

FASCICULE DE BREVET D'INVENTION

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54 Titre : An automatic brake adjuster system.

100

57 **Abrégé :** The present invention relates to an automatic brake adjuster system 100 comprising a striker cam 200, a structural latch 300 and a pawl sector 400 either in isolation or in some combination. The striker cam 200 is statically balanced through one or more recesses 230 in a first lobe 220 or a second lobe 240 acting as counter-mass or a combination of both. The structural latch 300 is statically balanced through one or more recesses 330 in a first lobe 320 or a second lobe 340 acting as counter mass or a combination of both. The pawl sector 400 is statically balanced through one or more recesses 430 in a first lobe 420 or a second lobe 440 acting as counter-mass or a combination of both.

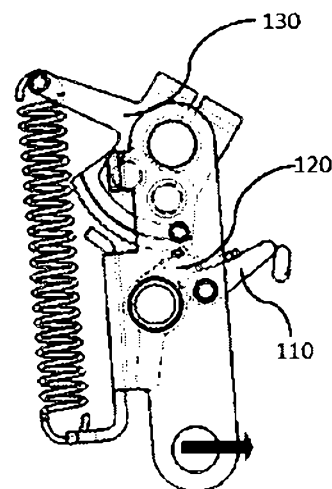
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Figure 1A

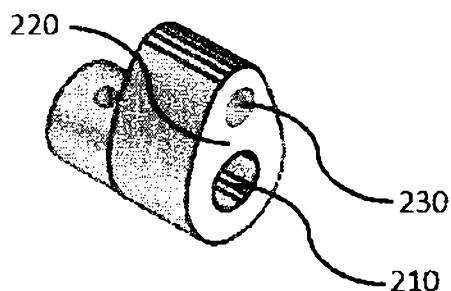
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Figure 3A

Reference Figure - 1A, 2A, 3A.

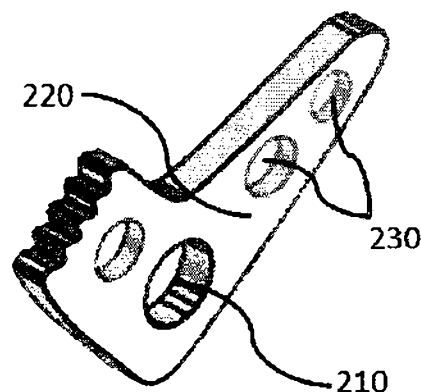


Figure 2A

TITLE OF INVENTION**An Automatic Brake Adjuster System****FIELD OF THE INVENTION**

[001] The present invention generally relates to an automatic brake adjuster system.

5 BACKGROUND OF THE INVENTION

[002] Fundamentally, all forms of pneumatic or mechanical drum brakes that are implemented in different kinds of vehicles, such as commercial vehicles or saddle type vehicles, cause retardation through application of friction. When the brakes of the vehicles are actuated, through pneumatic, mechanical or
10 other different means, brake shoes contact a surface that rotates along with the wheel. Due to the friction created on contact, the linings on the brake shoes and the surface undergo wear and tear. Over time, due to friction, the clearance (or slack), i.e., the mechanical distance between the brake shoes and the surface to make contact with, increases. With an ever-increasing
15 clearance, the range of motion of the brake shoes increases that may create a delay in braking response when a driver actuates the brakes.

[003] Conventionally, an automatic brake adjuster system is used to minimize or eliminate the clearance. However, due to eccentric mass in different parts of the automatic brake adjuster system, a false adjustment
20 tends to occur. The false adjustment would not be proportional to the wear

and tear in the linings, and consequently, would overshoot or undershoot from the required adjustment causing sudden failing or jamming of brakes.

[004] Thus, there is a need in the art for an improved automatic brake adjuster system which can address at least the aforementioned problems and
5 limitations.

SUMMARY OF THE INVENTION

[005] In one aspect, the present invention is directed to an automatic brake adjuster system having a striker cam, a structural latch and a pawl sector.
10 The striker cam is configured to receive a memory latch and is capable of being rotated about the memory latch. The striker cam is statically balanced. The structural latch is configured to be in communication with the memory latch. The pawl sector is configured to be in communication with the structural latch.

15 [006] In an embodiment, the striker cam includes a slot and a first lobe. The slot is configured to receive the memory latch. The first lobe extends from the slot and has one or more recesses. The one or more recesses shift centre of mass of the striker cam towards a centre of the slot, hence, statically balance the striker cam.

20 [007] In another embodiment, the striker cam includes a slot, a first lobe and a second lobe. The slot is configured to receive the memory latch. The first lobe extends from the slot. The second lobe extends from the slot and acts as

counter-mass thereby, shifting centre of mass of the striker cam towards a centre of the slot, hence, statically balancing the striker cam.

[008] In another embodiment, the striker cam includes a slot, a first lobe and a second lobe. The slot is configured to receive the memory latch. The first
5 lobe extends from the slot and has one or more recesses. The second lobe extends from the slot and acts as counter-mass. The one or more recesses and the second lobe thereby, shift centre of mass of the striker cam towards a centre of the slot, hence, statically balancing the striker cam.

[009] In another aspect, the present invention is directed to an automatic
10 brake adjuster system having a striker cam, a structural latch and a pawl sector. The striker cam is configured to receive a memory latch and is capable of rotating about the memory latch. The structural latch is configured to be in communication with the memory latch. The structural latch is statically balanced. The pawl sector is configured to be in communication with the
15 structural latch.

[010] In an embodiment, the structural latch includes a slot and a first node. The structural latch is configured to rotate about the slot. The first node extends from the slot and has one or more recesses. The one or more recesses shift centre of mass of the structural latch towards a centre of the
20 slot, hence, statically balancing the structural latch.

[011] In another embodiment, the structural latch includes a slot, a first node and a second node. The structural latch is configured to rotate about the slot.

The first node extends from the slot. The second node extends from the slot and acts as counter-mass thereby, shifting centre of mass of the structural latch towards a centre of the slot and hence, statically balancing the structural latch.

5 [012] In another embodiment, the structural latch includes a slot, a first node and a second node. The structural latch is configured to rotate about the slot. The first node extends from the slot and has one or more recesses. The second node extends from the slot and acts as counter-mass. The one or more recesses and the second node thereby, shift centre of mass of the
10 structural latch towards a centre of the slot, hence, statically balancing the structural latch.

[013] In another aspect, the present invention is directed to an automatic brake adjuster system having a striker cam, a structural latch and a pawl sector. The striker cam is configured to receive a memory latch and is
15 capable of rotating about the memory latch. The structural latch is configured to be in communication with the memory latch. The pawl sector is configured to be in communication with the structural latch. The pawl sector is statically balanced.

[014] In an embodiment, the pawl sector includes a slot and a first node. The
20 pawl sector is configured to rotate about the slot. The first node, having a curvilinear profile at one end, extends from the slot and has one or more

recesses thereby, shifting centre of mass of the pawl sector towards a centre of the slot, hence, statically balancing the pawl sector.

[015] In another embodiment, the pawl sector includes a slot, a first node and a second node. The pawl sector is configured to rotate about the slot.

5 The first node, having a curvilinear profile at one end, extends from the slot. The second node extends from the slot and acts as counter-mass thereby, shifting centre of mass of the pawl sector towards a centre of the slot hence statically balancing the pawl sector.

[016] In another embodiment, the pawl sector includes a slot, a first node

10 and a second node. The pawl sector is configured to rotate about the slot.

The first node, having a curvilinear profile at one end, extends from the slot and has one or more recesses. The second node extends from the slot and acts as counter-mass. The one or more recesses and the second node thereby, shift centre of mass of the pawl sector towards a centre of the slot,

15 hence, statically balancing the pawl sector.

BRIEF DESCRIPTION OF THE DRAWINGS

[017] Reference will be made to embodiments of the invention, examples of which may be illustrated in accompanying figures. These figures are intended

20 to be illustrative, not limiting. Although the invention is generally described in context of these embodiments, it should be understood that it is not intended to limit the scope of the invention to these particular embodiments.

Figure 1A illustrates a typical automatic brake adjuster system.

Figure 1B illustrates another typical automatic brake adjuster system.

Figures 2A, 2B and 2C illustrate an isometric view of a striker cam of an automatic brake adjuster system, in accordance with an embodiment of
5 the present invention.

Figures 3A, 3B and 3C illustrate an isometric view of a striker cam of an automatic brake adjuster system, in accordance with an embodiment of the present invention.

Figures 4A, 4B and 4C illustrate an isometric view of a structural latch
10 of the automatic brake adjuster system, in accordance with an embodiment of the present invention.

Figure 5A, 5B and 5C illustrate a perspective view of a structural latch of the automatic brake adjuster system, in accordance with an embodiment of the present invention.

15 Figures 6A, 6B and 6C illustrate an isometric view of a pawl sector of the automatic brake adjuster system, in accordance with an embodiment of the present invention.

Figures 7A, 7B and 7C illustrate a perspective view of a pawl sector of the automatic brake adjuster system, in accordance with an embodiment of
20 the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[018] Various features and embodiments of the present invention here will be discernible from the following further description thereof, set out hereunder.

5 [019] The present invention generally relates to an automatic brake adjuster system.

[020] Figure 1A illustrates a typical automatic brake adjuster system 100 and Figure 1B illustrates another typical automatic brake adjuster system 100. The automatic brake adjuster system 100 includes a striker cam 110, a
10 structural latch 120 and a pawl sector 130. As illustrated in Figure 1B, the striker cam 110 is configured to receive a first end (not shown) of a memory latch 140. The structural latch 120 is in communication with a second end (not shown) of the memory latch 140. Further, the pawl sector 130 is configured to be in communication with the structural latch 120. The striker
15 cam 110 is rotatably actuated when a driver of a vehicle actuates a brake (not shown) in communication with the automatic brake adjuster system 100. The rotational motion of the striker cam 110 causes the memory latch 140 to rotate about its axis, and as a consequence, actuates the structural latch 120. The structural latch 120 being in communication with the pawl sector 130
20 causes the pawl sector 130 to be actuated. The pawl sector 130 is in communication with brake shoes (not shown) of the brake of the vehicle.

[021] The striker cam 110 of the automatic brake adjuster system 100 includes a first lobe (not shown) extending from a slot (not shown). The first lobe, being an eccentric mass, causes centre of mass of the striker cam 110 to shift away from a centre of the slot, hence, the striker cam 110 is statically
5 unbalanced. Any shock load acting on the eccentric mass of the striker cam 110 causes an unintended false adjustment that is not proportional to the wear and tear.

[022] The structural latch 120 of the automatic brake adjuster system 100 includes a first node (not shown) extending from a slot (not shown). The first
10 node, being an eccentric mass, causes centre of mass of the structural latch 120 to shift away from a centre of the slot, hence, the structural latch 120 is statically unbalanced. Any shock load acting on the eccentric mass of the structural latch 120 causes an unintended false adjustment that is not proportional to the wear and tear.

[023] The pawl sector 130 of the automatic brake adjuster system 100 includes a first node (not shown) extending from a slot (not shown). The first
15 node, being an eccentric mass, causes centre of mass of the pawl sector 130 to shift away from a centre of the slot, hence, the pawl sector 130 is statically unbalanced. Any shock load acting on the eccentric mass of the pawl sector
20 130 causes an unintended false adjustment that is not proportional to the wear and tear.

[024] Figures 2A and 3A illustrate an isometric view of a striker cam 200 of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The striker cam 200 includes a slot 210 and a first lobe 220 that extends from the slot 210. The slot 210 is configured to receive the memory latch 140. The first lobe 220 has one or more recesses 230 configured to remove eccentric mass of the first lobe 220. The one or more recesses 230 shift centre of mass of the striker cam 200 towards a centre of the slot 210 resulting in statically balanced striker cam 200.

[025] Figures 2B and 3B illustrate an isometric view of a striker cam 200 of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The striker cam 200 includes a slot 210, a first lobe 220 and a second lobe 240. The slot 210 is configured to receive the memory latch 140. The first lobe 200 and the second lobe 240 extend from the slot 210. The second lobe 240 acts as counter-mass to the first lobe 220 and thus, shifts centre of mass of the striker cam 200 towards a centre of the slot 210 that resulting in statically balanced striker cam 200.

[026] Figures 2C and 3C illustrate an isometric view of a striker cam 200 of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The striker cam 200 includes a slot 210, a first lobe 220 and a second lobe 240. The slot 210 is configured to receive the memory latch 140. The first lobe 200 and the second lobe 240 extend from the slot 210. The first lobe 220 has one or more recesses 230

configured to remove eccentric mass of the first lobe 220. The second lobe 240 acts as counter-mass to the first lobe 220. The one or more recesses 230 and the second lobe 240 acting as counter-mass to the first lobe 220, shift centre of mass of the striker cam 200 towards a centre of the slot 210 that
5 resulting in statically balanced striker cam 200.

[027] Figures 4A and 5A illustrate an isometric view of a structural latch 300 and a perspective view of a structural latch 300 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The structural latch 300 includes a slot 310 and a first
10 node 320. The structural latch 300 is configured to rotate about the slot 310. The first node 320 extends from the slot 310 and has one or more recesses 330 configured to remove eccentric mass of the first node 320. The one or more recesses 330 shift centre of mass of the structural latch 300 towards a centre of the slot 310 resulting in statically balanced structural latch 300.

15 [028] Figures 4B and 5B illustrate an isometric view of a structural latch 300 and a perspective view of a structural latch 300 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The structural latch 300 includes a slot 310, a first node 320 and a second node 340. The structural latch 300 is configured to rotate
20 about the slot 310. The first node 320 and the second node 340 extend from the slot 310. The second node 340 acts as counter-mass to the first node 320

and thus, shifts centre of mass of the structural latch 300 towards a centre of the slot 310 resulting in statically balanced structural latch 300.

[029] Figures 4C and 5C illustrate an isometric view of a structural latch 300 and a perspective view of a structural latch 300 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The structural latch 300 includes a slot 310, a first node 320 and a second node 340. The structural latch 300 is configured to rotate about the slot 310. The first node 320 and the second node 340 extend from the slot 310. The one or more recesses 330 and the second node 340 acting
5 as counter-mass to the first node 320, shift centre of mass of the structural latch 300 towards a centre of the slot 310 resulting in statically balanced structural latch 300.
10

[030] Figures 6A and 7A illustrate an isometric view of a pawl sector 400 and a perspective view of a pawl sector 400 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The pawl sector 400 includes a slot 410 and a first node 420. The pawl sector 400 is configured to rotate about the slot 410. The first node 420 extends from the slot 410 and has a curvilinear profile at one end. Further, the first node 420 has one or more recesses 430 configured to
15 remove eccentric mass of the first node 420. The one or more recesses 430 shift centre of mass of the pawl sector 400 towards a centre of the slot 410 resulting in statically balanced pawl sector 400.
20

[031] Figures 6B and 7B illustrate an isometric view of a pawl sector 400 and a perspective view of a pawl sector 400 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The pawl sector 400 includes a slot 410, a first node 420 and a second node 440. The pawl sector 400 is configured to rotate about the slot 410. The first node 420 and the second node 440 extend from the slot 410 and the first node 420 has a curvilinear profile at one end. The second node 440 acts as counter-mass to the first node 420 and thus, shifts centre of mass of the pawl sector 400 towards a centre of the slot 410 resulting in statically balanced pawl sector 400.

[032] Figures 6C and 7C illustrate an isometric view of a pawl sector 400 and a perspective view of a pawl sector 400 respectively of an improved automatic brake adjuster system 100, in accordance with an embodiment of the present invention. The pawl sector 400 includes a slot 410, a first node 420 and a second node 440. The pawl sector 400 is configured to rotate about the slot 410. The first node 420 and the second node 440 extend from the slot 410 and the first node 420 has a curvilinear profile at one end. Further, the first node 420 has one or more recesses 430 configured to remove eccentric mass of the first node 420 and the second node 440 acts as counter-mass to the first node 420. The one or more recesses 430 and the second node 440 acting as counter-mass to the first node 420, shift centre of

mass of the pawl sector 400 towards a centre of the slot 410 resulting in statically balanced pawl sector 400.

[033] The improved automatic brake adjuster system 100 includes the statically balanced striker cam 200, the statically balanced structural latch 300
5 and the statically balanced pawl sector 400 either in isolation or in combination to statically balance the improved automatic brake adjuster system 100 in entirety.

[034] Advantageously, the present invention discloses an improved automatic brake adjuster system that includes a statically balanced striker
10 cam, a statically balanced structural latch, and a statically balanced pawl sector either in isolation or in combination. Thus, the improved automatic brake adjuster system achieves better static balancing over the typical automatic brake adjuster system. Consequently, occurrence of false adjustment unproportionally to the actual wear and tear is eliminated. Thus.
15 sudden failing or jamming of brakes would not occur.

[035] While the present invention has been described with respect to certain embodiments, it will be apparent to those skilled in the art that various changes and modification may be made without departing from the scope of the invention as defined in the following claims.

WE CLAIM:

1. An automatic brake adjuster system (100), comprising:
 - a striker cam (200), the striker cam (200) being configured to receive a memory latch (140), the striker cam (200) being capable of rotating about the memory latch (140), the striker cam (200) being statically balanced;
 - 5 a structural latch (120) configured to be in communication with the memory latch (140); and
 - a pawl sector (130) configured to be in communication with the structural latch (120).
- 10 2. The automatic brake adjuster system (100) as claimed in claim 1, wherein the striker cam (200) comprises:
 - a slot (210) configured to receive the memory latch (140); and
 - a first lobe (220) extending from the slot (210), the first lobe (220) having
 - 15 one or more recesses (230), the one or more recesses (230) thereby, shifting centre of mass of the striker cam (200) towards a centre of the slot (210), hence statically balancing the striker cam (200).
- 20 3. The automatic brake adjuster system (100) as claimed in claim 1, wherein the striker cam (200) comprises:
 - a slot (210) configured to receive the memory latch (140);
 - a first lobe (220) extending from the slot (210), and

a second lobe (240) extending the slot (210), the second lobe (240) acting as counter-mass thereby, shifting centre of mass of the striker cam (200) towards a centre of the slot (210), hence, statically balancing the striker cam (200).

5

4. The automatic brake adjuster system (100) as claimed in claim 1, wherein the striker cam (200) comprises:

a slot (210) configured to receive the memory latch (140);

- 10 a first lobe (220) extending from the slot (210), the first lobe (220) having one or more recesses (230); and

- a second lobe (240) extending from the slot (210), the second lobe (240) acting as counter-mass, the one or more recesses (230) and the second lobe (240) thereby, shifting centre of mass of the striker cam (200) towards a centre of the slot (210), hence, statically balancing the striker cam (200).
- 15

5. An automatic brake adjuster system (100), comprising:

- a striker cam (110), the striker cam (110) being configured to receive a memory latch (140), the striker cam (110) being capable of rotating about the memory latch (140);
- 20

a structural latch (300) configured to be in communication with the memory latch (140), the structural latch (300) being statically balanced; and

5 a pawl sector (130) configured to be in communication with the structural latch (300).

6. The automatic brake adjuster system (100) as claimed in claim 5, wherein the structural latch (300) comprises:

10 a slot (310), the structural latch (300) being configured to rotate about the slot (310); and

a first node (320) extending the slot (310), the first node (320) having one or more recesses (330), the one or more recesses (330) thereby, shifting centre of mass of the structural latch (300) towards a centre of the slot (310), hence statically balancing the structural latch (300).

15

7. The automatic brake adjuster system (100) as claimed in claim 5, wherein the structural latch (300) comprises:

a slot (310), the structural latch (300) being configured to rotate about the slot (310); a first node (320) extending from the slot (310), and

20 a second node (340) extending the slot (310), the second node (340) acting as counter-mass thereby, shifting centre of mass of the structural

latch (300) towards a centre of the slot (310), hence, statically balancing the structural latch (300).

8. The automatic brake adjuster system (100) as claimed in claim 5, wherein
5 the structural latch (300) comprises:
a slot (310), the structural latch (300) being configured to rotate about the slot (310);
a first node (320) extending from the slot (310), the first node (320) having one or more recesses (330); and
10 a second node (340) extending from the slot (310), the second node (340) acting as counter-mass, the one or more recesses (330) and the second node (340) thereby, shifting centre of mass of the structural latch (300) towards a centre of the slot (310), hence, statically balancing the structural latch (300).
15
9. An automatic brake adjuster system (100), comprising:
a striker cam (110), the striker cam (110) being configured to receive a memory latch (140), the striker cam (110) being capable of rotating about the memory latch (140);
20 a structural latch (120) configured to be in communication with the memory latch (140); and

a pawl sector (400) configured to be in communication with the structural latch (120), the pawl sector (400) being statically balanced.

10. The automatic brake adjuster system (100) as claimed in claim 9, wherein

5 the pawl sector (400) comprises:

a slot (410), the pawl sector (400) being configured to rotate about the slot (410); and

a first node (420) extending from the slot (410), the first node (420) having a curvilinear profile at one end, the first node (420) having one or more
10 recesses (430) in the first node (420), the one or more recesses (430) thereby, shifting centre of mass of the pawl sector (400) towards a centre of the slot (410), hence, statically balancing the pawl sector (400).

11. The automatic brake adjuster system (100) as claimed in claim 9, wherein

15 the pawl sector (400) comprises:

a slot (410), the pawl sector (400) being configured to rotate about the slot (410); a first node (420) extending from the slot (410), the first node (420) having a curvilinear profile at one end; and

a second node (440) extending from the slot (410), the second node (440) acting as counter-mass thereby, thereby, shifting centre of mass of the
20 pawl sector (400) towards a centre of the slot (410), hence, statically balancing the pawl sector (400).

12. The automatic brake adjuster system (100) as claimed in claim 9, wherein the pawl sector (400) comprises:

5 a slot (410), the pawl sector (400) being configured to rotate about the slot (410); a first node (420) extending from the slot (410), the first node (420) having a curvilinear profile at one end, the first node (420) having one or more recesses (430); and

a second node (440) extending from the slot (410), the second node (440) having a curvilinear profile, the second node (440) acting as counter-
10 mass, the one or more recesses (430) and the second node (440) thereby, shifting centre of mass of the pawl sector (400) towards a centre of the slot (410), hence, statically balancing the pawl sector (400).

ABSTRACT**An Automatic Brake Adjuster System**

The present invention relates to an automatic brake adjuster system 100 comprising a striker cam 200, a structural latch 300 and a pawl sector 400 either in isolation or in some combination. The striker cam 200 is statically
5 balanced through one or more recesses 230 in a first lobe 220 or a second lobe 240 acting as counter-mass or a combination of both. The structural latch 300 is statically balanced through one or more recesses 330 in a first lobe 320 or a second lobe 340 acting as counter-mass or a combination of both. The pawl sector 400 is statically balanced through one or more
10 recesses 430 in a first lobe 420 or a second lobe 440 acting as counter-mass or a combination of both.

Reference Figure - 1A, 2A, 3A

100

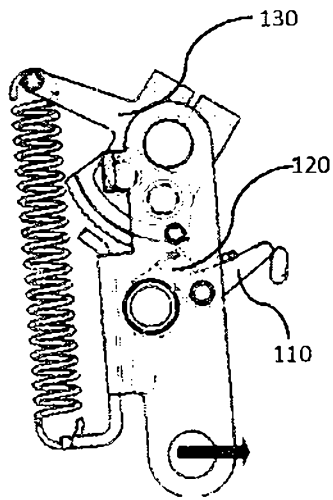


Figure 1A

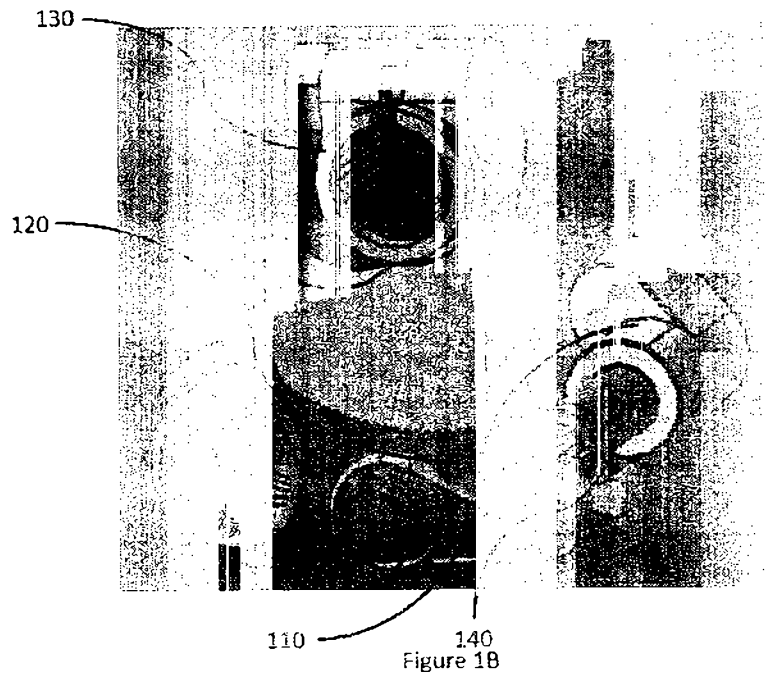


Figure 1B

200

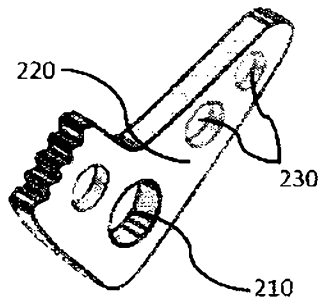


Figure 2A

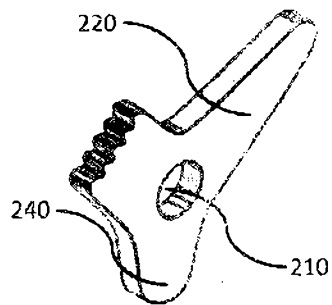


Figure 2B

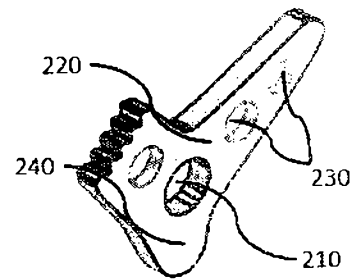


Figure 2C

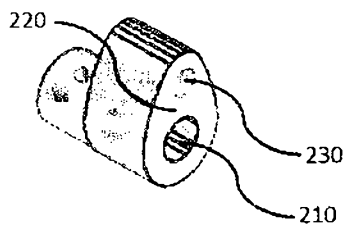
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Figure 3A

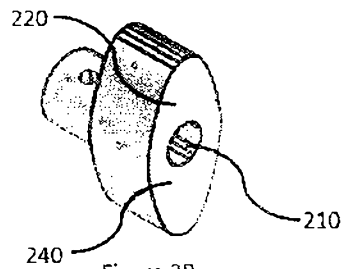


Figure 3B

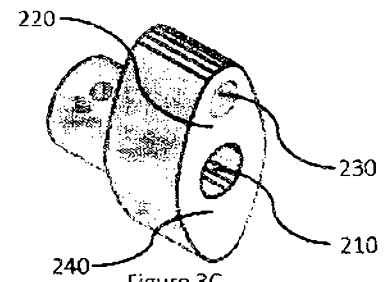


Figure 3C

300

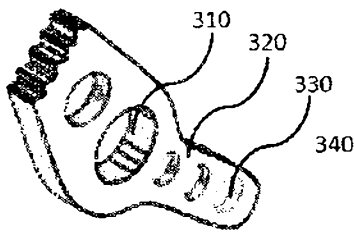


Figure 4A

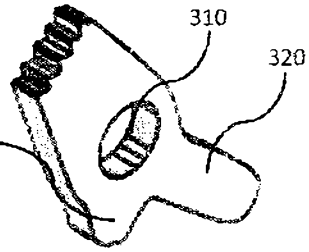


Figure 4B

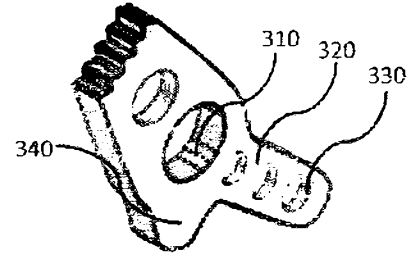
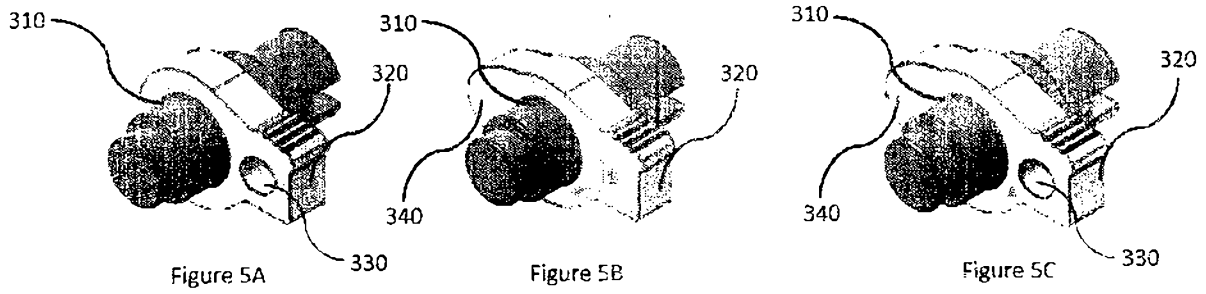
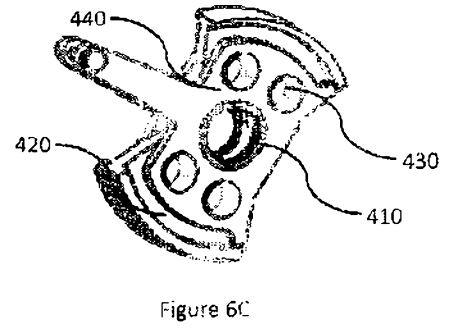
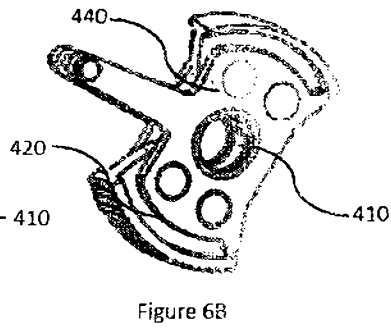
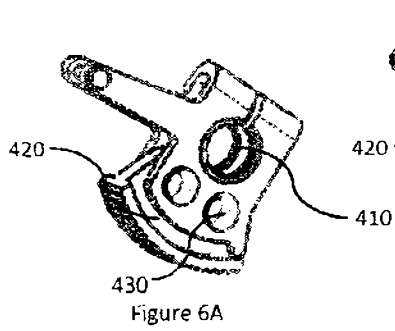


Figure 4C

300



400



400

