-tool" refers to any one of a range of portable, versatile hand tools that combines several individual functions in a single unit.

[0003] US 4741059 A (PAN YAU ZUNG) 03.05.1988 discloses a combined tool unit constructed to be disassembled and reorganized into various independent tools. The tool unit includes a cylindrical hammer portion which can be received between a pair of hand grips of a tongs portion in the storage position of the tool unit. The hammer portion can be fixedly mounted on the closed jaws of the tongs portion to form an independent hammer. A saw blade can be removed from one of the hand grips of the tongs portion and locked into one end of the hammer portion to form an independent saw. A screwdriver bit can be removed from another end of the hammer portion and locked into the same end of the hammer portion where the saw blade can be locked, to form an independent screwdriver. The tongs when disassembled from the hammer portion can be used as a conventional pair of pincers. The hammer portion when disassembled from the tongs portion can be used as a knife by sliding a knife blade, which normally resides in a groove of the hammer portion, outwardly therefrom to thereby form an independent knife.

Summary of invention

[0004] The invention as claimed will hereinafter be disclosed in such a way that the technical problem with which it deals can be appreciated and the solution can be understood.

Technical Problem

[0005] The technical problem is to seek an alternative to the known product and process which provides the same or similar effects or is more cost-effective.

Solution to Problem

[0006] The problem is solved according to the characterizing portion of the independent claims.

Advantageous effect of invention

[0007] Like the known product, a preferred embodiment of the invention includes a screwdriver, pliers, and hammer. Of these hand tools, the screwdriver and hammer may be employed separately without having to reconfigure the multitool. Also, the screwdriver handle and hammerhead may be optimized independently in view of their respective purposes - such as by combining a heavy-duty claw hammer with a cabinetmaker's screwdriver possessing a light wooden or rubber handle for improved grip and comfort. This contrasts with the background art, where the hammerhead essentially doubles as a screwdriver handle.

[0008] With the pliers receiving the screwdriver shaft, the latter may remain protruding from the handle when the multitool is assembled for storage or transport, instantly ready for use once the screwdriver is detached from the pliers. As a constructive advantage vis-à-vis the established tool unit, the length of the shaft is by no means limited to the size of the handle or hammerhead, greatly increasing the resulting screwdriver's range of applications. Since the hammerhead may take the form of a massive body, it may be safely and easily attached to the pliers by means of an orthogonal setscrew rather than the multipiece arrangement known from the prior art, which incurs the risk of small parts getting lost. Thus secured, the multitool, even while fully assembled, may serve as a long-handled hammer.

[0009] Summarizing, the invention provides for a multitool that is ergonomic, sleek, and highly stable, all while retaining the functionality and performance of the individual tools it encompasses.

Brief description of drawings

[0010]

Figure 1 shows a screwdriver shaft, handle, hammerhead, and pliers.
Figure 2 shows the assembly of a screwdriver.
Figure 3 shows the assembly of a hammer.
Figure 4 shows the screwdriver and hammer, each assembled.
Figure 5 shows the fully assembled multitool.

Description of embodiments

[0011] Figure 1 illustrates the basic components of a multitool: a screwdriver shank or shaft (11), handle (15), hammerhead (21), and pliers (12). As may be gathered from the drawing, the shaft (11) has lengthwise opposing ends formed into a flat blade (13) and a double blade (14), respectively.

[0012] Figure 2 illustrates the assembly of a screwdriver. To this end, the handle (15) has a coaxial bore for receiving the shaft (11), the bore and shaft (11) having complementary hexagonal cross-sections. Depending

on the envisaged screw drive, the shaft (11) may thus be inserted coaxially into the bore in either orientation such that either the flat blade (13) or double blade (14) protrudes from the orifice (16 - Figure 1). When used in this depicted configuration, the shaft (11) and handle (15) will interlock against relative rotation such that the screwdriver may be employed without further fastening means.

[0013] As may also be taken from this drawing, the hammerhead (21) has an eye (22) for receiving the engaged jaws (18) of the pliers (12) such that the latter may serve as a helve or grip. To this end, the joined levers (17) that constitute the pliers (12) need simply be pivoted such that their jaws (18) mutually engage and can be inserted into the eye (22), resulting in the hammer of Figure 3. For locking the jaws (18) within that eye (22 - Figure 2), the hammerhead (21) further has a setscrew with a head (23) adapted to be driven, as depicted, by the flat blade (13) of the shaft (11). To allow it to sit flush with or below the surface of the hammerhead (21), said screw head (23) is countersunk into the hammerhead (21).

[0014] Figure 4 shows the resulting screwdriver and hammer, each assembled. As may be gathered from this drawing, the levers (17 - Figures 1 and 2) jointly bear an outer thread (19) across from their jaws (18) that, in the configuration depicted, mates with an inner thread (20) of the bore orifice (16 - Figure 1). To complete the assembly, the screwdriver may thus be attached to the hammer by screwing the handle (15) onto that outer thread (19), finally resulting in the multitool (10) of Figure 5. Here, the screwdriver shaft (11) is received between the pliers (12) which, to accommodate the shaft (11), are grooved complementary to it.

Industrial applicability

[0015] The invention may be applied, inter alia, throughout the tooling industry.

Reference signs list

[0016]

10	Multitool
11	Shaft
12	Pliers
13	Flat blade
14	Double blade
15	Handle
16	Orifice
17	Lever
18	Jaw
19	Outer thread
20	Inner thread
21	Hammerhead
22	Eye
23	Screw head

Citation list

[0017] Reference is made to the following document.

Patent literature

[0018] US 4741059 A (PAN YAU ZUNG) 03.05.1988

Claims

1. Multitool (10), comprising
a screwdriver shaft (11) and pliers (12),
characterized in that
the pliers (12) are grooved complementary to the shaft (11) such that the shaft (11) is receivable between the pliers (12).

2. Multitool (10) as per Claim 1, wherein
the shaft (11) has lengthwise opposing ends formed into a flat blade (13) and a double blade (14), respectively.

3. Multitool (10) as per Claim 1 or Claim 2, comprising
a handle (15) having a coaxial bore for receiving the shaft (11).

4. Multitool (10) as per Claim 3, wherein
the pliers (12) are composed of two pivotally joined levers (17), each bearing a jaw (18) and an outer thread (19) across from the jaw (18),
the bore has an orifice (16) bearing an inner thread (20), and
the pliers (12) and handle (15) are configured such that the outer thread (19) mates with the inner thread (20) if the jaws (18) mutually engage.

5. Multitool (10) as per Claim 4, further comprising
a hammerhead (21) having an eye (22) for receiving the engaged jaws (18).

6. Multitool (10) as per Claim 5, wherein
the hammerhead (21) further has a setscrew for locking the jaws (18) within the eye (22).

7. Multitool (10) as per Claim 6, wherein
the setscrew has a screw head (23) adapted to be driven by the shaft (11).

8. Multitool (10) as per Claim 7, wherein
the screw head (23) is countersunk into the hammerhead (21).

9. Multitool (10) as per any of Claim 3 to Claim 8, wherein
the shaft (11) and the bore have complementary polygonal cross-sections.

10. Multitool (10) as per Claim 9, wherein
the cross-sections are hexagonal.

11. Use of the multitool (10) as per Claim 7 or Claim 8, comprising
assembling a screwdriver by inserting the shaft (11) coaxially into the bore.

12. Use as per Claim 11, further comprising
pivoting the levers (17) such that the jaws (18) mutually engage and inserting the jaws (18) into the eye (22).

13. Use as per Claim 12, further comprising,
upon inserting the jaws (18), assembling a hammer by tightening the setscrew.

14. Use as per Claim 13, wherein
the setscrew is tightened using the screwdriver.

15. Use as per Claim 13 or Claim 14, further comprising
attaching the screwdriver to the hammer by screwing the handle (15) onto the levers (17).

Amended claims in accordance with Rule 137(2) EPC.

1. Multitool (10), comprising
a screwdriver shaft (11) and pliers (12) and
a handle (15) having a coaxial bore for receiving the shaft (11),
wherein
the pliers (12) are grooved complementary to the shaft (11) such that the shaft (11) is receivable between the pliers (12) and composed of two pivotally joined levers (17), each bearing a jaw (18) and an outer thread (19) across from the jaw (18),
the bore has an orifice (16) bearing an inner thread (20), and
the pliers (12) and handle (15) are configured such that the outer thread (19) mates with the inner thread (20) if the jaws (18) mutually engage, **characterized in**
a hammerhead (21) having an eye (22) for receiving the engaged jaws (18).

2. Multitool (10) as per Claim 1, wherein
the hammerhead (21) further has a setscrew for locking the jaws (18) within the eye (22).

3. Multitool (10) as per Claim 2, wherein
the setscrew has a screw head (23) adapted to be driven by the shaft (11).

4. Multitool (10) as per Claim 3, wherein
the screw head (23) is countersunk into the hammerhead (21).

5. Multitool (10) as per any of Claim 1 to Claim 3, wherein
the shaft (11) and the bore have complementary polygonal cross-sections.

6. Multitool (10) as per Claim 5, wherein
the cross-sections are hexagonal.

7. Use of the multitool (10) as per Claim 3 or Claim 4, comprising
assembling a screwdriver by inserting the shaft (11) coaxially into the bore.

8. Use as per Claim 7, further comprising
pivoting the levers (17) such that the jaws (18) mutually engage and inserting the jaws (18) into the eye (22).

9. Use as per Claim 8, further comprising,
upon inserting the jaws (18), assembling a hammer by tightening the setscrew.

10. Use as per Claim 9, wherein
the setscrew is tightened using the screwdriver.

11. Use as per Claim 9 or Claim 10, further comprising
attaching the screwdriver to the hammer by screwing the handle (15) onto the levers (17).

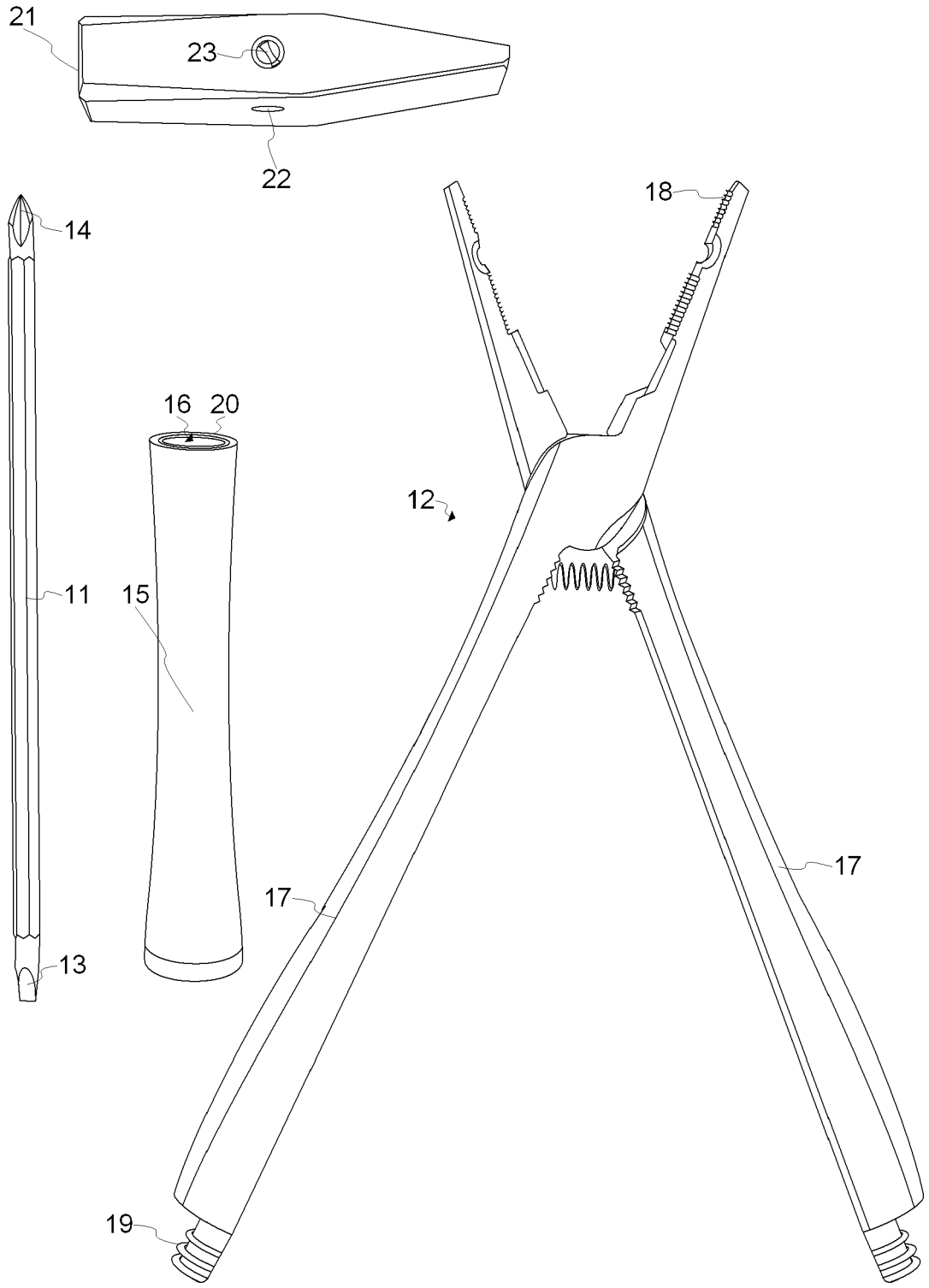

Fig. 1

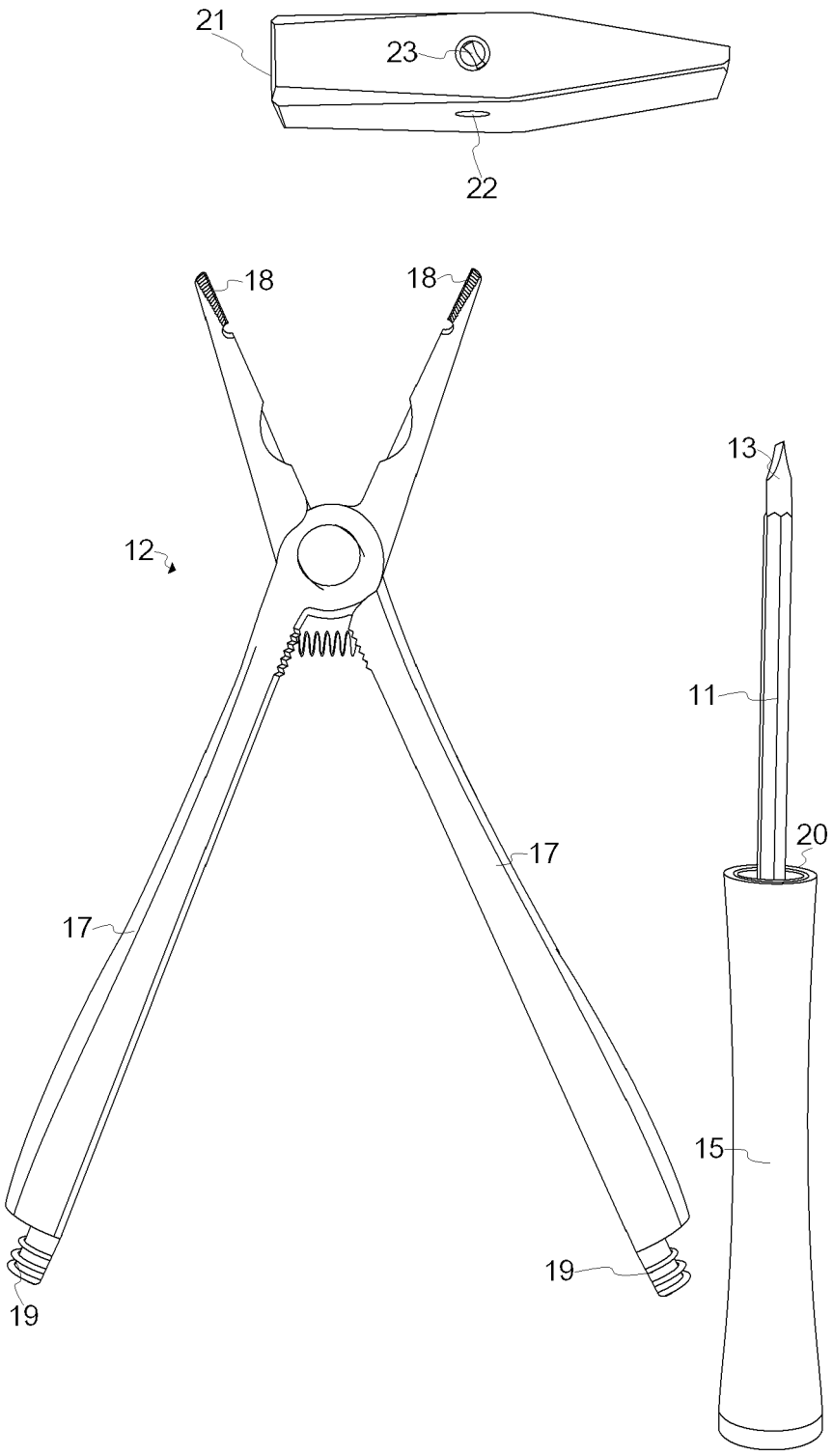

Fig. 2

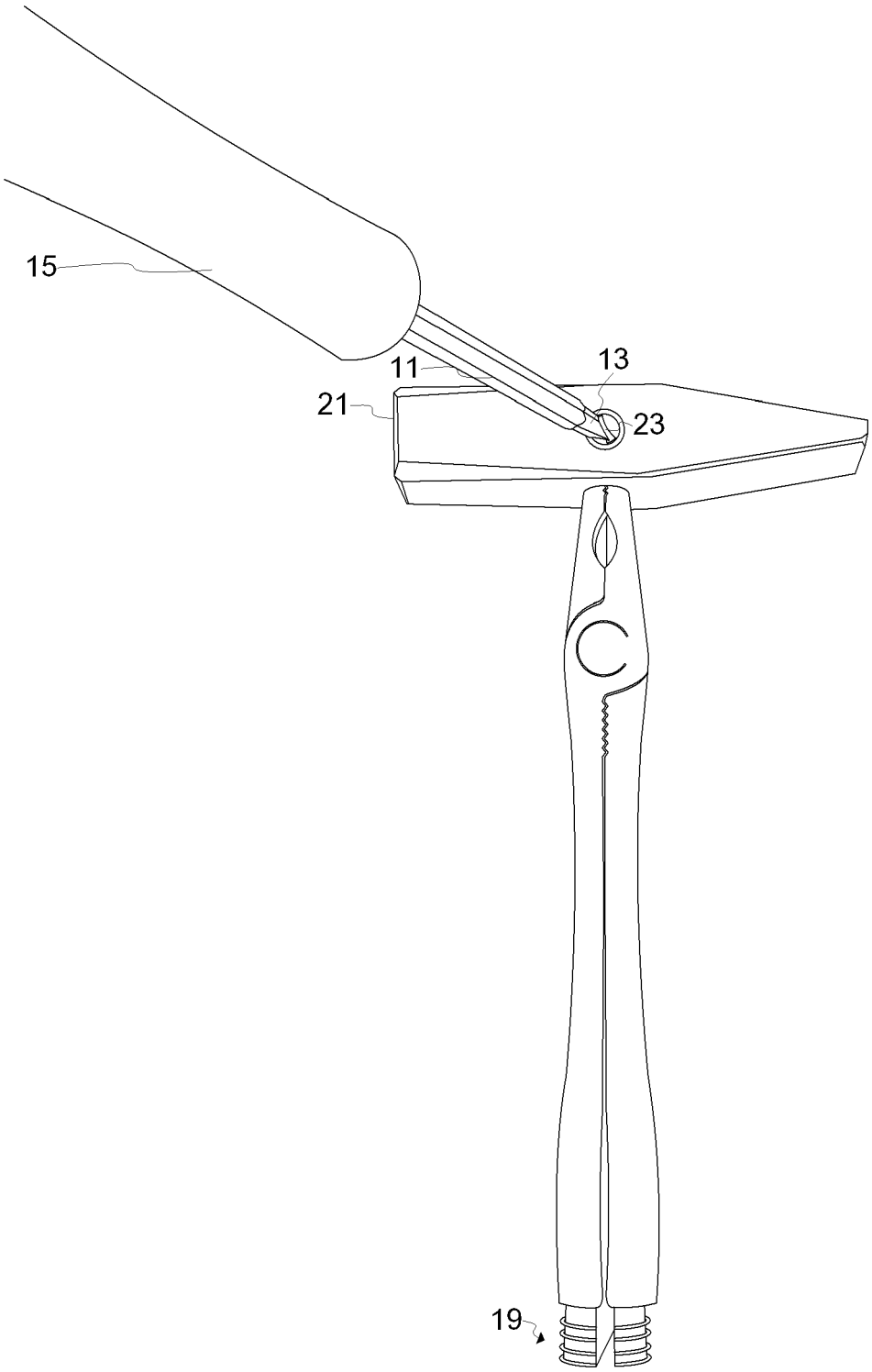

Fig. 3

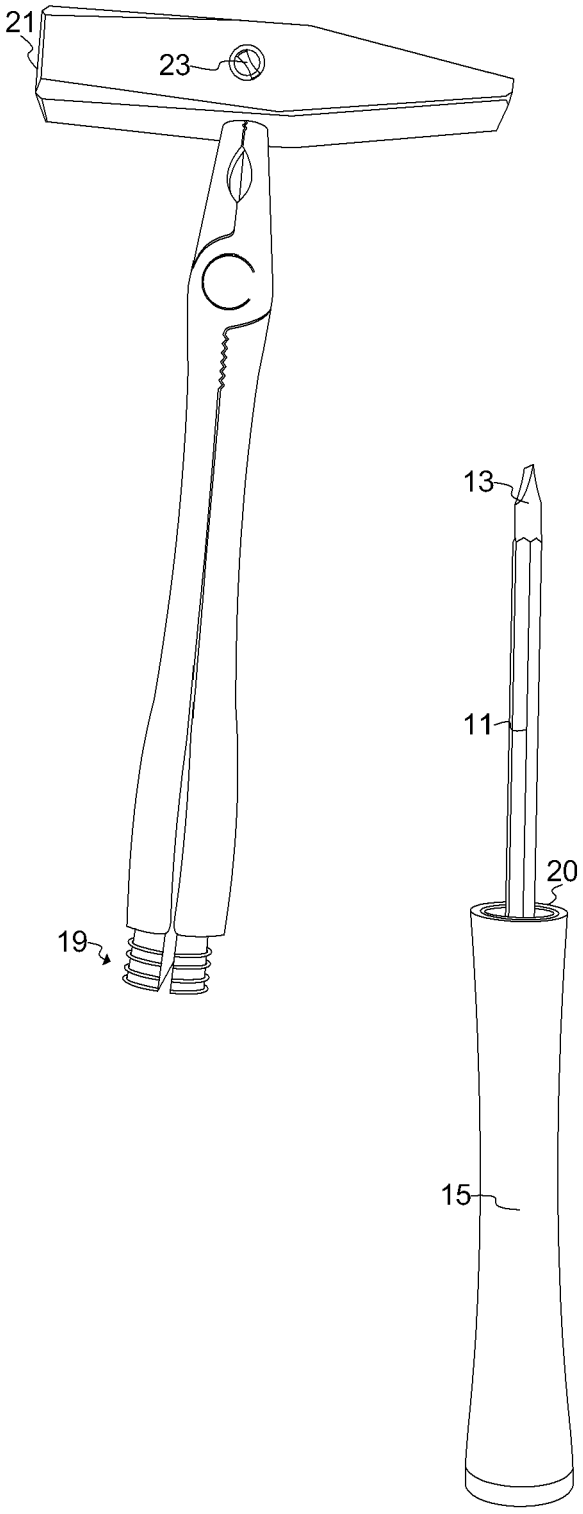

Fig. 4

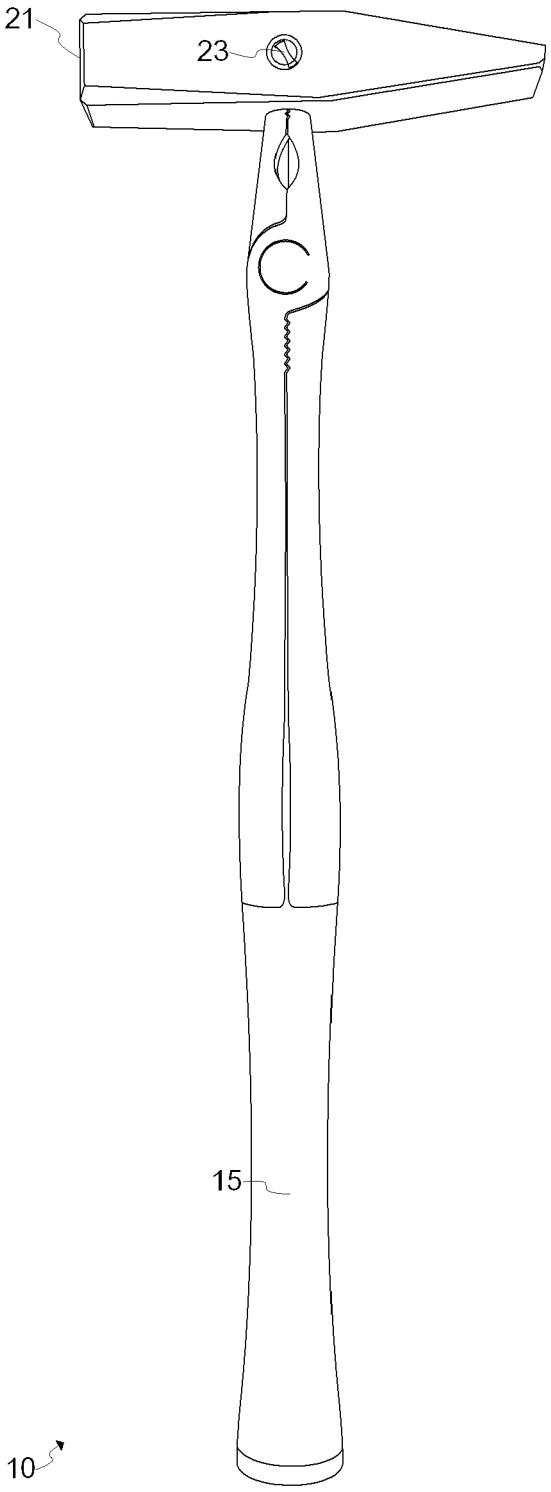

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 17 16 8901

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B25F
B25G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 November 2017	David, Radu

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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