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DESCRIPTION

Description

Field of the Invention

[0001] The invention relates to the field of manual tools, and in particular to a manual tool having a retractable tool member.

Description of the Prior art

[0002] Manual tools generally have a handle for hold and one or more tool members for specific purposes. It is desirable that the tool member, when not in use, can be retracted so as not to cause any inconvenience or injury to people. In the prior art, the tool member is often retracted in the handle in a retractable or foldable manner. To this end, it is generally required to simultaneously design a push button for deploying the tool member from the handle, a latch for locking the tool member in an operating state or a retracting state, and a guide rail, etc., thereby causing a complex structure, a high failure rate and production cost.

[0003] Moreover, it is also intended to provide more than one tool members on one manual tool to meet the needs of use in different situations, and further to hope that all these tool members can be retracted.

[0004] EP2511050A1 relates a hand operated crimping tool comprising a body arranged between a distal end and a proximal end of the crimping tool, a tool head arranged distally on the crimping tool, and handles arranged proximally on the crimping tool, where at least one handle is pivotally arranged, and where the relative movement of the tool handles is connected to the relative movement of crimping dies between which crimping dies at least one workpiece is arranged to be crimped, the tool head comprising a main head part and a pivotable head part, where the movement of the at least one pivotally arranged handle is further arranged connected to the movement of the pivotable head part via the body and a mechanism, whereby the pivotable head part of the tool head is arranged movable between an open head position and a closed head position depending on the relative position of the tool handles.

[0005] US2010/005640A1 relates a tool for removing a scrivet having a central shank and a compression sleeve having circumferentially spaced-apart wing elements is provided. The tool includes a first handle and a second handle, a first pair of gripping members configured to grip about the central shank of the scrivet, a second pair of gripping members configured to grip

about the base of the scrivet, a first connecting mechanism attached to the first pair of gripping members, and a second connecting mechanism attached to the second pair of gripping members. The tool is configured such that the first pair of gripping members engages the central shank upon a first predetermined amount of movement of the handles and pull the central shank at a second predetermined amount of movement of the handles. A third predetermined movement of the handles causes the second pair of gripping members to grip the base of the scrivet.

[0006] US4028971A relates a pair of pliers comprising a jaw assembly that is rotatable relative to a handle assembly preferably through a full 360 DEG angle thereby permitting use of the pliers with the jaw assembly in a plane that is independent of the plane of the handle assembly. The jaw assembly comprises a pair of pivotally interconnected jaws each having operating ends and a jaw centering mechanism. The handle assembly comprises a pair of handles fixed to a conic member and a linkage mechanism including a collar. The jaw assembly and the handle assembly are intercoupled by an operating shaft that passes in sequence through the collar and an aperture in the conic member to the jaw assembly whereby upon closing the handles the collar moves the shaft longitudinally thereby passing the operating ends into the conic member causing the jaw assembly to close. The conic member and other components interacting therewith permit relative rotation between the handle assembly and jaw assembly whether the pliers are open, closed or partially closed. US6185771B1 relates primarily to a versatile hand-held pocket tool having slidable pivoted jaws that are extensible from within the handle grips. The pivoted jaws are rotatably locked in the extended position thereby preventing the pliers from retracting when being used. When not in use the pliers are retracted into each of the handle grips and rotatably locked, maintaining the jaws in their storage position. Each of the jaws has two cutting surfaces; one notched cutting surface for cutting wire and one shearing surface for wire stripping and the like. Two foldable pivoted screwdrivers comprising a flattened blade type and a Phillips end type are included to provide versatile portable tool operation. The pocket tool can be manufactured using powdered metal technology to reduce the manufacturing cost and to ensure greater uniformity and precision.

[0007] Therefore, those skilled in the art are devoted to developing a manual tool with a simpler and more reliable structure having a tool member that can be retracted, and such a manual tool whose tool member comprises more than one tool portions.

Summary of the Invention

[0008] In view of the above-mentioned drawbacks of the prior art, the technical problem to be solved by the present invention is to provide a manual tool with a simpler and more reliable structure having a tool member that can be retracted, and such a manual tool whose tool member comprises more than one tool portions.

[0009] One aspect of the present invention firstly provides a manual tool having a retractable tool member according to Claim 1.

[0010] In a preferred implementation mode of the present invention, when the tool member is in the operating state, the tool member is deployed beyond the first proximal end and second proximal end, and when the tool member is in the retracting state, the tool member is retracted to a position between the first proximal end and the second proximal end and between the first distal end and the second distal end.

[0011] In another preferred implementation mode of the present invention, the first handle portion and the second handle portion are provided with a linkage mechanism at the first proximal end and the second proximal end. In a further embodiment, the linkage mechanism includes mutually matched circular-arc concave-convex grooves or splines. In another embodiment, the first handle portion comprises a first component and a second component, and the second handle portion comprises a third component and a fourth component, wherein the first component has a first extension portion that can match with the third component, the fourth component has a second extension portion that can match with the second component, the first component and the third component are pivotally connected to the first pivot at the first extension portion, and the second component and the fourth component are pivotally connected to the second pivot at the second extension portion, so as to constitute the linkage mechanism and the connector.

[0012] In another preferred implementation mode of the present invention, axes of the third pivot and the fourth pivot are coincident.

[0013] In another preferred implementation mode of the present invention, the fifth pivot is located at the first proximal end adjacent to the first handle portion, and the sixth pivot is located at the second proximal end adjacent to the second handle portion.

[0014] In another preferred implementation mode of the present invention, the tool member is configured with a critical point when moving between the operating state and the retracting state, and when the tool member is at the critical point, the third pivot, the fourth pivot, the fifth pivot, and the sixth pivot are laterally aligned on the same straight line.

[0015] In another preferred implementation mode of the present invention, the tool member is a pliers head, which comprises a first plier body and a second plier body, wherein the third pivot is located at a tail portion of the first plier body, and the fourth pivot is located at a tail portion of the second plier body.

[0016] In another preferred implementation mode of the present invention, an abutment portion is provided at the first tool end of the first linkage member and the second tool end of the second linkage member, a groove is provided at the tail portion of the first plier body and the tail portion of the second plier body, and when the pliers head is in the operating state, the abutment portion and the groove abut against each other.

[0017] In another preferred implementation mode of the present invention, the manual tool

further comprises a third linkage member that is equivalent to the first linkage member and a fourth linkage member that is equivalent to the second linkage member, wherein the first linkage member is integrated with the third linkage member, and the second linkage member is integrated with the fourth linkage member.

[0018] Another aspect of the present invention further provides a manual tool having a retractable tool member according to Claim 8.

[0019] In another preferred implementation mode of the present invention, the first handle portion and the second handle portion are provided with a linkage mechanism at the first proximal end and the second proximal end. In a further embodiment, the linkage mechanism includes a mutually matched circular-arc concave-convex grooves or splines. In another embodiment, the first handle portion comprises a first component and a second component, and the second handle portion comprises a third component and a fourth component, wherein the first component has a first extension portion that can match with the third component, the fourth component has a second extension portion that can match with the second component, the first component and the third component are pivotally connected to the first pivot at the first extension portion, and the second component and the fourth component are pivotally connected to the second pivot at the second extension portion, so as to constitute the linkage mechanism and the connector.

[0020] In another preferred implementation mode of the present invention, the fifth pivot is located at the first proximal end adjacent to the first handle portion, and the fifth pivot is located at the second proximal end adjacent to the second handle portion.

[0021] In another preferred implementation mode of the present invention, the tool member is configured with a critical point when moving among the first operating state, the second operating state, the first retracting state, and the second retracting state, and when the tool member is at the critical point, the first pivot, the second pivot, the third pivot, the fourth pivot, and the fifth pivot are laterally aligned on the same straight line.

[0022] In another preferred implementation mode of the present invention, when the tool member is in the first operating state, the first tool head is deployed beyond the first proximal end and the second proximal end; when the tool member is in the first retracting state, the tool member is retracted to a position between the first proximal end and the second proximal end and between the first distal end and the second distal end, and the first tool head faces the first proximal end and the second proximal end; when the tool member is in the second operating state, the second tool head is deployed beyond the first proximal end and the second proximal end; when the tool member is in the second retracting state, the tool member is retracted to a position between the first proximal end and the second proximal end and between the first distal end and the second distal end, and the second tool head faces the first proximal end and the second proximal end.

[0023] In another preferred implementation mode of the present invention, the manual tool

further comprises a third linkage member that is equivalent to the first linkage member and a fourth linkage member that is equivalent to the second linkage member, wherein the first linkage member is integrated with the third linkage member, and the second linkage member is integrated with the fourth linkage member.

[0024] In another preferred implementation mode of the present invention, the first tool head and the second tool head are respectively a first pliers head and a second pliers head formed by alternatively hinging a first plier body and a second plier body at the third pivot.

[0025] In another preferred implementation mode of the present invention, the first plier body and the second plier body are provided, at the third pivot, with an elastic member that biases jaws of the first pliers head and the second pliers head in an opening direction.

[0026] In another preferred implementation mode of the present invention, the fourth pivot is a first pin and the fifth pivot is a second pin, wherein when the tool member is in the first operating state, the first pin and the second pin abut against both sides of the second pliers head, respectively, so that the jaw of the first pliers head opens and closes under the action of the elastic member and the pin; when the tool member is in the second operating state, the first pin and the second pin abut against both sides of the first pliers head, respectively, so that the jaw of the second pliers heads opens and closes under the action of the elastic member and the pin.

[0027] In another preferred implementation mode of the present invention, a groove is provided at positions where the first pliers head or the second pliers head abuts against the first pin and the second pin.

[0028] In another preferred implementation mode of the present invention, the handle is provided with an arc-shaped groove at the fourth pivot and the fifth pivot, wherein the fourth pivot and the fifth pivot are movable in the arc-shaped groove.

[0029] In another preferred implementation mode of the present invention, the first tool head is a first tool bit and the second tool head is a second tool bit.

[0030] In another preferred implementation mode of the present invention, the first tool head is a first screwdriver bit and the second tool head is a second screwdriver bit.

[0031] The concepts, specific structures, and technical effects of the present invention will be further described below with reference to the accompanying drawings to fully understand the object, features, and effects of the present invention.

Brief Description of the Drawings

[0032]

Figure 1 is a schematic view of a retractable pliers in an embodiment according to the present invention.

Figure 2 is a schematic view of a retractable pliers during retraction in an embodiment according to the present invention.

Figure 3 is a schematic view of a retractable pliers that is closed in an embodiment according to the present invention.

Figure 4 is a schematic view of a linkage mechanism in an embodiment according to the present invention.

Figure 5 is a schematic view of a linkage mechanism in an embodiment according to the present invention.

Figure 6 is a schematic view of an abutment portion and a groove in an embodiment according to the present invention.

Figures 7 and 9-14 are schematic views of a dual-head retractable pliers in an embodiment according to the present invention.

Figure 8 is an exploded view of a dual-head retractable pliers in an embodiment according to the present invention.

Figures 15 and 16 are schematic views of a relief groove in an embodiment according to the present invention.

Figure 17 is a schematic view of an arc-shaped groove in an embodiment according to the present invention.

Figures 18-20 are schematic views of an integrally formed linkage member in an embodiment according to the present invention.

Figure 21 is a schematic view of another form of pliers head in an embodiment according to the present invention.

Figures 22 and 23 are dual-head retractable cutters in an embodiment according to the present invention.

Figures 24-26 are schematic views of a dual-head retractable screwdriver bit and heads of the screwdriver bit in an embodiment according to the present invention.

Detailed Description of the Preferred Implementation modes

[0033] The present invention will be further illustrated below with reference to the

accompanying drawings and specific embodiments.

[0034] The present invention firstly provides a manual tool whose tool member can be retracted and deployed. Figures 1 and 2 show a retractable pliers according to the present invention, which comprises a retractable pliers head 5, a handle and a linkage member. The handle comprises a handle portion 1 and a handle portion 2, wherein the handle portion 1 has a proximal end 11 and a distal end 12, the handle portion 2 has a proximal end 21 and a distal end 22, the handle portion 1 is rotatable about a pivot 111 located at the proximal end 11, and the handle 2 is rotatable about a pivot 211 located at the proximal end 21. The pivots 111 and 211 are connected by a connector 6. The linkage member comprises a linkage member 3 and a linkage member 4, wherein the linkage member 3 has a tool end 31 and a handle end 32, and the linkage member 4 has a tool end 41 and a handle end 42. The pliers head 5 is formed by alternatively hinging pliers bodies 51 and 52. The tool end 31 of the linkage member 3 is rotatably connected with a tail portion of the pliers body 52 through a pivot 311, and the handle end 21 of the linkage member 3 is rotatably connected with the handle portion 1 through a pivot 321. The tool end 41 of the linkage member 4 is rotatably connected with a tail portion of the pliers body 51 through a pivot 411, and the handle end 41 of the linkage member 4 is rotatably connected with the handle portion 2 through a pivot 421.

[0035] When the handle portions 1, 2 open or close, the pliers head 5 retractably moves relative to the handle under the driving of the linkage members 3, 4, so as to be configured in the operating state or the retracting state. When in the operating state, the pliers head 5 is deployed beyond the proximal ends 11, 21 of the handle; when in the retracting state, the pliers head 5 is retracted back into the handle, locating between the proximal ends 11, 21 and the distal ends 21, 22 of the handle.

[0036] The retractable pliers is also provided with a linkage mechanism at the proximal ends 11, 21 of the handle. In this embodiment, the linkage mechanism includes mutually matched splines 112, 212 as shown in Figure 2, so that when the handle portion 1 or 2 moves, the other handle portion 2 or 1 synchronously moves. In other embodiments, the linkage mechanism may also include mutually matched concave-convex grooves. In yet another embodiment, as shown in Figures 3, 4 and 5, the handle portion 1 comprises components 101, 102, and the handle 2 comprises components 201, 202, wherein the component 101 has an extension portion 1011 that matches with the component 201, and the component 202 has an extension portion 2021 that matches with the component 102. The component 101 and the component 201 are pivotally connected to the pivot 111 at the extension portion 1011, and the component 102 and the component 202 are pivotally connected to the pivot 211 at the extension portion 2021, thereby constituting the linkage mechanism and the connector.

[0037] As shown in Figure 6, the linkage members 3, 4 are provided with abutment portions 312, 412 at the tool ends 31, 41, respectively, and are provided with grooves 511, 521 at the tail portions of the pliers bodies 51, 52, respectively. When the pliers head 5 of the retractable pliers is in the operating state, the abutment portions 312, 412 respectively abut against the grooves 511, 521 to control the opening and closing of the pliers head 5.

[0038] The handle portions 1, 2, the linkage members 3, 4 and the pliers head 5 substantially constitute a planar link system so that the pliers head 5 can retractably move, through the linkage members 3, 4, with the opening and closing movements of the handle portions 1, 2. The link system has a critical point as shown in Figure 1. At this point, the pivots 311, 411, 321, and 421 are laterally aligned on the same straight line. The handle portions 1, 2 can be opened from the closed state to the state of the critical point. When the pliers head 5 moves toward the proximal ends 11, 21 of the handle to cross the critical point, closing the handles 1, 2 at this time will allow the pliers head 5 to continue extending and finally reach the operating state. When the pliers head 5 moves toward the proximal end 11, 21 of the handle to cross the critical point, closing the handles 1, 2 at this time will allow the pliers head 5 to continue extending and finally reach the operating state. Conversely, when the pliers head 5 moves toward the proximal ends 12, 22 of the handle to cross the critical point, closing the handles 1, 2 at this time will allow the pliers head 5 to retract and finally return to the retracting state.

[0039] In the present embodiment, the linkage members 3, 4 are located on one side of the pliers head 5. In another embodiment, the linkage members 3, 4 are located on both sides of the pliers head 5, respectively. In another embodiment, the linkage members 3A, 4A are located on one side of the pliers head 5, and the other side is provided with linkage members 3B, 4B that are equivalent to the linkage members 3A, 4A, respectively, as shown in Figure 8. Further, the linkage members 3A, 3B are integrally formed by, for example, a bending process for sheet metal, and the linkage members 4A, 4B are also integrally formed by, for example, a bending process for sheet metal, as shown in Figures 19 and 20.

[0040] In addition, in the present embodiment, the pivots 311 and 411 can also be coincident, i.e., they are actually the same pivot.

[0041] The present invention further provides such a manual tool that comprises more than one tool portions. See the embodiments shown in Figures 7 and 8. In the embodiment, the tool member 5 comprises a pliers head 5A and a pliers head 5B opposite to the pliers head 5A. In this embodiment, the pivot 311 and the pivot 411 are coincident, i.e., they actually become one pivot. The pliers head 5A and the pliers head 5B are formed by alternately hinging the pliers body 51 and the pliers body 52 at the pivot 311 (411). In the embodiment, under the driving of the handle and the linkage member, the tool member 5 has four states with respect to the handle: a first operating state in which the pliers head 5A is deployed beyond the proximal ends 11, 21, as shown in Figure 12; a second operating state in which the pliers head 5B is deployed beyond the proximal ends 11, 21, as shown in Figure 13; a first retracting state in which the pliers heads 5A, 5B are retracted to a position between the proximal ends 11, 21 and the distal ends 12, 22 of the handle, and the pliers head 5A faces the proximal ends 11, 21, as shown in Figure 10; and a second retracting state in which the pliers heads 5A, 5B are retracted to a position between the proximal ends 11, 21 and the distal ends 12, 22 of the handle, and the pliers head 5B faces the proximal ends 11, 21, as shown in Figure 14.

[0042] In this embodiment, in order to allow the tool member 5 to move relative to the handle

among these four states, the handle portions 1, 2, the linkage members 3, 4 and the pliers head 5 substantially constitute a planar link system, and the system has a critical point as shown in Figure 11. At this point, the pivots 311 (411), 111, 211, 321, and 421 are laterally aligned on the same straight line substantially. The handle portions 1, 2 can be opened from the first or second retracting state as shown in Figure 10 or 14 to the critical point as shown in Figure 11. Under the case, the following may occur: (1) if the tool member 5 moves toward the pliers head 5A to cross the critical point and the handles 1, 2 are closed toward the pliers heads 5B, then the tool member 5 will be placed in the first operating state as shown in Figure 12; (2) if the tool member 5 moves toward the pliers heads 5A to cross the critical point and the handle portions 1 and 2 are closed toward the pliers head 5A, then the tool member 5 will be placed in the second retracting state as shown in Figure 14; (3) if the tool member 5 moves toward the pliers head 5B to cross the critical point and the handle portions 1, 2 are closed toward the pliers head 5A, then the tool member 5 will be placed in the second operating state as shown in Figure 13; (4) if the tool member 5 moves toward the pliers head 5B to cross the critical point and the handle portions 1 and 2 are closed toward the pliers heads 5B, then the tool member 5 will be placed in the first retracting state as shown in Figure 12.

[0043] As shown in Figure 8, the pliers bodies 51, 52 are provided with a torsion spring 501 and a receiving groove 502 on the engaging surface at the pivot 311 (411) so that the jaws of the pliers heads 5A, 5B are subject to a biasing force in the opening direction. In the embodiment, the pivots 111, 211 are pins. As shown in Figure 16, when the pliers head 5A or 5B is in the operating state, the pins 111, 211 abut against both sides of the pliers head 5B or 5A, respectively, so that the jaws can be opened and closed under the action of the torsion spring 501. In a further embodiment, grooves 511, 512, 521, and 522 are provided at positions where the pliers head 5A or 5B abuts against the pins 111, 211, so that when the pliers head function is used, the opening angle of the handle is smaller, which facilitates hold and applying a force and provides a larger retracting area within the handle. In another further embodiment, instead of providing the grooves 511, 512, arc-shaped grooves 1110, 2110 are provided on positions where the handle matches with the pins 111, 211. The pins 111, 211 are movable in the arc-shaped grooves 1110, 2110, as shown in Figures 17 and 18, which can also achieve the effects of reducing the opening angle of the handle, facilitating hold and applying a force, and providing a larger retracting area within the handle when the pliers head function is used. In addition, when the widths of the functional parts of the two heads are not the same, the requirement that the opening angle of the handle changes a little when different functional parts are used can be substantially satisfied by providing the grooves or the arc-shaped grooves, thereby achieving a purpose that a user can feel comfortable and apply a force easily.

[0044] As shown in Figure 21, the tool member 5 can also be other type of dual-head pliers. As shown in Figure 22, the tool member 5 may also be a dual-head cutting tool.

[0045] As shown in Figures 23, 24, and 25, the tool member 5 may also be a dual-head screwdriver bit, and the heads of the screwdriver bit may also be one of various types of sleeves.

[0046] The handle portion can also be configured with other functional parts, just as a common multi-function pliers. Moreover, the functional parts can be used when the head is retracted in the handle, which is simple, quick, convenient and safe in operation.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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- [US4028971A \[0006\]](#)
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Krav

1. Et manuelt værktøj med en indtrækkelig værktøjsdel, som yderligere
5 omfatter et håndtag med en koblingsdel, hvor
- håndtaget omfatter et første håndtagsafsnit (1) og et andet håndtagsafsnit (2),
idet det første håndtagsafsnit (1) har en første proksimal ende (11) og en første distal
ende (12), idet det andet håndtagsafsnit (2) har en anden proksimal ende (21) og en
anden distal ende (22), idet det første håndtagsafsnit (1) kan dreje omkring en første
10 drejetap (111) placeret ved den første proksimale ende (11), idet det andet
håndtagsafsnit (2) kan dreje omkring en anden drejetap (211) placeret ved den anden
proksimale ende (21), og den første drejetap (111) og den anden drejetap (211) er
forbundet med hinanden via et samlestykke (6);
- koblingsdelen omfatter en første koblingsdel (3) og en anden koblingsdel (4),
15 idet den første koblingsdel (3) har en første værktøjsende (31) og en første
håndtagsende (32), og den anden koblingsdel (4) har en anden værktøjsende (41) og
en anden håndtagsende (42);
- værktøjsdelen (5, 5A, 5B) har en tredje drejetap (311) og en fjerde drejetap
(411), idet den første koblingsdel (3) er drejeligt forbundet med værktøjsdelen (5, 5A,
20 5B) via den tredje drejetap (311) ved den første værktøjsende (31), og den anden
koblingsdel (4) er drejeligt forbundet med værktøjsdelen (5, 5A, 5B) via den fjerde
drejetap (411) ved den anden værktøjsende (41);
- en femte drejetap (321) forefindes mellem den første proksimale ende (11) og
den første distale ende (12) af det første håndtagsafsnit (1), idet den første koblingsdel
25 (3), der er drejeligt forbundet med det første håndtagsafsnit (1) via den femte drejetap
(321) ved den første håndtagsende (32), og en sjette drejetap (421) forefindes mellem
den anden proksimale ende (21) og den anden distale ende (22) af det andet
håndtagsafsnit (2), idet den anden koblingsdel (4) er drejeligt forbundet med det andet
håndtagsafsnit (2) via den sjette drejetap (421) ved den anden håndtagsende (42); og
30 værktøjsdelen (5, 5A, 5B) er konfigureret til være indtrækkeligt i forhold til
håndtaget mellem en driftstilstand og en indtrækkende tilstand under betjeningen af
håndtaget og koblingsdelen;

kendetegnet ved, at: når værktøjsdelen (5, 5A, 5B) er i driftstilstand, er værktøjsdelen (5, 5A, 5B) udfoldet ud over den første proksimale ende (11) og den anden proksimale ende (21); og når værktøjsdelen (5, 5A, 5B) er i indtrækkende tilstand, er værktøjsdelen (5, 5A, 5B) trukket ind til en position mellem den første proksimale ende (11) og den anden proksimale ende (21) og mellem den første distale ende (12) og den anden distale ende (22); hvor det første håndtagsafsnit (1), det andet håndtagsafsnit (2), den første koblingsdel (3), den anden koblingsdel (4) og værktøjsdelen (5, 5A, 5B) udgør et plant koblingssystem, således at værktøjsdelen (5, 5A, 5B) bevæger sig indtrækkeligt gennem den første koblingsdel (3) og den anden koblingsdel (4) med åbnende og lukkende bevægelser af det første håndtagsafsnit (1) og det andet håndtagsafsnit (2).

2. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 1, hvor det første håndtagsafsnit (1) og det andet håndtagsafsnit (2) er udstyret med en koblingsmekanisme ved den første proksimale ende (11) og den anden proksimale ende (21).

3. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 2, hvor koblingsmekanismen omfatter gensidigt tilsvarende konkave–konvekse riller eller noter i cirkelbue (112, 212).

4. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 2, hvor det første håndtagsafsnit (1) omfatter en første komponent (101) og en anden komponent (102), og det andet håndtagsafsnit (2) omfatter en tredje komponent (201) og en fjerde komponent (202), idet den første komponent (101) har et første ekstensionsafsnit (1011), der kan passe sammen med den tredje komponent (201), og den fjerde komponent (202) har et andet ekstensionsafsnit (2021), der kan passe sammen med den anden komponent (102), idet den første komponent (101) og den tredje komponent (201) er drejeligt forbundet med den første drejetap (111) ved det første ekstensionsafsnit (1011), og den anden komponent (102) og den fjerde komponent (202) er drejeligt forbundet med den anden drejetap (211) ved det andet ekstensionsafsnit (2021), således at de udgør koblingsmekanismen og samlestykket (6).

5. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 1, hvor værktøjsdelen (5, 5A, 5B) er konfigureret med et kritisk punkt, når den bevæger sig mellem driftstilstanden og den indtrækkende tilstand; og når værktøjsdelen (5, 5A, 5B) er ved det kritiske punkt, er den tredje drejetap (311), den fjerde drejetap (411), den femte drejetap (321) og den sjette drejetap (421) lateralt opstillet på den samme lige linje overvejende.

6. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 1, hvor værktøjsdelen (5, 5A, 5B) er et tanghoved (5), idet tanghovedet (5) omfatter en første tangkrop (51) og en anden tangkrop (52), idet den tredje drejetap (311) er placeret ved et haleafsnit af den første tangkrop (51), og den fjerde drejetap (411) er placeret ved et haleafsnit af den anden tangkrop (52); et stødenafsnit (312, 412) forefindes ved den første værktøjsende (31) på den første koblingsdel (3) og den anden værktøjsende (41) på den anden koblingsdel (4); en rille (511, 512) forefindes ved haleafsnittet af den første tangkrop (51) og haleafsnittet af den anden tangkrop (52); og når tanghovedet (5) er i driftstilstand, støder stødenafsnit (312, 412) imod rillen (511, 512).

7. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 1, hvor det manuelle værktøj desuden omfatter en tredje koblingsdel (3B), der er ækvivalent med den første koblingsdel (3A) og en fjerde koblingsdel (4B), der er ækvivalent med den anden koblingsdel (4A), idet den første koblingsdel (3A) er integreret med den tredje koblingsdel (3B), og den anden koblingsdel (4A) er integreret med den fjerde koblingsdel (4B).

8. Et manuelt værktøj med en indtrækkelig værktøjsdel, der desuden omfatter et håndtag og en koblingsdel, hvor håndtaget omfatter et første håndtagsafsnit (1) og et andet håndtagsafsnit (2), idet det første håndtagsafsnit (1) har en første proksimal ende (11) og en første distal ende (12), idet det andet håndtagsafsnit (2) har en anden proksimal ende (21) og en anden distal ende (22), idet det første håndtagsafsnit (1) kan dreje omkring en første drejetap (111) placeret ved den første proksimale ende (11), idet det andet

håndtagsafsnit (2) kan dreje omkring en anden drejetap (211) placeret ved den anden proksimale ende (21), og den første drejetap (111) og den anden drejetap (211) er forbundet via et samlestykke (6);

5 koblingsdelen omfatter en første koblingsdel (3) og en anden koblingsdel (4), idet den første koblingsdel (3) har en første værktøjsende (31) og en første håndtagsende (32), og den anden koblingsdel (4) har en anden værktøjsende (41) og en anden håndtagsende (42);

10 værktøjsdelen (5, 5A, 5B) omfatter et første værktøjshoved og et andet værktøjshoved modsat det første værktøjshoved, og en tredje drejetap (311) forefindes på værktøjsdelen (5, 5A, 5B), idet den første koblingsdel (3) er drejeligt forbundet med værktøjsdelen (5, 5A, 5B) via den tredje drejetap (311) ved den første værktøjsende (31), og den anden koblingsdel (4) er drejeligt forbundet med værktøjsdelen (5, 5A, 5B) via den tredje drejetap (311) ved den anden værktøjsende (41);

15 en fjerde drejetap (411) forefindes mellem den første proksimale ende (11) og den første distale ende (12) af det første håndtagsafsnit (1), idet den første koblingsdel (3) er drejeligt forbundet med det første håndtagsafsnit (1) via den fjerde drejetap (411) ved den første håndtagsende, og en femte drejetap (321) forefindes mellem den anden proksimale ende (21) og den anden distale ende (22) af det andet håndtagsafsnit (2), idet den anden koblingsdel (4) er drejeligt forbundet med det andet håndtagsafsnit (2) via den femte drejetap (321) ved den anden håndtagsende (42); og

25 værktøjsdelen (5, 5A, 5B) er konfigureret til at være indtrækkelig i forhold til håndtaget i forbindelse med en første driftstilstand, en første indtrækkende tilstand, en anden driftstilstand, og en anden indtrækkende tilstand under betjeningen af håndtaget og koblingsdelen;

kendetegnet ved, at: når værktøjsdelen (5, 5A, 5B) er i driftstilstand, er værktøjsdelen (5, 5A, 5B) udfoldet ud over den første proksimale ende (11) og den anden proksimale ende (21); og når værktøjsdelen (5, 5A, 5B) er i indtrækkende tilstand, er værktøjsdelen (5, 5A, 5B) trukket ind til en position mellem den første proksimale ende (11) og den anden proksimale ende (21) og mellem den første distale ende (12) og den anden distale ende (22); hvor det første håndtagsafsnit (1), det andet håndtagsafsnit (2), den første koblingsdel (3), den anden koblingsdel (4) og værktøjsdelen (5, 5A, 5B) udgør et plant koblingssystem, således at værktøjsdelen (5,

5A, 5B) bevæger sig indtrækkeligt gennem den første koblingsdel (3) og den anden koblingsdel (4) med åbnende og lukkende bevægelser af det første håndtagsafsnit (1) og det andet håndtagsafsnit (2).

5 **9.** Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor det første håndtagsafsnit (1) og det andet håndtagsafsnit (2) er udstyret med en koblingsmekanisme ved den første proksimale ende (11) og den anden proksimale ende (21).

10 **10.** Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 9, hvor koblingsmekanismen omfatter gensidigt tilsvarende konkave–konvekse riller eller noter i cirkelbue (112, 212).

15 **11.** Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 9, hvor det første håndtagsafsnit (1) omfatter en første komponent (101) og en anden komponent (102), og det andet håndtagsafsnit (2) omfatter en tredje komponent (201) og en fjerde komponent (202), idet den første komponent (101) har et første ekstensionsafsnit (1011), der kan passe sammen med den tredje komponent (201), og den fjerde komponent (202) har et andet ekstensionsafsnit (2021), der kan passe
20 sammen med den anden komponent (102), idet den første komponent (101) og den tredje komponent (201) er drejeligt forbundet med den første drejetap (111) ved det første ekstensionsafsnit (1011), og den anden komponent (102) og den fjerde komponent (202) er drejeligt forbundet med den anden drejetap (211) ved det andet ekstensionsafsnit (2021), således at de udgør koblingsmekanismen og samlestykket.

25

12. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor værktøjsdelen (5, 5A, 5B) er konfigureret med et kritisk punkt, når den bevæger sig mellem den første driftstilstand, den anden driftstilstand, den første indtrækkende tilstand og den anden indtrækkende tilstand; og når værktøjsdelen (5, 5A, 5B) er ved
30 det kritiske punkt, er den første drejetap (111), den anden drejetap (211), den tredje drejetap (311), den fjerde drejetap (411) og den femte drejetap (321) lateralt opstillet på den samme lige linje overvejende.

13. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor, når værktøjsdelen (5, 5A, 5B) er i den første driftstilstand, det første værktøjshoved er udfoldet ud over den første proksimale ende (11) og den anden proksimale ende (21); når værktøjsdelen (5, 5A, 5B) er i den første indtrækkende tilstand, er værktøjsdelen

5 (5, 5A, 5B) trukket ind til en position mellem den første proksimale ende (11) og den anden proksimale ende (21) og mellem den første distale ende (12) og den anden distal ende (22), og det første værktøjshoved er vendt mod den første proksimale ende (11) og den anden proksimale ende (21); når værktøjsdelen (5, 5A, 5B) er i den anden driftstilstand, er det andet værktøjshoved udfoldet ud over den første proksimale ende

10 (11) og den anden proksimale ende (21); når værktøjsdelen (5, 5A, 5B) er i den anden indtrækkende tilstand, er værktøjsdelen (5, 5A, 5B) trukket ind til en position mellem den første proksimale ende (11) og den anden proksimale ende (21) og mellem den første distale ende (12) og den anden distale ende (22), og det andet værktøjshoved er vendt mod den første proksimale ende (11) og den anden proksimale ende (21).

15

14. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor det første værktøjshoved og det andet værktøjshoved er henholdsvis det første tanghoved (5A) og det andet tanghoved (5B) dannet ved alternativt at hængsle en første tangkrop og en anden tangkrop ved den tredje drejetap (311).

20

15. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor en rille (511, 512, 521, 522) forefindes ved positioner, hvor det første tanghoved (5A) eller det andet tanghoved (5B) støder imod den fjerde drejetap (111) og den femte drejetap (211).

25

16. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor håndtaget er udstyret med en bueformet rille (1110, 2110) ved den fjerde drejetap (111) og den femte drejetap (211), idet den fjerde drejetap (111) og den femte drejetap (211) er bevægelige i den bueformede rille (1110, 2110), således at en åbningsvinkel

30 for håndtaget er mere egnet til at holde det i en driftstilstand, og et tilpasningsmellemlum i håndtaget er bredere i den indtrækkende tilstand.

17. Det manuelle værktøj med en indtrækkelig værktøjsdel ifølge krav 8, hvor det første værktøjshoved er en første værktøjsbit eller en første skruetrækkerbit, og det andet værktøjshoved er en anden værktøjsbit eller en anden skruetrækkerbit.

DRAWINGS

Drawing

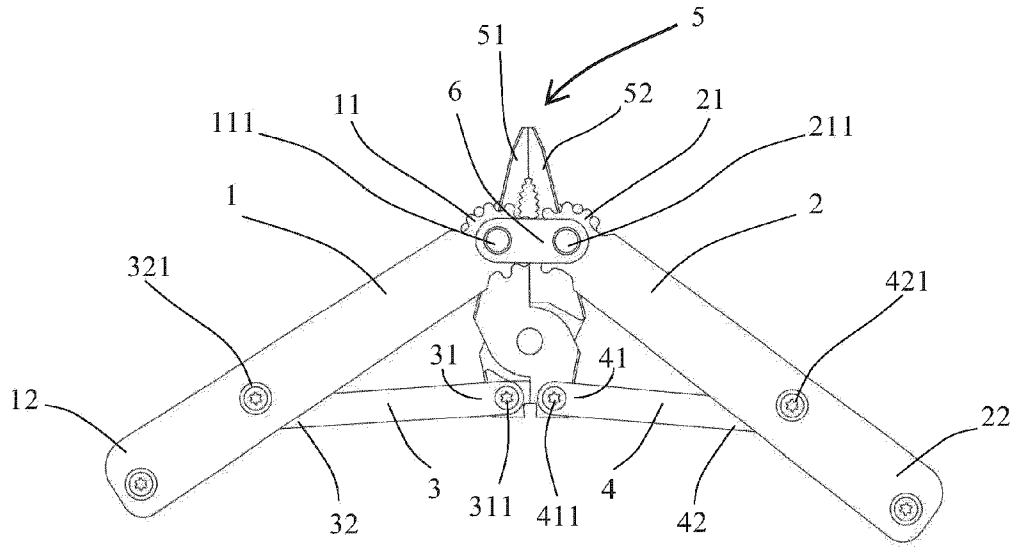


Fig.1

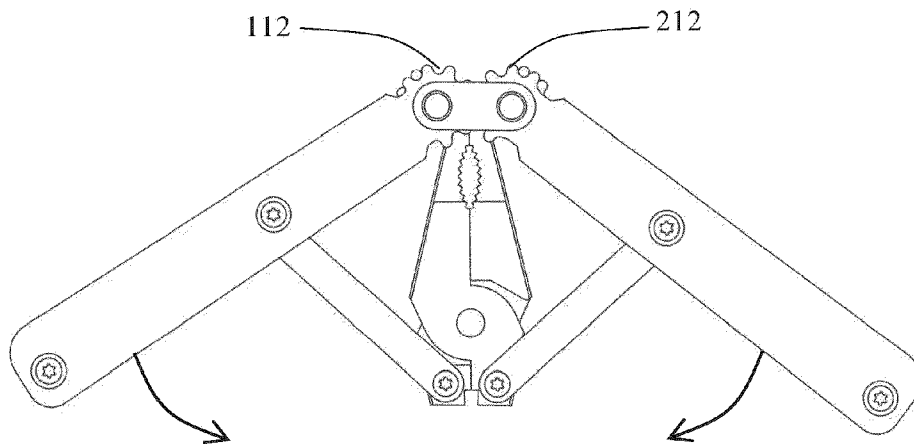


Fig.2

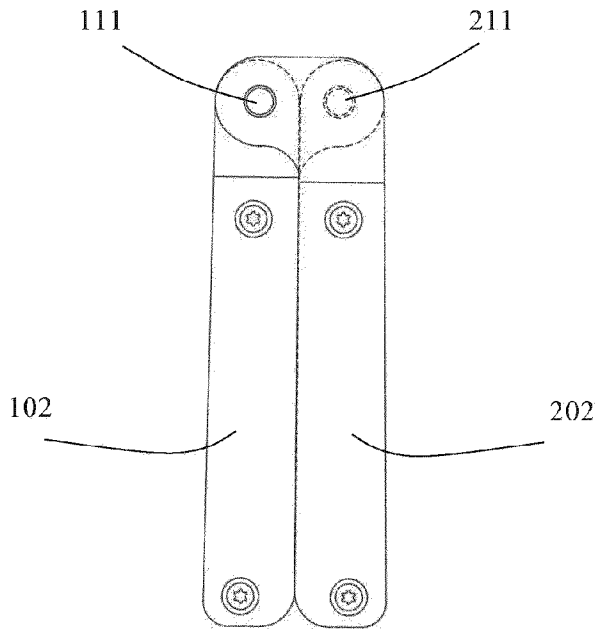


Fig.3

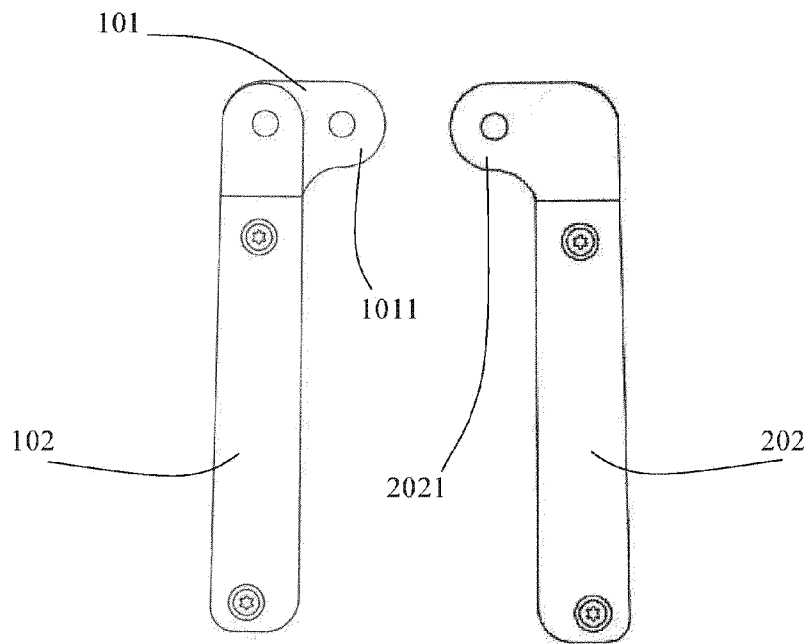


Fig.4

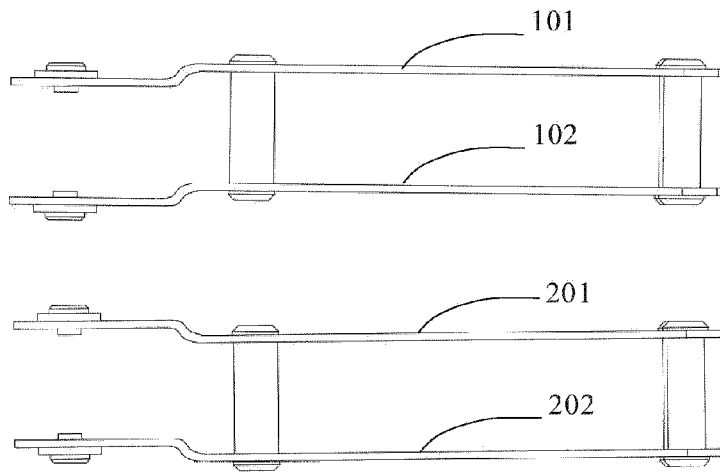


Fig.5

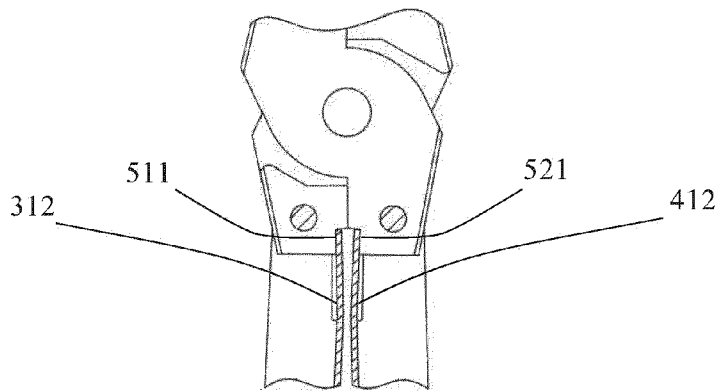


Fig.6

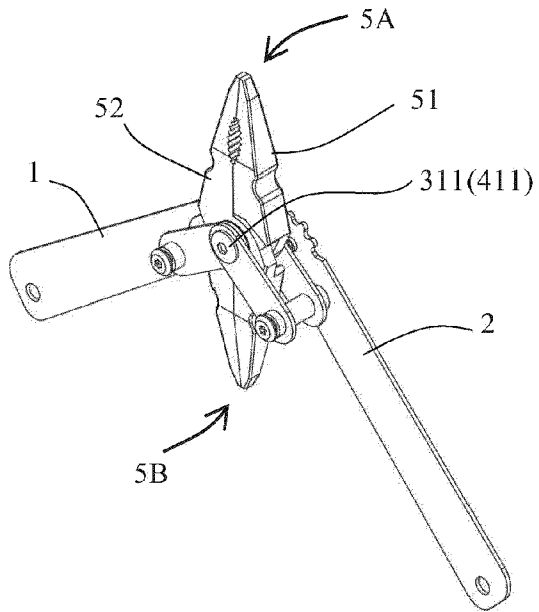


Fig.7

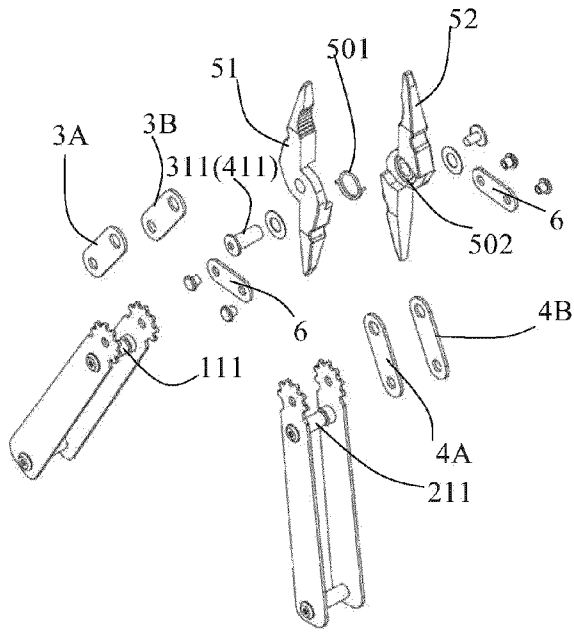


Fig.8

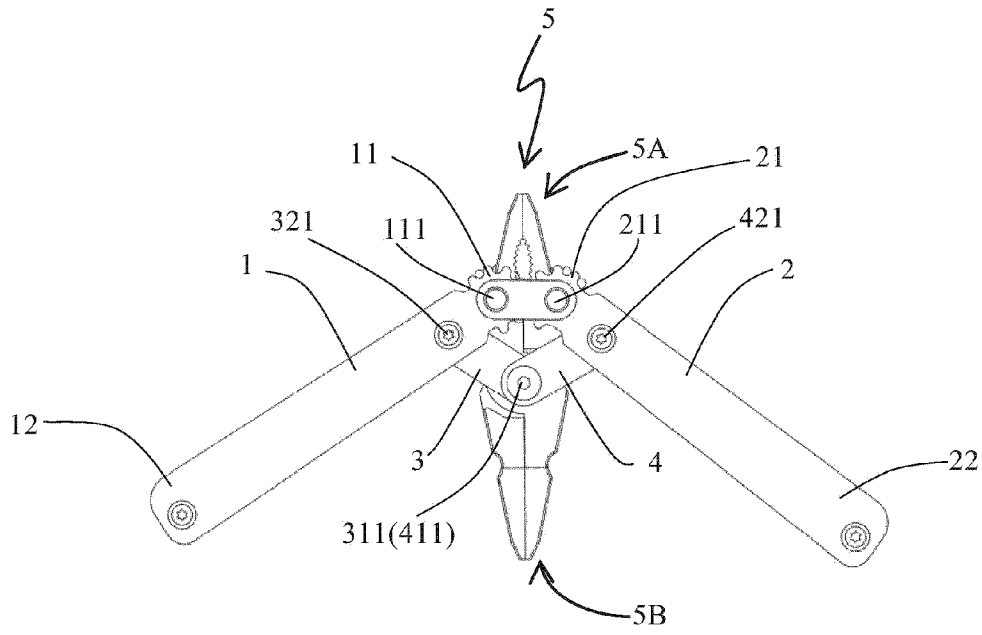


Fig.9

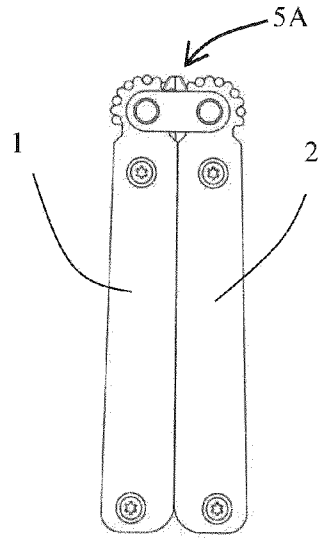


Fig.10

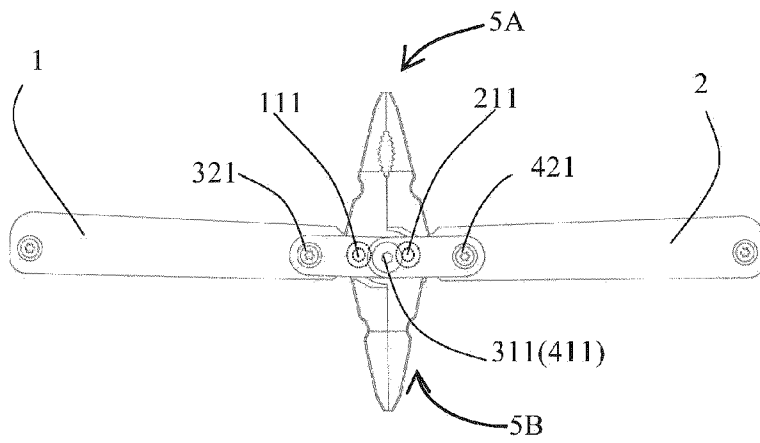


Fig.11

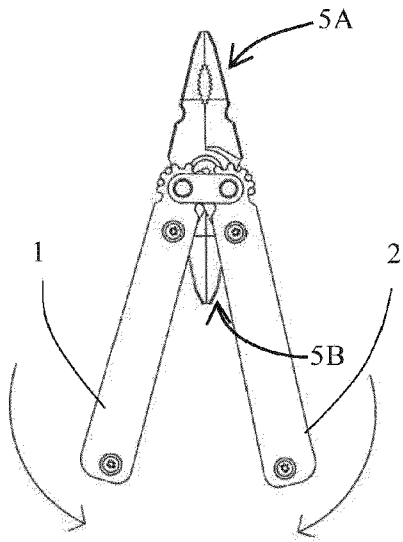


Fig.12

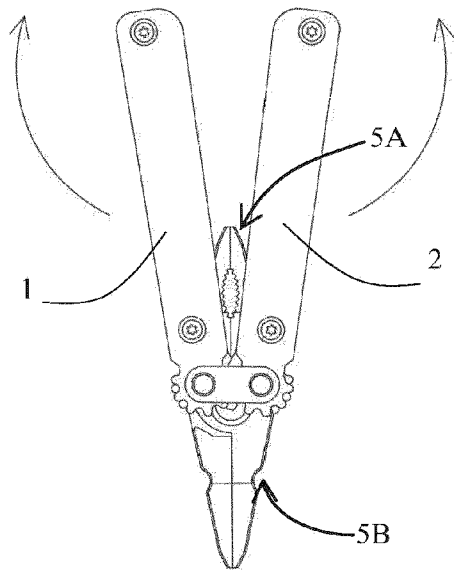


Fig.13

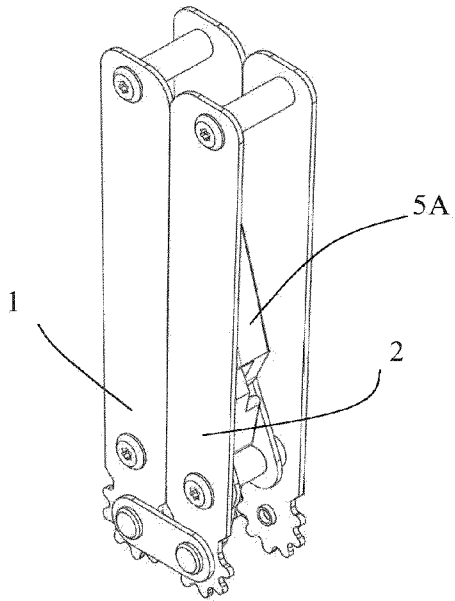


Fig.14

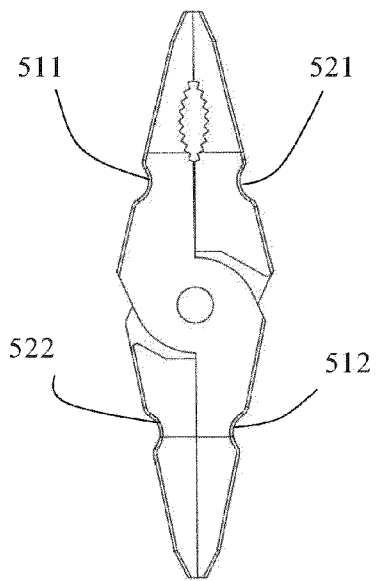


Fig.15

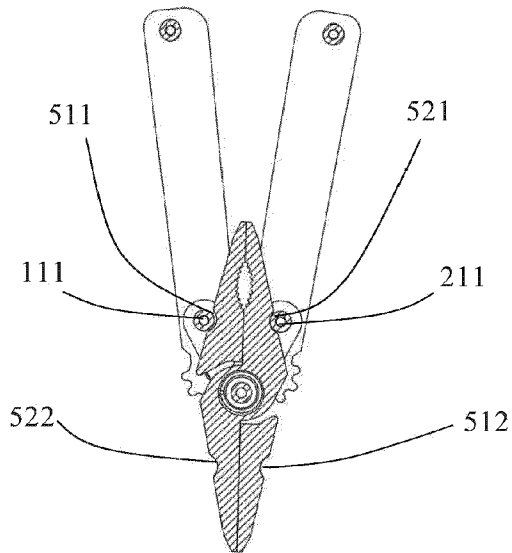


Fig.16

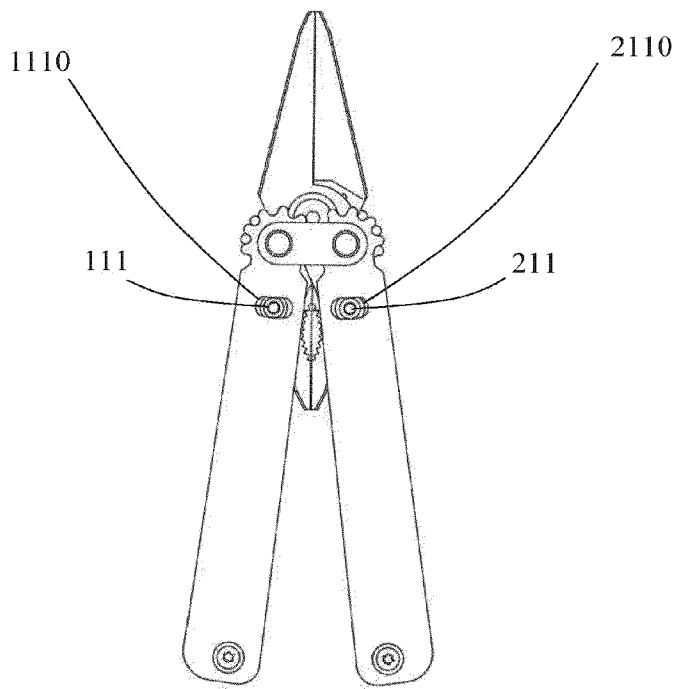


Fig.17

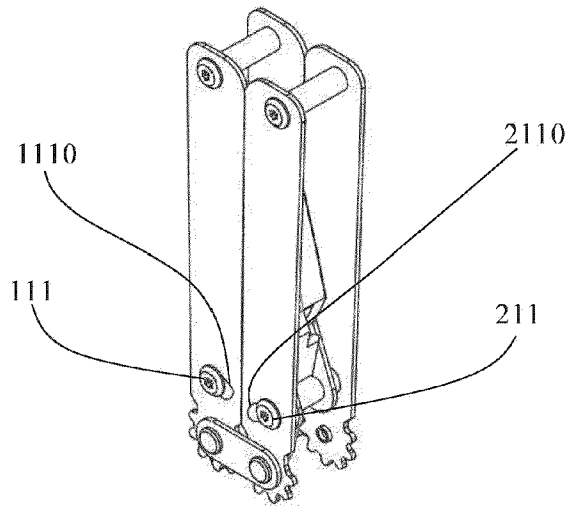


Fig.18

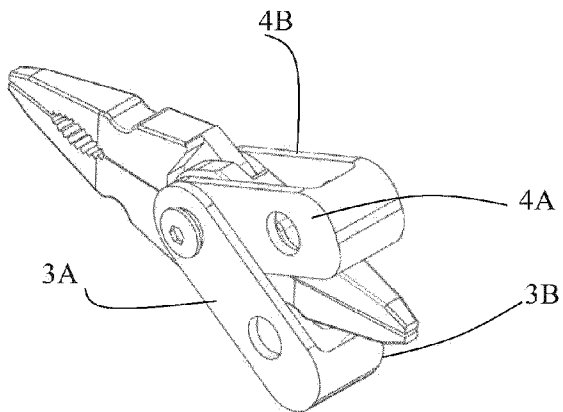


Fig.19

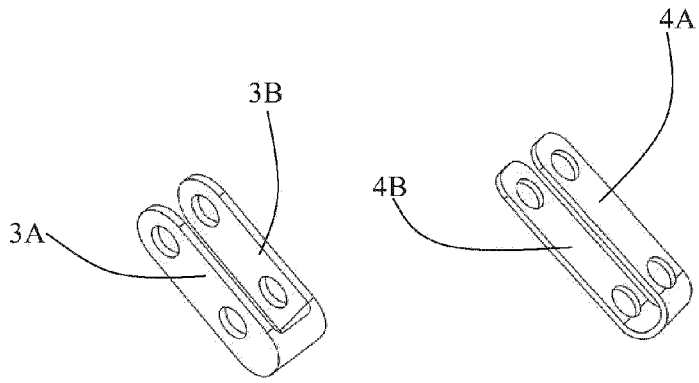


Fig.20

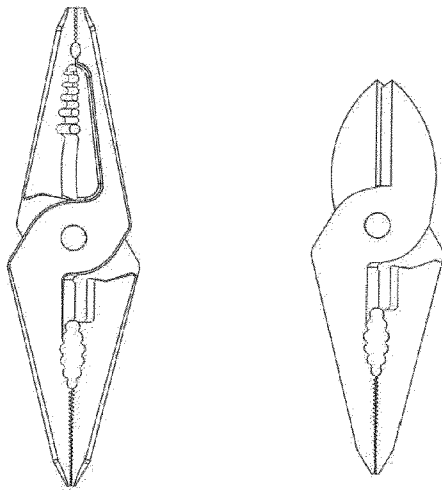


Fig.21

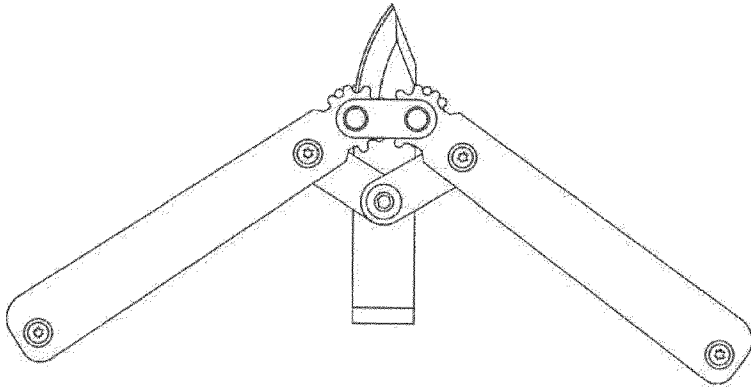


Fig.22

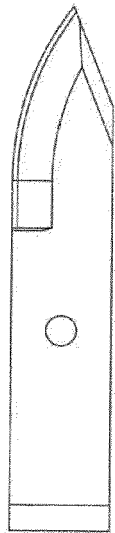


Fig.23

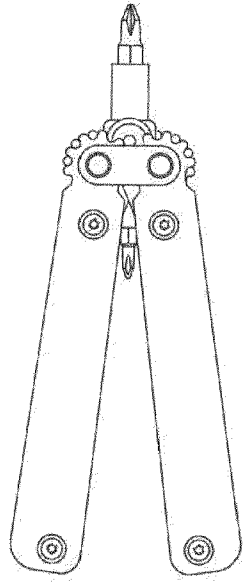


Fig.24

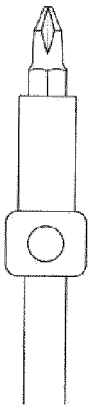


Fig.25

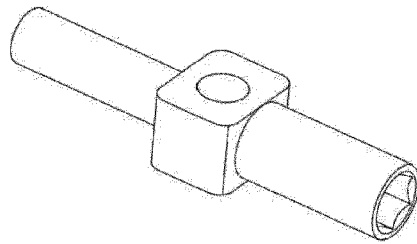


Fig.26