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(54) **Bit holder**

(57) The present invention provides a kind of bit holder comprising a shank (2), on which a combination part (20) was designed which can incorporate with a hand tool; additionally, a C-shaped retaining groove (21) was set particularly for a C-shaped buckle (210), and a reversion locking bulge (22) was designed particularly for pulling out a screw; in addition, some plural locking bead holes (24) and buckling bead holes (25) were designed for buckling round beads (240) and buckling beads (250) respectively; and concaved pentagonal cover was designed for working with the adjusting sleeve (6) with a certain locking depth; at last, a combination groove of bit was designed on the front of shank (2); a sleeve (4), on which a perforation (40) was designed for the said shank; and an inner ringy cover (41) was set, which can hold one end of spring (211) of the shank, among which some perforations were designed for assorting with the afore-said locking bulge (22); additionally, an outer threading (45) was designed for adjusting screw lock of sleeve; in addition, a position bead hole (44) was designed on the outer screw thread for a position bead (440); and an adjusting sleeve (6) was designed with an inner threading (61) for locking the outer threading of the said sleeve; additionally, a long concaved groove (610) was designed on the inner wall of adjusting sleeve. While using this long concaved groove to assort with the action of the said position bead, the locking position of adjusting sleeve (6) and the said sleeve (4) can be adjusted. Therefore, it can adjust the extension length of bit, work with locking depth of various screws and release timely locking twisting force of bit after the completion of screw's locking.

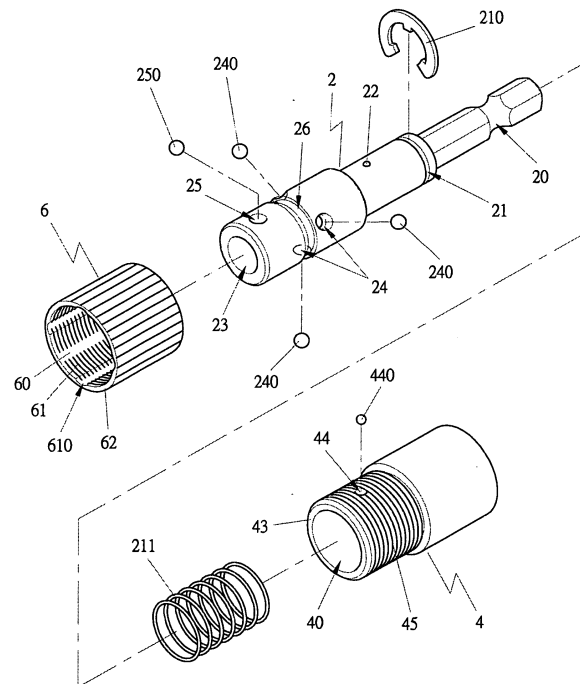


FIG 4

Description

FIELD OF THE PRESENT INVENTION

[0001] The present invention provides a kind of Bit Holder, which particularly can incorporate with a variety of locking depth of various screws and adjust the extension length of screwdriver freely and use the buckling bead designed on the shank to fix and replace the bit faster and more conveniently; additionally, it can release locking twisting force of bit after the completion of screw's locking. **BACKGROUND OF THE PRESENT INVENTION**

[0002] According to the popular bit holders (as shown in Figure 1-3), such as US patent No. 4287923 and 4753142, the prior invention includes: a shank 1, on which a combination part 10 that can incorporate with hand tools, was designed; and a C-shaped retaining groove 11 which would be buckled by C-shaped buckle 110, and a reversion locking bulge 12 was designed. If necessary, just press the internal and external sleeve 15, 16 backwards to make the bit keep its extended (see Figure 3), and the screw in some parts would be pulled out; additionally, a plural locking bead hole 13 was designed for buckling round bead 130, and a combination groove 14, in which a flexible retaining groove 140 which would be buckled by a flexible buckle 141, was designed, and the flexible buckle 141 would be buckled within concaved pentagonal cover 170 of the bit 17 and combine the bit 17 with shank 1; in addition, an external sleeve 15 was designed to have a perforation 150 through which the shank 1 and a spring 151 can go; and an internal sleeve 16, whose rear holds one end of the said spring 151, is equipped with a ring concaved groove 160, the ring concaved groove 160 can work with the action of the said buckling round bead 130 and release the twisting force of bit timely (see Figure 2).

[0003] However, because the extension length of bit cannot be adjusted as requested when lock screw is up to a certain depth as the state shown in Figure 1, the said invention cannot work with the locking requirement of various screws, for example, the pan screw's long head remained on the parts results in bad locking. Additionally, the bit 17 is fixed on the combination groove 14 of shank 1 with the flexible buckle 141 that can fix the bit well but is hard to replace, and generally, a pincers is required for clipping it, which brings inconvenience to the user. For this purpose, the present invention can overcome the prior ones' locking defects and bring convenience to the user so as to meet the important requirement of innovation.

SUMMARY OF THE PRESENT INVENTION

[0004] The purpose of the present invention is to provide a kind of Bit Holder, which can work with a variety of locking depth of various screws and adjust the extension length of the bit freely; and a buckling bead was

designed on the shank for fixing the bit and providing convenient replacement to user; additionally, it can release locking twisting force of bit after the completion of screw's locking timely. The present invention was designed to fix the bit with sleeve to limit and fix the buckling bead located on the combination groove.

[0005] The Bit Holder means that an outer threading was designed on the sleeve, locking the adjusting sleeve. And a position bead hole was designed for position bead. Adjust the operational state of the long concaved groove of the inner wall of position bead and adjusting sleeve to change the locking position of the adjusting sleeve and the said sleeve. It can change the extension length of the bit and work with a variety of locking depth of various screws and release timely locking twisting force of bit after the completion of screw's locking.

Methods of Application

[0006] Thus, for your deeper understanding of the present invention, some explanation on drawings is given as follows:

[0007] As shown in Figure 4-8, the present invention provides a kind of Bit Holder which contains:

a shank on which a combination part 20 was designed and the combination part 20 can incorporate with hand tools; additionally, a C-shaped retaining groove 21 was set particularly for C-shaped buckle 210, and a spring 211 was designed on one side of C-shaped buckle 210 (as shown in Figure 7-9). The C-shaped buckle 210 would be used to hold one end of the spring 211 for limiting back distance of sleeve 4; additionally, a reversion locking bulge 22 was set to make the bit keep its maximal extension length (see Figure 15) by pressing aftermentioned sleeve backwards to pull out the screw in some parts; and a combination groove 23 was designed for screwdriver 3, and a plural locking bead hole 24 was designed on the combination groove 23 for setting the buckling round bead 240 which can fasten the shank 30 of bit 3 (see Figure 7-9) to integrate the bit 3 with shank 2 for driving; a buckling bead hole 25 was designed for buckling bead 250 which can buckle the lower ring 310 of the edge part 31 of the bit 3 (see Figure 7), or can fasten the edge groove end 311 of edge part 31 of the bit 3 (see Figure 17) for positioning the bit 3 in the said combination groove 23. Just press the sleeve 4 backwards and make the buckling bead 250 loosen the lower ringy cover 310 (see Figure 16) or the edge groove end 311 of the edge part 31 of the bit 3 (see Figure 17) to replace the bit 3, and the bit will separate from the said groove 23, and the user will only need to take the present invention inversely to pour the bit 3 out of the combination groove of the bit 3 fast and conveniently. It can overcome the defect that the user must use a pincers to clip it out as described above. Additionally,

a concaved ring 26 was designed for working with the operation of the position bead 440 of adjusting sleeve 6 of adjusting the locking depth of the screw (see Figure 9-11).

[0008] The sleeve 4 set a perforation 40 designed for the aforesaid shank 2 through, and at the rear of the inner wall of the sleeve was designed an inner ring 41 which can hold another end of spring 211 set on the shank 2, and a gap 410 was designed in the inner ringy cover 41 to work with the operation of locking bulge 22 of the said shank 2. When make the sleeve 4 back to move the locking bulge 22 to the left side of the inner ringy cover 41 via the gap 410 (see Figure 15), the bit 3 will extend to its maximum. It would be good for the combination of the screw locking the parts deeply, and then turn over the screw with hand tool and take out the screw. And a concaved ringy cover 42 was set near the front of the inner wall of the sleeve 4, which can work with the operation of the said buckling round bead 240. When the bit 3 locks the screw to the specified depth, the front edge 43 of the sleeve 4 and the front 62 of the sleeve 6 will hold the part 5 (see Figure 8) or change the distance between the sleeve 4 and the sleeve 6 (see Figure 9, 11 and 12) to make the sleeve 4 back. The less thread the bit 3 locks, the longer distance between the front edge 43 of sleeve 4 and the one 62 of sleeve 6 is. That will make the said buckling round bead 240 enter the concaved ringy cover 42 of sleeve and the buckling round bead 240 will loosen the shank 30 of the bit 3 (see Figure 8 and 12) to make the bit stop and the shank idled. And when the screw was locked to proper depth, the twisting force of bit 3 will be released to avoid the screw's continuous screwing into part 5, exceeding the specified depth. An outer threading 45 was designed, which can adjust the lock of sleeve 6 and has a position bead hole 44 for position bead 440.

[0009] Inner threading 60 was designed on the adjusting sleeve 6 which can be used for locking the outer threading 45 of the aforesaid sleeve 4; and on the inner wall 61 of the adjusting sleeve 6 with a long concaved groove 610 set in singular or plurality. The present invention contains four parts with the purpose to use this long concaved groove to incorporate with the operation of position bead 440 of the said sleeve 4. While adjusting the locking depth of screw, the extension length of the said bit 3, and, the locking position (see Figure 7 and 12) of the adjusting sleeve 6 and the said sleeve 4 should be adjusted and changed firstly respectively, the extension length of the bit. At this time, because the said position bead 440 was designed in the long concaved groove 610 of the said adjusting sleeve 6, the adjusting sleeve 6 and sleeve 4 could be combined fully. By this token, they should be pushed backwards for making the position bead 440 fall into the concaved ringy cover 26 of the said shank 2 (see Figure 9), the position bead 440 will be separated from the long concaved groove 61 and the adjusting sleeve 6 will be driven. After rotating to the specified position, loosen the sleeve 4 and the adjusting

sleeve 6 and push them forwards to the specified position by means of using the force of the said spring 211.

[0010] After the screw is locked into the specified depth, to protect the surface of part 5 from the damage caused by the friction from the front edge 62 of the adjusting sleeve 6, an auxiliary sleeve 63 was designed at the front of the adjusting sleeve 6 above, as shown in Figure 13-14, as the Embodiment 2 of the present invention, in which C-shaped retaining groove 630 was set on the adjusting sleeve 6, and a C-shaped buckle 631 can cover it; and then screw the auxiliary sleeve 63 into the inner side of the front edge of the aforesaid adjusting sleeve 6 (as shown in Figure 16). Additionally, as shown in Embodiment 2, when the locking screw is locked to the specified depth (see Figure 18), the front of auxiliary sleeve 63 reaches the front surface of the part 5 and causes all sleeves back to release the twisting force of the bit 3 and make the bit 3 racing (same as the function in the aforesaid Figure 8), so that the retaining groove of the screw would not be damaged for the friction with bit. However, at this time, the abovementioned shank 2 would be turn continually if the hand tool is still at ON state. Because the friction exists between the position bead 440 and sleeve 4 and the spring would act on the sleeve 4 and shank 2 to drive sleeve 4, and the sleeve 6 also would driven by the sleeve 4. To avoid the slippage produced between the front edge 62 and surface of part 5 for the driving of adjusting sleeve 6, and wear or damage the surface, the function of C-shaped buckle 631 set between the abovementioned adjusting sleeve 6 and auxiliary sleeve 63 is required. However, because the front of the auxiliary sleeve 63 has been touched the surface of part 5, even the adjusting sleeve 6 was driven, only the aforesaid C-shaped buckle 631 can revolve, and the auxiliary sleeve 63 cannot revolve simultaneously, so that the surface of the part 5 can be prevented from damage.

[0011] And the auxiliary sleeve 63 was designed for the circumstance when the said adjusting sleeve 6 was extended to a certain length beyond its maximum, which can be locked with the adjusting sleeve 6 each other and fixed on the front of adjusting sleeve 6, that would make the user fail to see the correct position of bit and meet the screw with it easily. Therefore adjust and narrow the inside diameter of adjusting sleeve to be close to the one of screw's head with auxiliary sleeve 63, the user will directly know the present position of the bit and meet the screw head with it fast for locking. So other than in the embodiment 2, it is practicable, as shown in Embodiment 3 and 4, to screw the aforesaid auxiliary sleeve 63 into the inner side of the front of the adjusting sleeve 6 while the auxiliary sleeve 63 in the Embodiment 4 into the outer side of the front of the abovementioned sleeve 6 for achieving double functions of the auxiliary sleeve designed.

[0012] Thus, the present invention not only can incorporate with the locking of various screws, but also can release the locking torsional force of the bit after the lock-

ing according to the required locking depth of adjusting screw; additionally, the present invention can extend the service life of bit. For its small volume, it can incorporate with any hand tool and will not increase the user's burden.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

- Figure 1, The cutaway view of the prior invention. 10
- Figure 2, The cutaway view when the prior invention locks screw.
- Figure 3, The cutaway view when the prior invention locks screw reversely.
- Figure 4, The disassembly view of Embodiment 1 of the present invention. 15
- Figure 5, The partial disassembly view of the present invention.
- Figure 6, The assembly view of the present invention. 20
- Figure 7, The cutaway view of locking depth of the present invention.
- Figure 8, The cutaway sketch map of the locking screw of the present invention.
- Figure 9, The cutaway view of the adjusting locking depth of the present invention. 25
- Figure 10, The A-A cutaway view as Figure 9.
- Figure 11, The cutaway view after adjusting locking depth of the present invention.
- Figure 12, The cutaway sketch map of the locking screw after adjusting locking depth of the present invention. 30
- Figure 13, The cutaway sketch map of reversion of the present invention.
- Figure 14, The cutaway sketch map while replacing the bit. 35
- Figure 15, The cutaway sketch map while the present invention combines with another kind of bit.
- Figure 16, The cutaway sketch map of the Embodiment 2 of auxiliary sleeve of the present invention. 40
- Figure 17, The B-B cutaway map of the Figure 16.
- Figure 18, The cutaway sketch map of contact surface of the Embodiment 2 and part.
- Figure 19, The cutaway sketch map of the Embodiment 3 of auxiliary sleeve of the present invention. 45
- Figure 20, The cutaway sketch map of the Embodiment 4 of auxiliary sleeve of the present invention.

Claims

1. A Bit Holder comprises:

a rod, on which a combination part and C-shaped retaining groove were designed C-shaped buckle. The one side of the C-shaped buckle was equipped with a spring; additionally, a locking bulge and combination groove was de-

signed respectively, the later one mainly for the bit; in addition, some plural locking bead holes and buckling bead holes were designed for buckling round beads and buckling beads respectively, and the buckling bead can buckle the edge part of the screwdriver; at last, a concaved pentagonal cover was designed for working with the adjusting sleeve with a certain locking depth; and

a bit contains shank and edge part, and a lower ringy cover were designed or not on the edge cover; and

a sleeve, on which a perforation was designed for the said rod; and an inner ringy cover was set, which can hold one end of spring of the rod and has a gap with perforation designed for assorting with the said locking bulge; additionally, a concaved pentagonal cover was set on the inner wall of sleeve, which can work with the esaid locking round bead; in addition, an outer threading was designed for adjusting screw lock of sleeve; in addition, a position bead hole was designed on the outer screw thread for the position bead;

an adjusting sleeve was designed with an inner threading for locking the outer threading of the said sleeve; additionally, a long concaved groove was designed on the inner wall of adjusting sleeve. While using this long concaved groove to assort with the action of the said position bead, the locking position of adjusting sleeve and the said sleeve can be adjusted. Therefore, it can adjust the extension length of bit, work with locking of various screws and release timely locking torsional force of bit after the completion of screw's locking.

2. The Bit Holder, as recited in Claim 1, wherein said the buckling bead of sleeve can buckle the edge groove end of edge part of the bit.

3. The Bit Holder, as recited in Claim 1, wherein said a concaved pentagonal cover was designed on the shank for adjusting the changed combination length between sleeves and fix the position after adjusting.

4. The Bit Holder, as recited in Claim 1, wherein said the long concaved groove of the adjusting sleeve is singular.

5. The Bit Holder, as recited in Claim 1, wherein said the long concaved groove of the adjusting sleeve can be plural.

6. A Bit Holder comprises:

a rod, on which a combination part and C-shaped retaining groove were designed C-

shaped buckle. The one side of the C-shaped buckle was equipped with a spring; additionally, a locking bulge and combination groove was designed respectively, the later one mainly for the bit; in addition, some plural locking bead holes and buckling bead holes were designed for buckling round beads and buckling beads respectively, and the buckling bead can buckle the edge part of the screwdriver; at last, a concaved pentagonal cover was designed for working with the adjusting sleeve with a certain locking depth; and

a bit contains shank and edge part, and a lower ringy cover were designed or not on the edge cover; and

a sleeve, on which a perforation was designed for the said rod; and an inner ringy cover was set, which can hold one end of spring of the rod and has a gap with perforation designed for assorting with the said locking bulge; additionally, a concaved pentagonal cover was set on the inner wall of sleeve, which can work with the aforesaid locking round bead; in addition, an outer threading was designed for adjusting screw lock of sleeve; in addition, a position bead hole was designed on the outer screw thread for the position bead;

an adjusting sleeve was designed with an inner threading for locking the outer threading of the said sleeve; additionally, a long concaved groove was designed on the inner wall of adjusting sleeve. While using this long concaved groove to assort with the action of the said position bead, the locking position of adjusting sleeve and the said sleeve can be adjusted. Therefore, it can adjust the extension length of bit, work with locking of various screws and release timely locking torsional force of bit after the completion of screw's locking; and

an auxiliary sleeve, which was designed on the front of the adjusting sleeve with a C-shaped retaining groove a C-shaped buckle can cover. And make the auxiliary sleeve cover the front edge the aforesaid adjusting sleeve to combine them and keep slip, so that them can be disassembled conveniently.

7. The Bit Holder, as recited in Claim 6, wherein said an auxiliary sleeve can be set within the front of the adjusting sleeve. 50

8. The present invention provides a kind of Bit Holder containing:

a rod, on which a combination part was designed which can incorporate with hand tool; additionally, a C-shaped retaining groove was set particularly for C-shaped buckle, and a reversion

locking bulge was designed particularly for pulling out screw; in addition, some plural locking bead holes and buckling bead holes were designed for buckling round beads and buckling beads respectively; and concaved pentagonal cover was designed for working with the adjusting sleeve with certain locking depth; at last, a combination groove of bit was designed on the front of rod; and

a sleeve, on which a perforation was designed for the said rod; and an inner ringy cover was set, which can hold one end of spring of the rod and has some perforations for the said locking bulge; additionally, an outer threading was designed for adjusting screw lock of sleeve; in addition, a position bead hole was designed on the outer screw thread for the position bead; and an adjusting sleeve was designed with an inner threading for locking the outer threading of the aforesaid sleeve; additionally, a long concaved groove was designed on the inner wall of adjusting sleeve. While using this long concaved groove to assort with the action of the said position bead, the locking position of adjusting sleeve and the said sleeve can be adjusted. Therefore, it can adjust the extension length of bit, work with locking depth of various screws and release timely locking torsional force of bit after the completion of screw's locking.

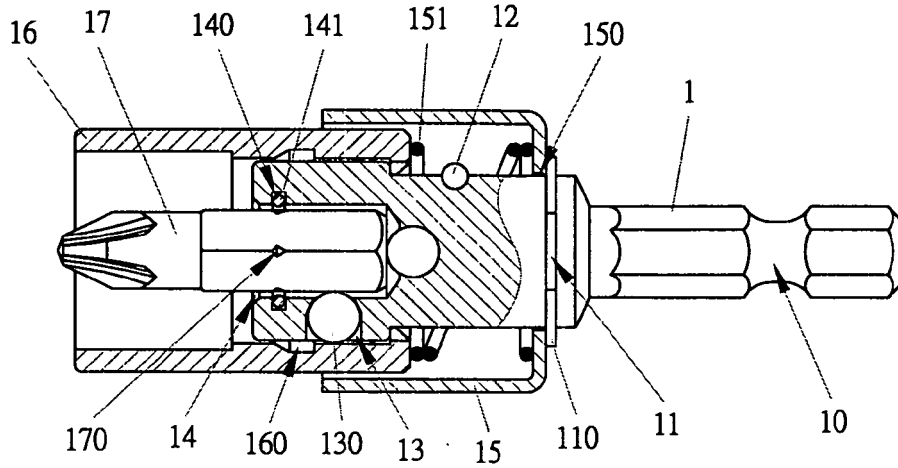


FIG 1 (PRIOR ART)

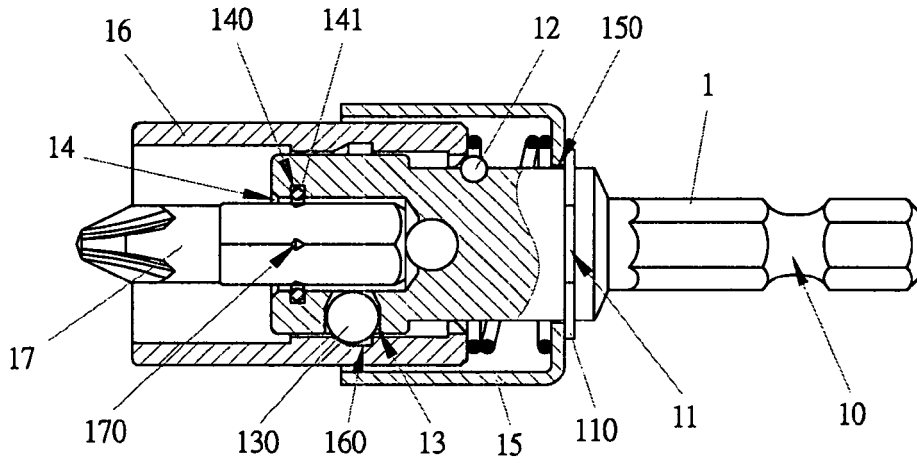


FIG 2 (PRIOR ART)

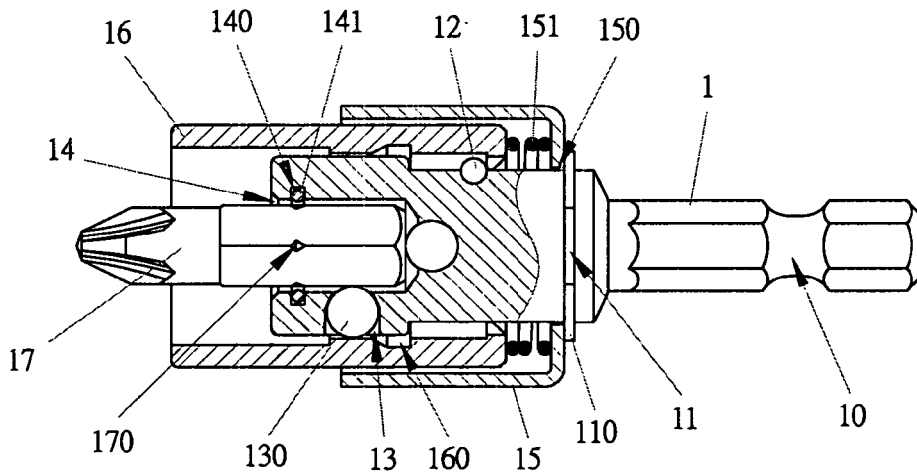


FIG 3 (PRIOR ART)

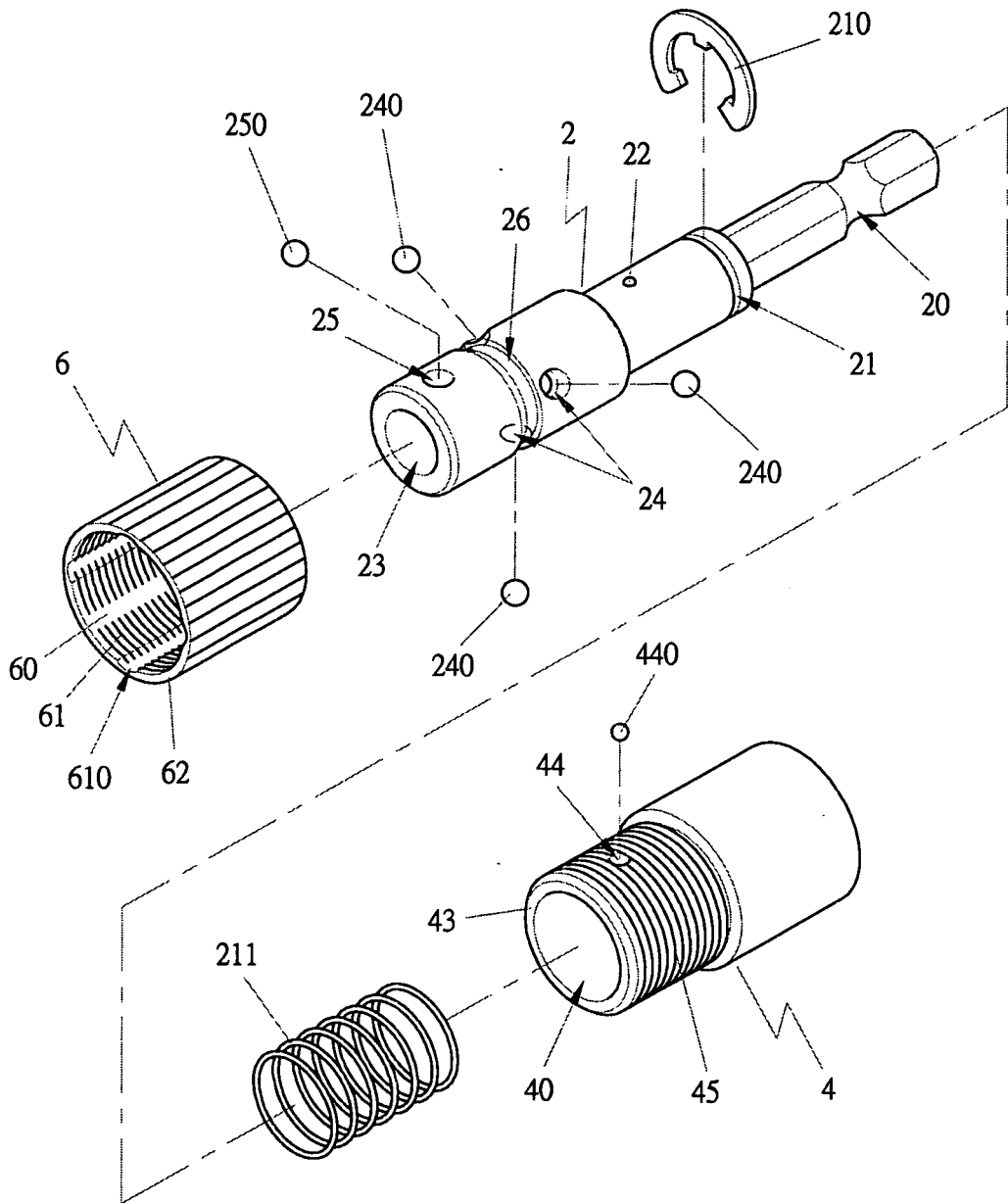


FIG 4

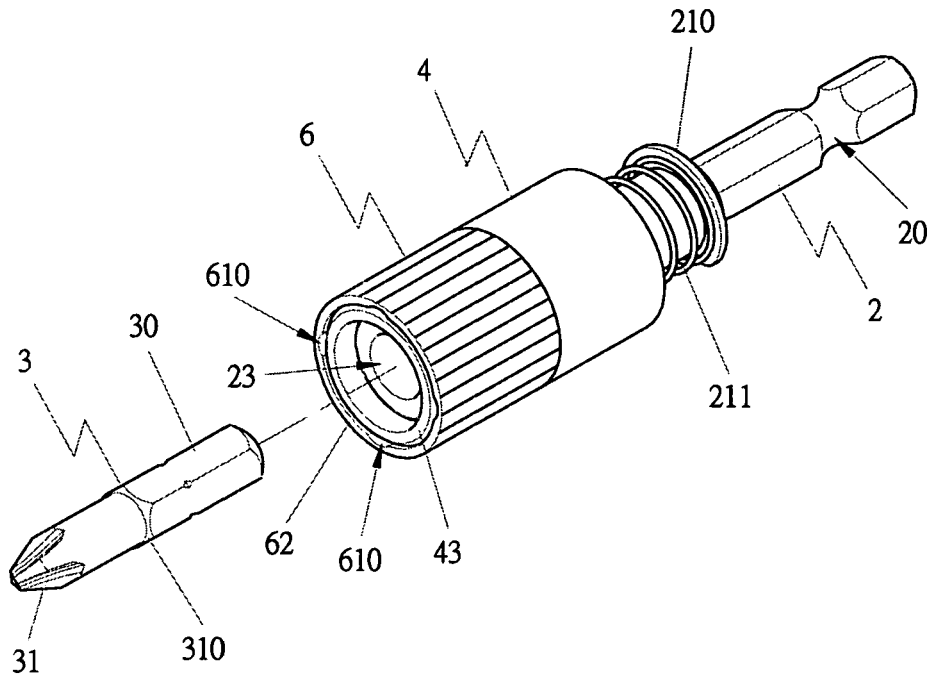


FIG 5

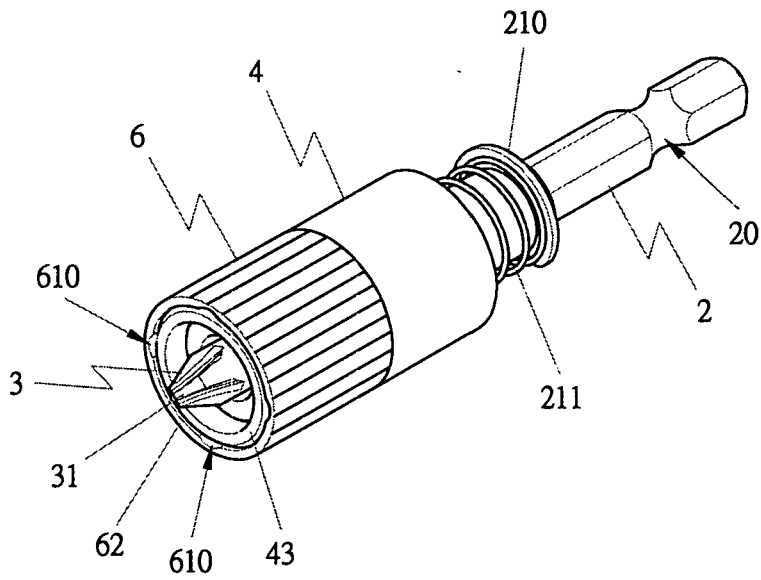


FIG 6

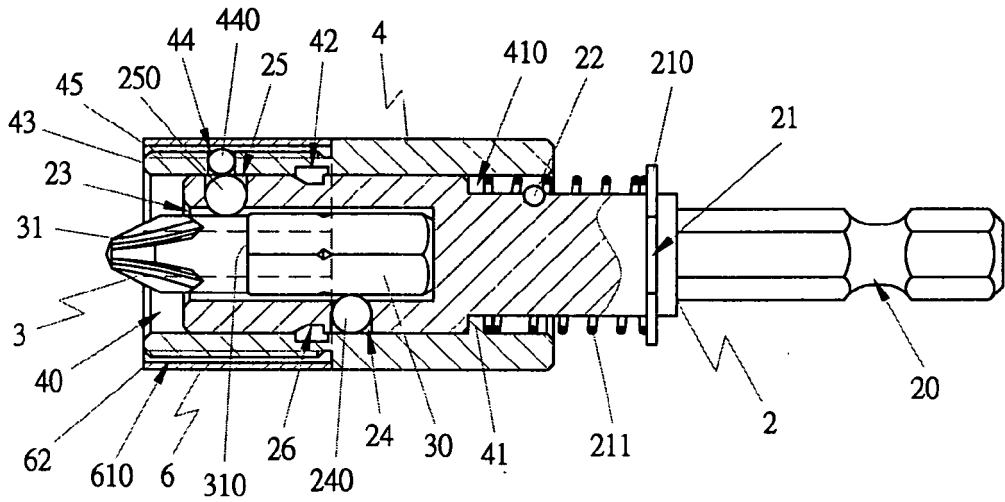


FIG 7

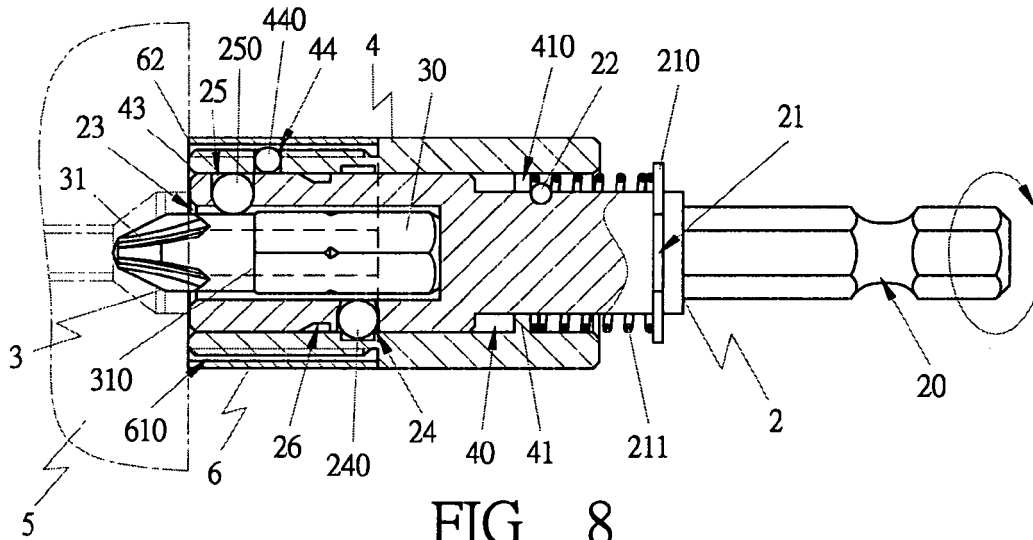


FIG 8

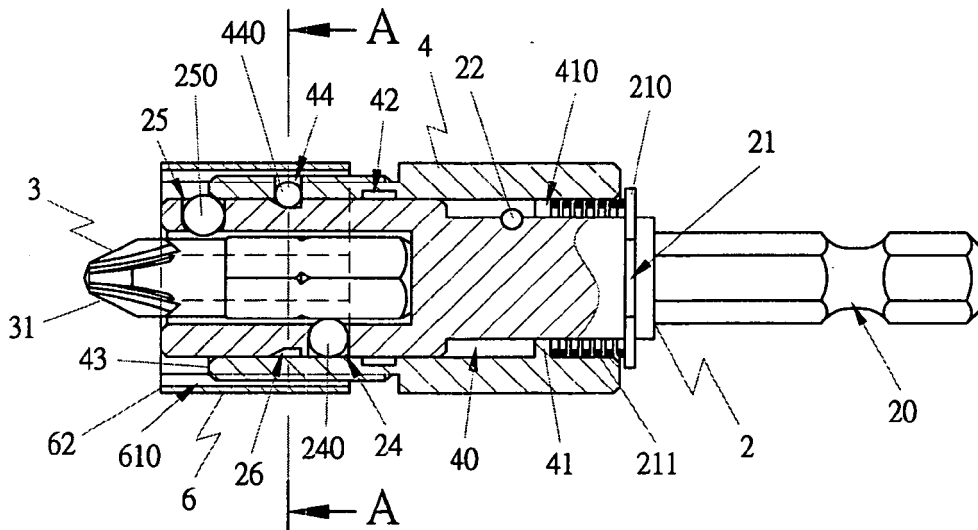


FIG 9

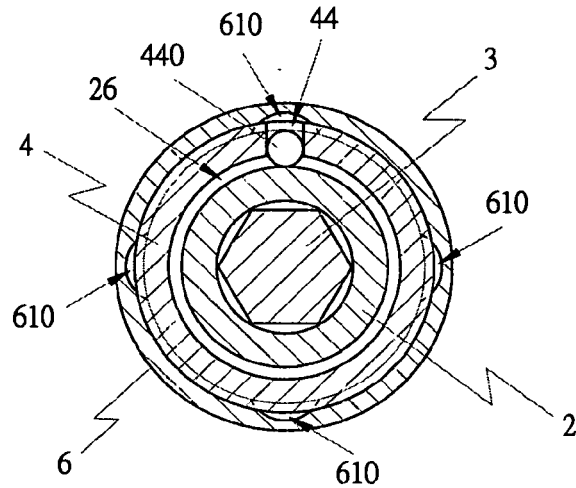


FIG 10

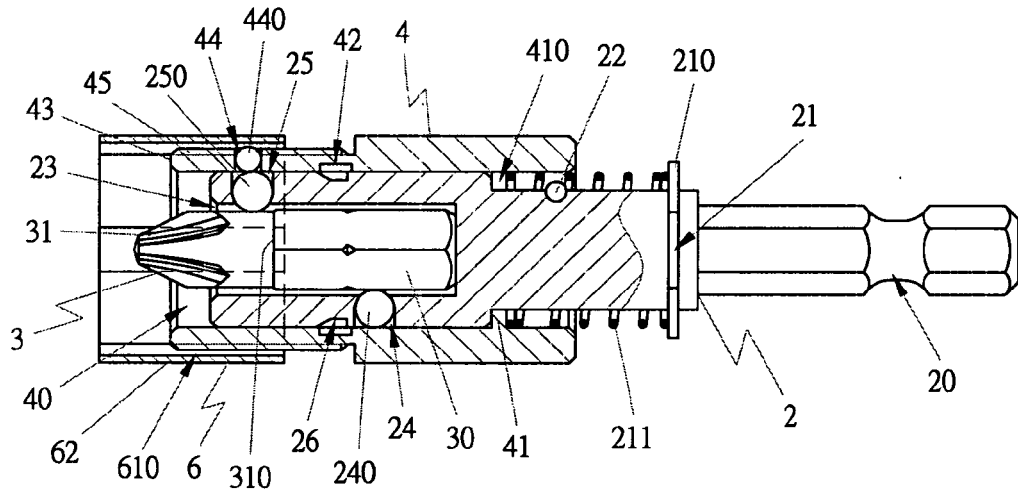


FIG 11

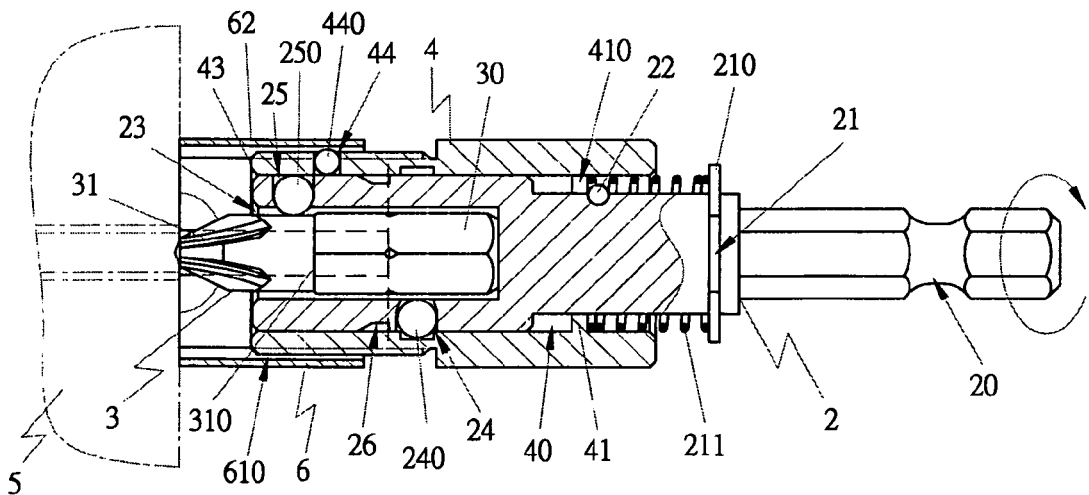


FIG 12

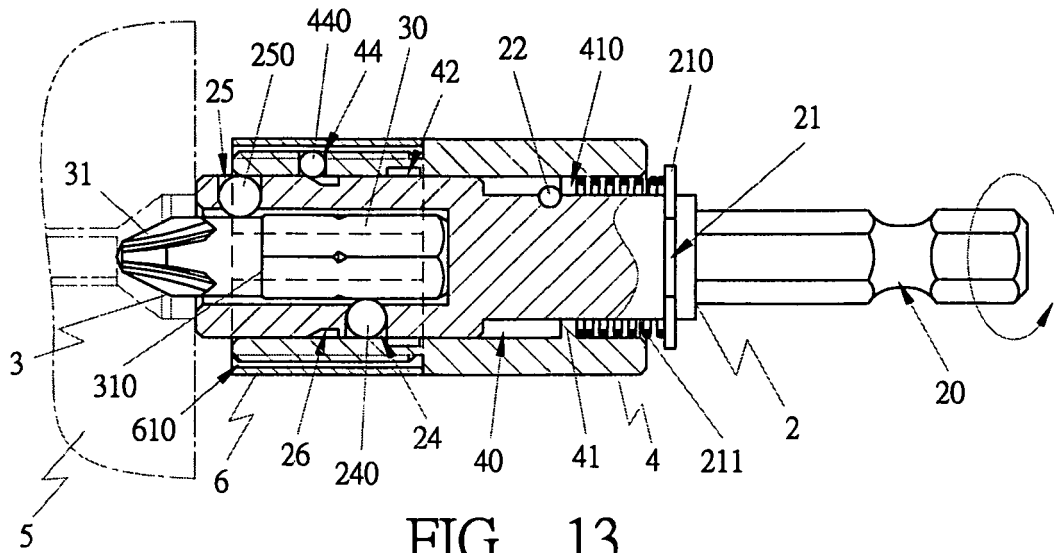


FIG 13

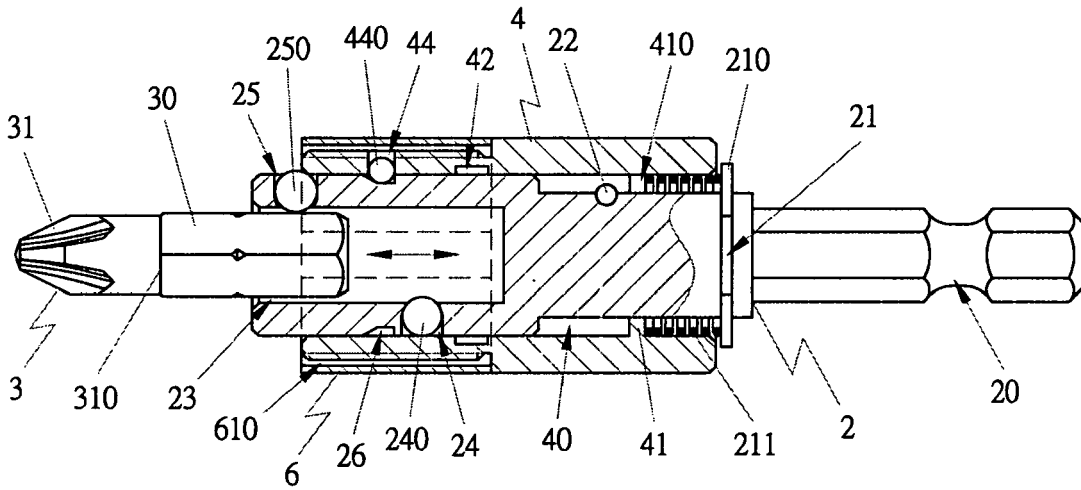


FIG 14

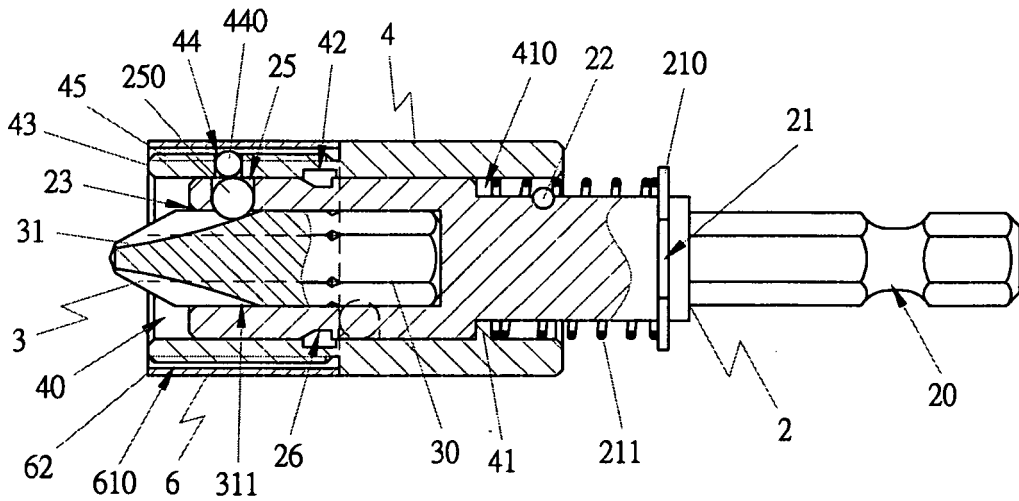


FIG 15

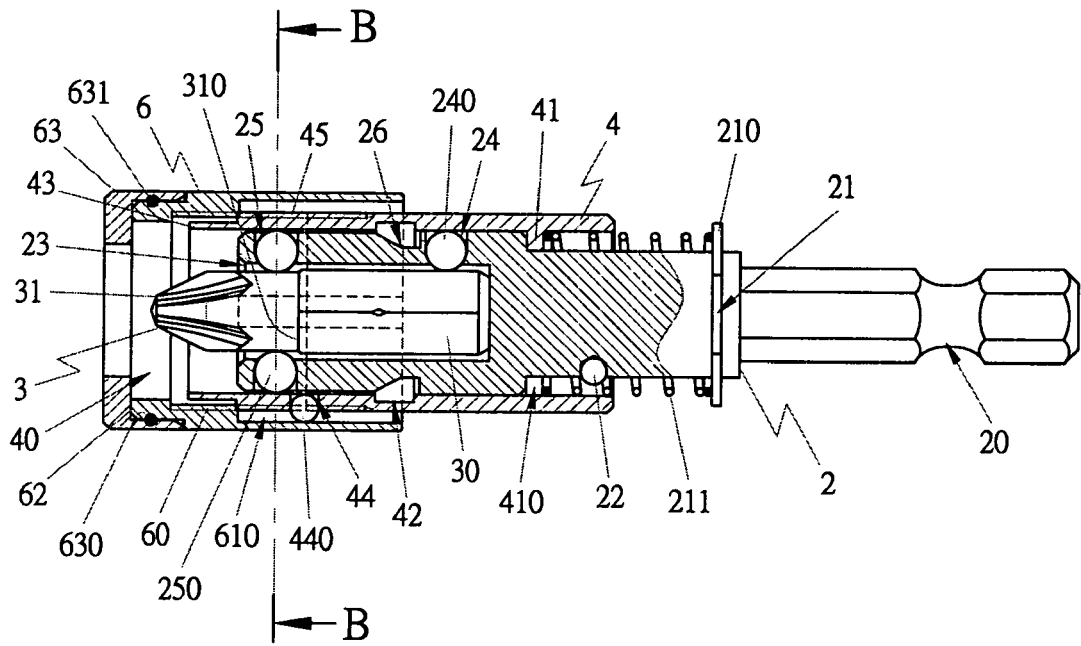


FIG 16

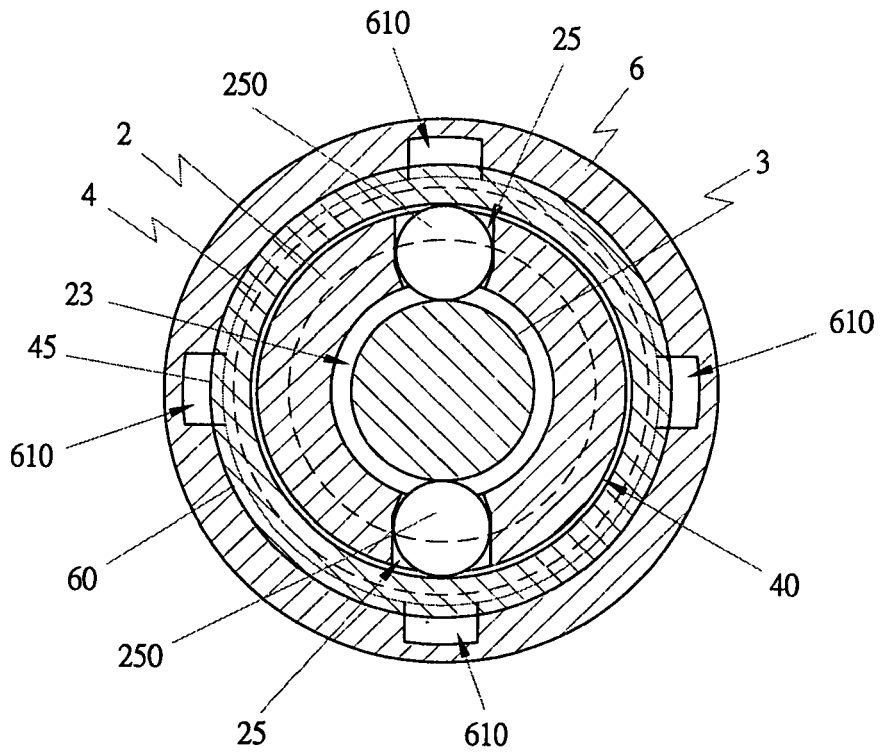


FIG 17

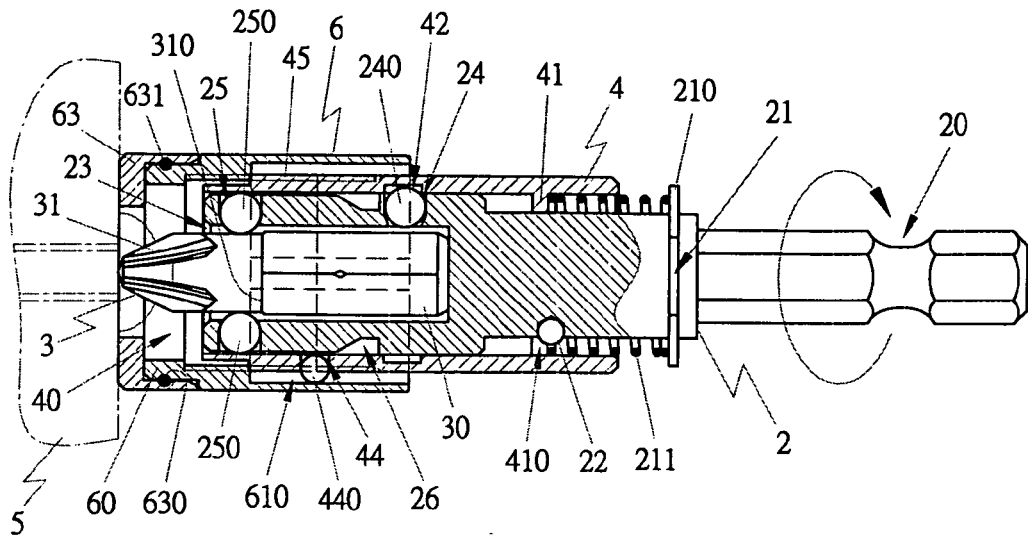


FIG 18

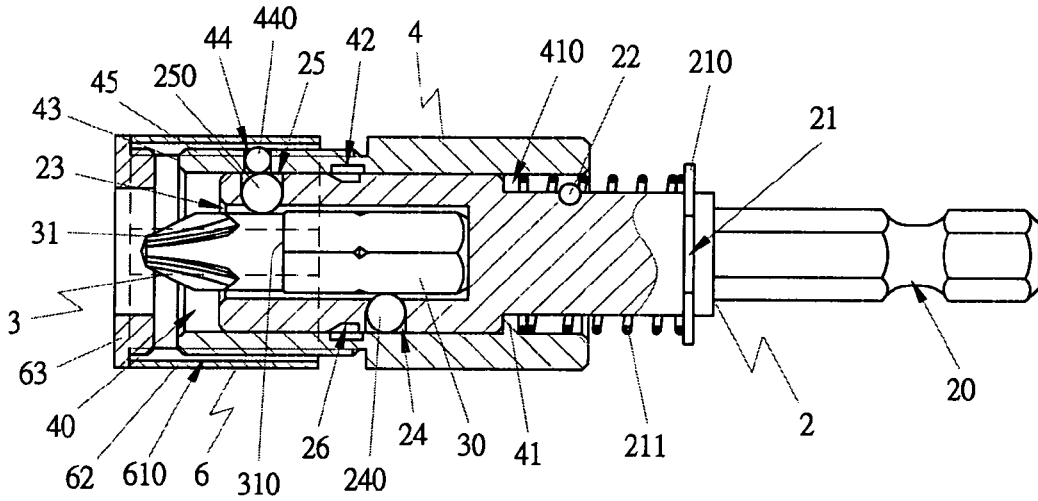


FIG 19

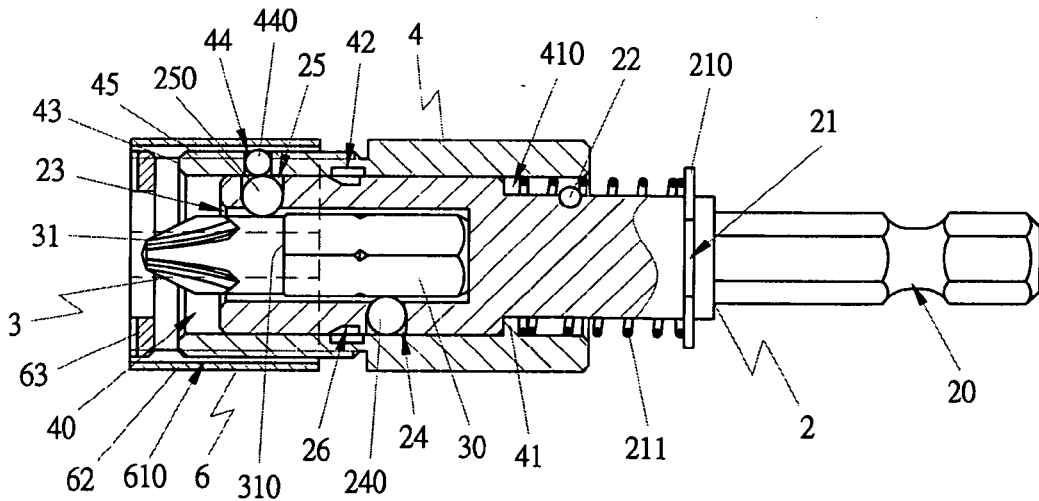


FIG 20



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 33 30 962 A1 (BEYHL, EBERHARD, DIPL.-ING) 21 March 1985 (1985-03-21) * page 6, line 18 - line 20 * * page 9, line 1 - line 5; figures 1-3 * -----	1,6,8	B25B23/00
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 June 2005	Examiner Carmichael, Guy
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EPC FORM 1503 03 82 (P04G01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 00 2619

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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