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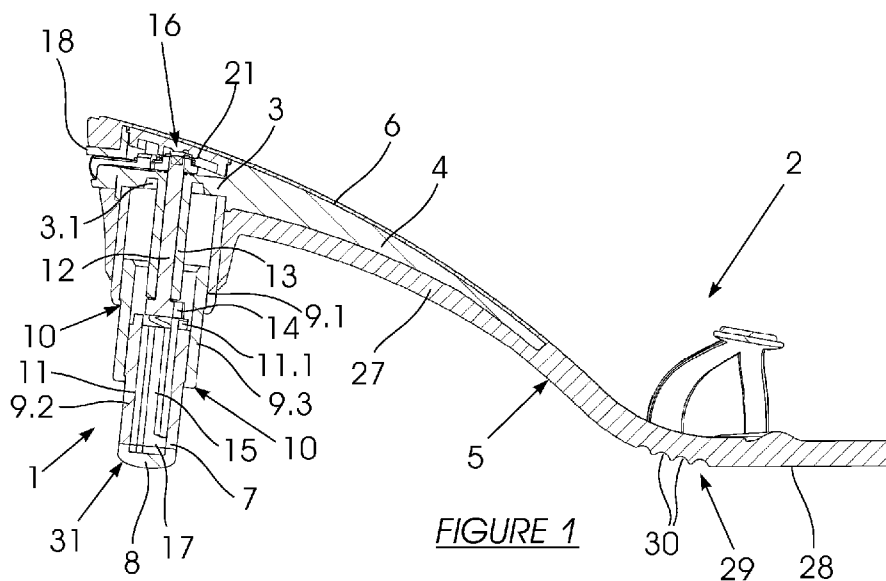
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(54) **Title:** A HEEL FOR A SHOE



(57) **Abstract:** The invention provides a heel for a shoe including a butt-end securable to a shoe and a base providing a heel tip at its free end. The base is movable in relation to the butt-end, with the base and butt-end connected through telescopic components. A cooperating sleeve within the heel is provided with a keyway profiled to fit over a key on the end of a pin when the keyway and key are aligned. The sleeve and pin are configured to hold the heel in a retracted condition when the pin is in the sleeve and to hold the heel in an extended condition when the pin is withdrawn from the sleeve. The invention further provides a mechanism to rotate the pin with its key and the sleeve with its keyway, into alignment to enable movement of the heel between the retracted and extended conditions.

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A HEEL FOR A SHOE

FIELD OF THE INVENTION

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The invention relates to a heel of adjustable height for a shoe; in particular, for a ladies high-heel shoe. The invention extends to a shoe having such a heel.

BACKGROUND TO THE INVENTION

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The state of the art is set out by a variety of heels for ladies shoes of different construction which purport to offer adjustment in height. Despite the many versions disclosed in published documents, the applicant is not aware of any such product which has been particularly well received or gained significant commercial success.

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The heel of a high-heel shoe is subjected to significant forces and wear.

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An adjustable heel would provide the comfort of a shorter, "low heel" in its retracted condition. This is better suited for walking, riding a bicycle and for general daily use, such as standing in queues. In its extended condition, the heel

would provide extra height and other aesthetic appeal associated with high-heel shoes. While the idea of incorporating this feature into a shoe carries these and possibly other advantages, it would seem that a suitable construction for a heel of this type has eluded those who have attempted to do so.

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OBJECT OF THE INVENTION

It is an object of the present invention to provide a heel of adjustable height that is convenient to use and has a construction and features which are suited to serve its purpose.

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SUMMARY OF THE INVENTION

In accordance with the invention there is provided a heel for a shoe including a butt-end securable to a shoe and a base providing a heel tip at its free end, the base movable in relation to the butt-end, with the base and butt-end connected through telescopic components, a cooperating sleeve and pin mounted coaxially within the heel, the sleeve having a keyway profiled to fit over a key on the end of the pin when the keyway and key are aligned and the sleeve and pin configured to hold the heel in a retracted condition when the pin is in the sleeve and to hold the heel in an extended condition when the pin is withdrawn from the sleeve, and a mechanism to rotate the pin with its key and the sleeve with its keyway, into alignment to enable movement of the heel between the retracted and extended conditions.

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The invention further provides for at least one spring between the base and butt-end to bias the heel into the extended condition; and for the spring to be a coil spring guided within the heel.

Further features of the invention provide for the mechanism to include a spring to bias the passage of the sleeve and the key of the pin out of alignment; and for

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the mechanism to include an operating lever with a torsion spring, extending laterally from the pin or sleeve; or an operating rack with a coil spring, which engages a pinion connected to the pin or sleeve.

5 A further feature of the invention provides for a first telescopic component to extend from the butt-end and a second telescopic component to extend from the base, with a third telescopic component received slidably within the first component and extending slidably over the second component.

10 In accordance with another aspect of this invention there is provided a heel for a shoe as defined above wherein the tip of the heel is configured to engage the ground with the heel in the retracted condition and in the extended condition.

The tip will either be provided with a curved ground engaging surface; or with first and second ground engaging surfaces which are provided on the tip at a suitable angle in relation to each other.

In accordance with another aspect of this invention there is provided a shoe including a heel as defined above.

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BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

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Figure 1 shows a cross-sectional side view of a shoe with an adjustable heel in an extended condition with a first embodiment of an operating mechanism;

Figure 2 shows the shoe in Figure 1 with the heel in a retracted condition;

30 Figure 3 shows an exploded perspective view of the components of the heel;

Figure 4 shows a cross-section of the heel in extended condition;

- Figure 5 shows a perspective view of the heel;
Figure 6 shows a cross-section of the heel in retracted condition;
Figure 7 shows an exploded perspective view of the components of a heel with an alternative operating mechanism;
5 Figure 8 shows a cross-section of the heel in Figure 7 in extended condition; and
Figure 9 shows a perspective view of the heel in Figure 7.

DETAILED DESCRIPTION OF THE INVENTION

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Referring to Figures 1 to 6, a first embodiment of a heel (1) for a high-heel shoe (2) is shown. The heel (1) has a butt-end (3) which is secured to the shoe (2). A bridge support (4) extends from the butt-end (3). The support (4) is secured between an outer sole (5) and an inner sole (6) of the shoe (2).

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A base (7) is provided with a heel tip (8) at its free outer end. The base (7) is movable in relation to the butt-end (3), with the base (7) and butt-end (3) connected through telescopic components (9). More specifically, a first telescopic component (9.1) extends downwardly from the butt-end (3) and a second
20 telescopic component (9.2) extends upwardly from the base (7). A third telescopic component (9.3) is received slidably within the first component (9.1) and extends slidably over the second component (9.2). The third telescopic component (9.3) is smaller than the first (9.1) and larger than the second (9.2). Inwardly extending lips (10) on the ends of components (9.1) and (9.3) are
25 provided to limit the extended telescopic relationship of the components (9) by engagement with shoulders projecting from components (9.3) and (9.1).

A cooperating sleeve (11) and pin (12) are provided coaxially within the heel (1). The sleeve (11) is formed in the second component (9.2), which extends from the
30 base (7).

A hollow spigot (13) extends from the butt-end (3) and the pin (12) is positioned for axial rotation within the spigot (13). The pin (12) is a close fit to the inside of the spigot (13). A key (14) extends laterally from the pin (12), at its operatively lower end. In this embodiment, a pair of oppositely extending keys (14) is provided. The keys (14) locate against the free end of the spigot (13) when the pin (12) is in place.

The sleeve (11) provides a longitudinal keyway (15) profiled to fit over the keys (14) on the end of the pin (12) when the keyway (15) and keys (14) are aligned. An operating mechanism (16) to rotate the pin (12), for alignment of the keys (14) with the keyway (15) is provided at the other end of the pin (12), adjacent the butt-end (3).

A chamber (17) is provided in the second component (9.2) at the lower end of the keyway (15). The chamber (17) allows for rotation of the keys (14) out of alignment with the keyway (15), once the keys (14) have passed through and the pin (12) is located inside the keyway (15).

The mechanism (16) includes a lever (18) with an opening (19) provided to fit onto the end of the pin (12), which is provided with a corresponding flat (20). A torsion spring (21) fits over the pin (12) with its ends secured to the lever (18) and to an anchor (22) on the butt-end (3), respectively. The spring (21) serves to bias the pin (12) into a position where the keys (14) are out of alignment with the keyway (15). A circlip (23) holds the components on the end of the pin (12). The lever (18) projects from the rear of the heel (1) at the butt-end (3).

Two oppositely arranged stops (11.1) are provided at the top of the sleeve (11). The keys (14), under influence of the spring (21) biasing the pin (12), come to rest against the stops (11.1) when they are withdrawn from the keyway (15) and the lever (18) is released. When the lever (18) is operated, the keys (14) contact the opposite sides of the stops (11.1) when in alignment with the keyway (15).

The chamber (17) below the keyway (15) is configured to limit movement of the keys (14) in the same manner as the stops (11.1).

5 A pair of coil springs (24) is provided between the base (7) and butt-end (3). The springs (24) are located on prongs (25) extending from butt-end (3) and in cylindrical recesses (26) in the second component (9.2) on the base (7). The prongs (25) and recesses (26) serve as guides for the springs (24).

10 In this embodiment, the second component (9.2) is solid with the sleeve (11) and recesses (26) formed therein. The chamber (17) is provided by the component (9.2) and the heel tip (8) which is fixed to the ground engaging end.

15 The keys (14) lock the heel (1), either located against the operatively upper end of the sleeve (11) when the heel is in an extended condition or at the lower end of the sleeve (11) where they locate in the chamber (17) when the heel (1) is in a retracted condition. The springs (24) bias the heel (1) into an extended condition.

20 Moving the operating lever (18), against the bias of the spring (21) will align the keys (14) with the keyway (15) when the heel (1) is in its retracted condition, and the springs (24) will automatically move the heel (1) into its extended condition (provided a user is not placing any weight on the heel). To adjust the heel (1) from the extended condition into the retracted condition, the lever (18) is again moved against the torsion spring (21) and a slight force applied to the base (7) of the heel (1) to overcome the resistance of the springs (24).

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In the retracted condition, the top of the second component (9.2) abuts the butt-end (3) with the stops (11.1) received in recesses (3.1). Whereas, when the heel (1) is in its extended condition the second component (9.2), keys (14) and spigot (13) bear the load.

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The invention also provides for the combination of the heel (1) and the outer sole (5) as shown in Figures 1 and 2. These components can be supplied to existing shoe manufacturers who will construct and fit them with their own uppers.

5 A bridge portion (27) of the outer sole (5) extends from the heel (1) to a ground engaging portion (28) at the front of the shoe (2). An integral hinge (29) is formed in the outer sole (5) between the bridge portion (27) and ground engaging portion (28). The hinge (29) is preferably provided by transverse grooves (30) formed in the lower surface of the outer sole (5). The result of an integral hinge (29) can
10 also be achieved using materials with greater properties of flexibility than those used for the remainder of the outer sole (5).

The hinge (29) serves to accommodate the change in angle between the bridge portion (27) and ground engaging portion (28) which results from adjustment of
15 the height of the heel (1). The different constructions and materials will be within the design competence of a person suitably skilled in the art.

Also to accommodate this change in angle, the tip (8) of the heel (1) is configured to engage the ground with the heel (1) both in a retracted condition and in an
20 extended condition. To this end, the tip (8) is provided with a curved ground engaging surface (31). As an alternative, the tip (8) may have first and second ground engaging surfaces which are provided at a suitable angle in relation to each other.

25 Referring now to Figures 7 to 9, a heel (100) of essentially the same construction as that already described is fitted with an alternative operating mechanism (102).

In this embodiment, a pinion (103) is secured to the pin (104). A pair of cooperating racks (105) is provided, one on either side of the pinion (103). The
30 racks (105) extend from operating press-buttons (106) which project on each side of the heel (100) at the butt-end (107). The buttons (106) are biased outwardly by

coil springs (108). Like the torsion spring (21) of the first embodiment, these springs (108) bias the keys (109) out of alignment with the keyway (110). It will be understood that by pressing the buttons (106) inwardly, the heel (100) can similarly be adjusted between its extended and retracted condition.

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In a preferred embodiment of the invention, the heel (1) will be provided with the butt-end (3) moulded as an integral part on the underside of a shoe sole. In this case, the entire sole replaces the bridge support (4).

10 As an alternative, the sleeve with its keyway may be rotatable through an operating mechanism to cooperate as required with a pin and key that are fixed in the heel. In this case, the pin can be mounted below the sleeve which will be movably connected to the butt-end.

15 A person skilled in the art will appreciate that a number of variations may be made to the features of the embodiments described without departing from the scope of the present invention.

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CLAIMS

1. A heel for a shoe including a butt-end securable to a shoe and a base
5 providing a heel tip at its free end, the base movable in relation to the butt-
end, with the base and butt-end connected through telescopic
components, a cooperating sleeve and pin mounted coaxially within the
heel, the sleeve having a keyway profiled to fit over a key on the end of
10 the pin when the keyway and key are aligned and the sleeve and pin
configured to hold the heel in a retracted condition when the pin is in the
sleeve and to hold the heel in an extended condition when the pin is
withdrawn from the sleeve, and a mechanism to rotate the pin with its key
and the sleeve with its keyway, into alignment to enable movement of the
15 heel between the retracted and extended conditions.
2. A heel as claimed in claim 1 which includes at least one spring between
the base and butt-end to bias the heel into the extended condition.
3. A heel as claimed in claim 2 in which the spring is a coil spring guided
20 within the heel.
4. A heel as claimed in any one of claims 1 to 3 in which the mechanism
includes a spring to bias the passage of the sleeve and the key of the pin
out of alignment.
- 25 5. A heel as claimed in claim 4 in which the mechanism further includes an
operating lever with a torsion spring, extending laterally from the pin or
sleeve.
- 30 6. A heel as claimed in claim 4 in which the mechanism includes an
operating rack with a coil spring, which engages a pinion connected to the
pin or sleeve.

7. A heel as claimed in any one of the preceding claims including a first telescopic component to extend from the butt-end and a second telescopic component to extend from the base, with a third telescopic component received slidably within the first component and extending slidably over
5 the second component.

8. A heel for a shoe as claimed in any one of the preceding claims in which the tip of the heel is configured to engage the ground with the heel in the retracted condition and in the extended condition.
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9. A heel as claimed in claim 8 in which the tip is provided with a curved ground engaging surface.

10. A heel as claimed in claim 8 in which the tip is provided or with first and
15 second ground engaging surfaces which are provided on the tip at a suitable angle in relation to each other.

11. A shoe including a heel as claimed in any one of the preceding claims.
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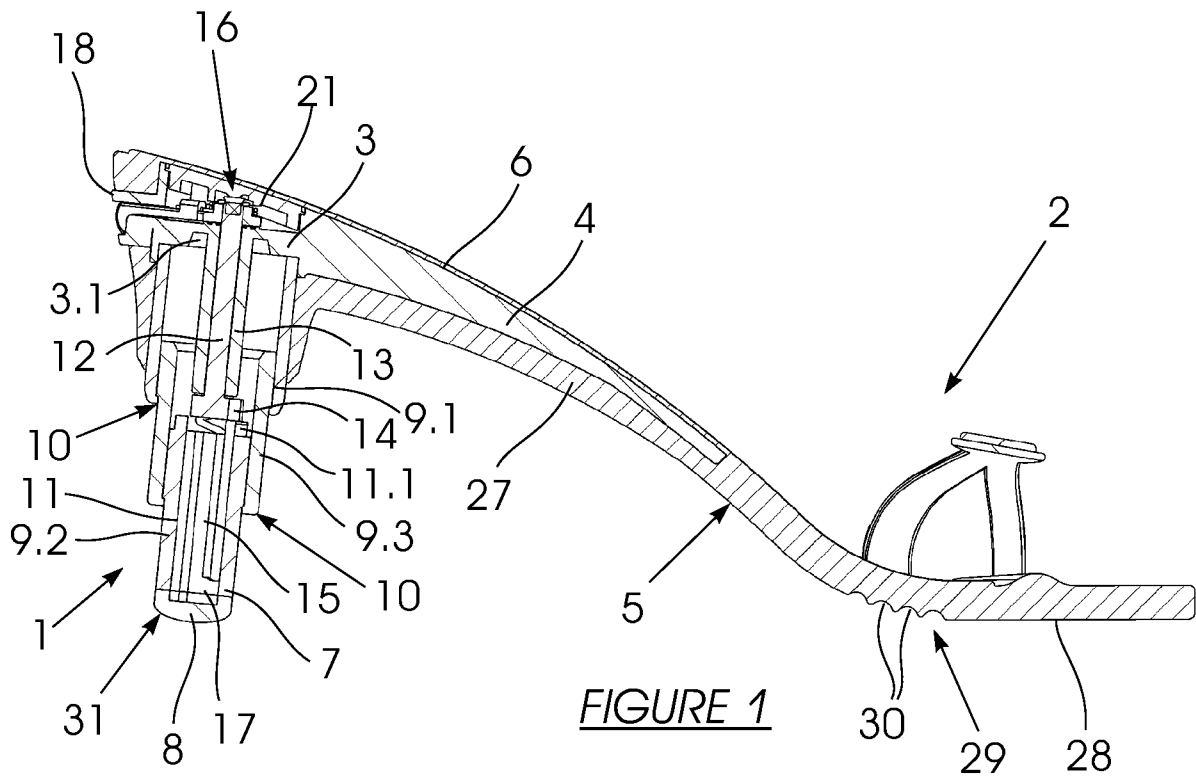


FIGURE 1

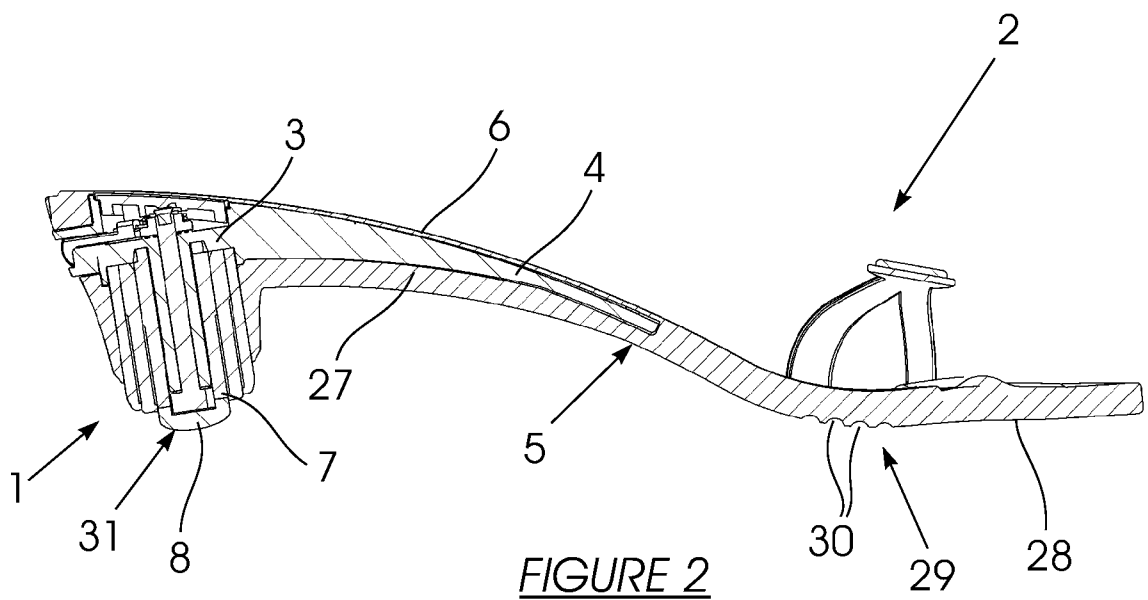


FIGURE 2

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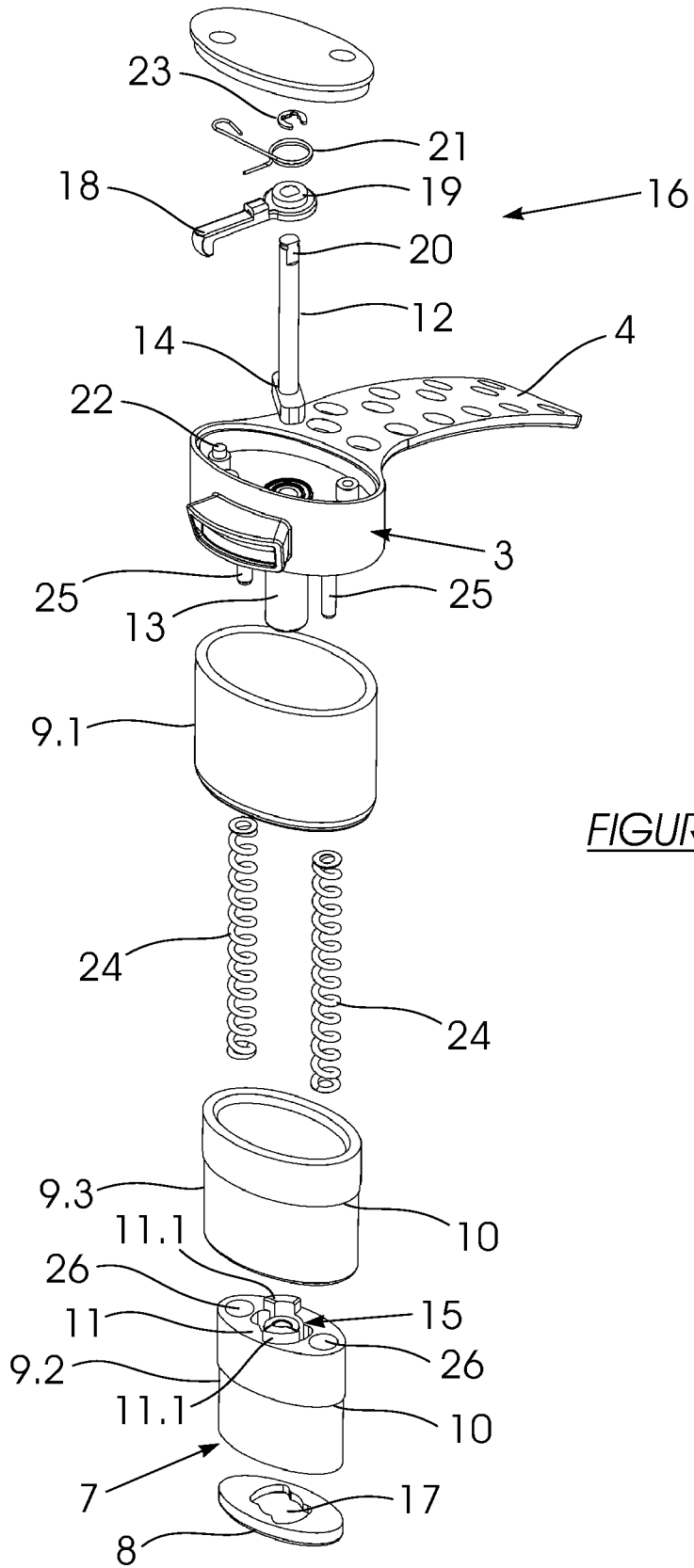


FIGURE 3

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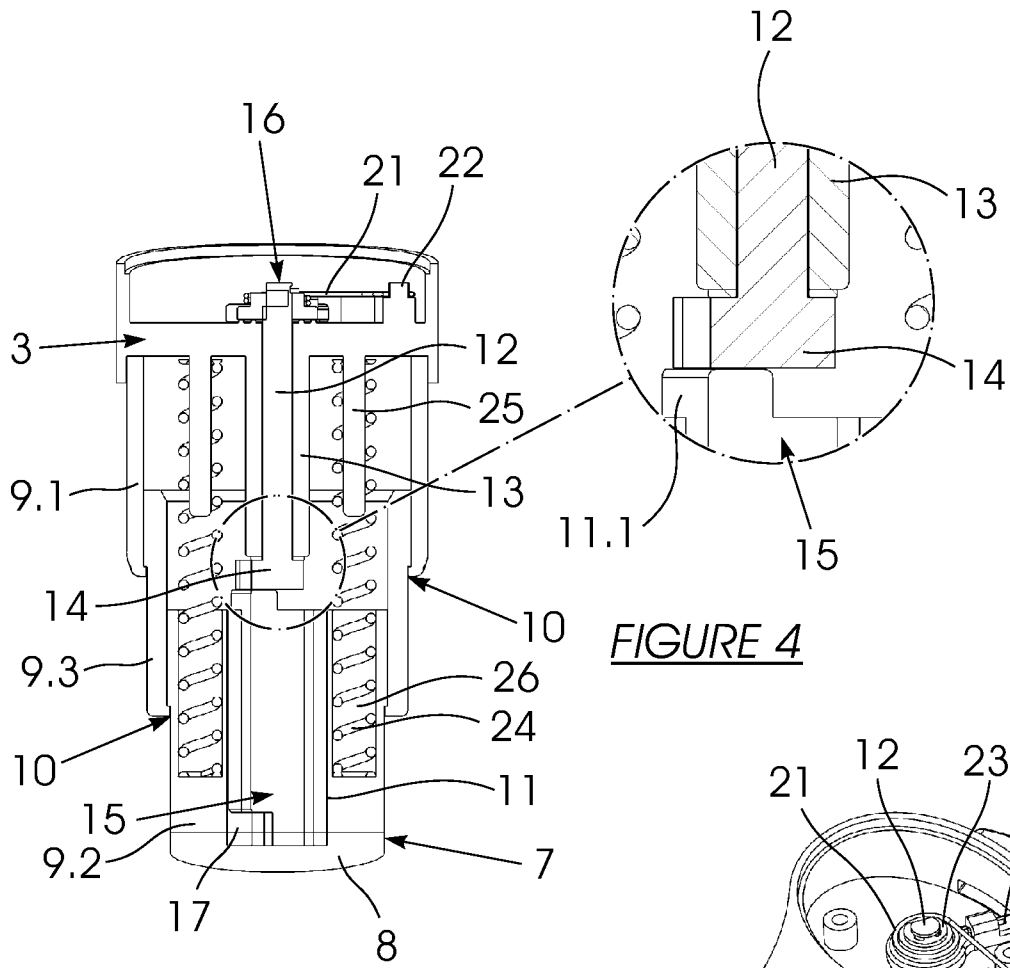


FIGURE 4

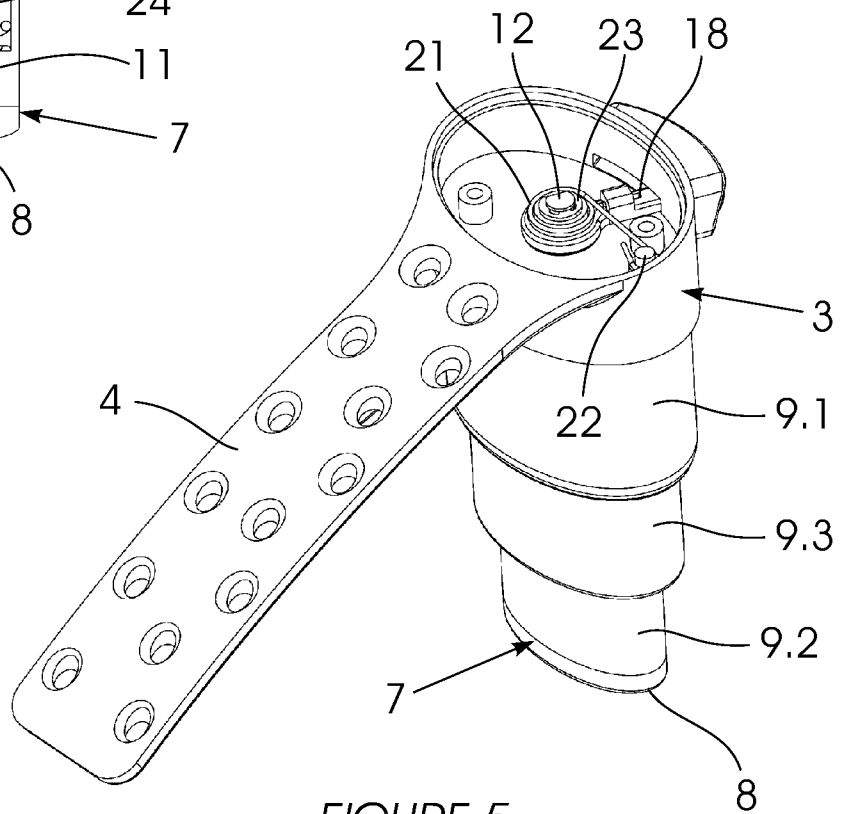
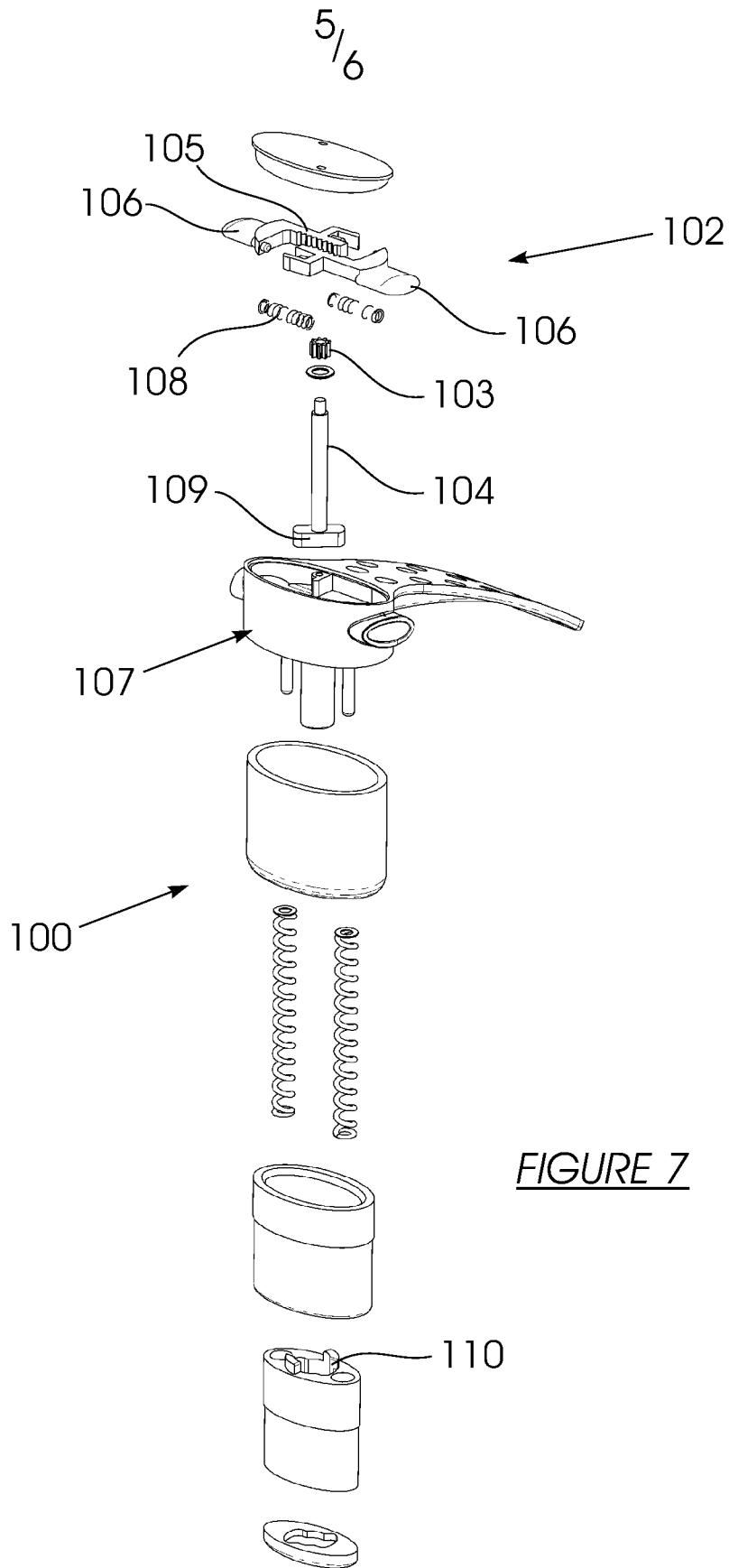


FIGURE 5



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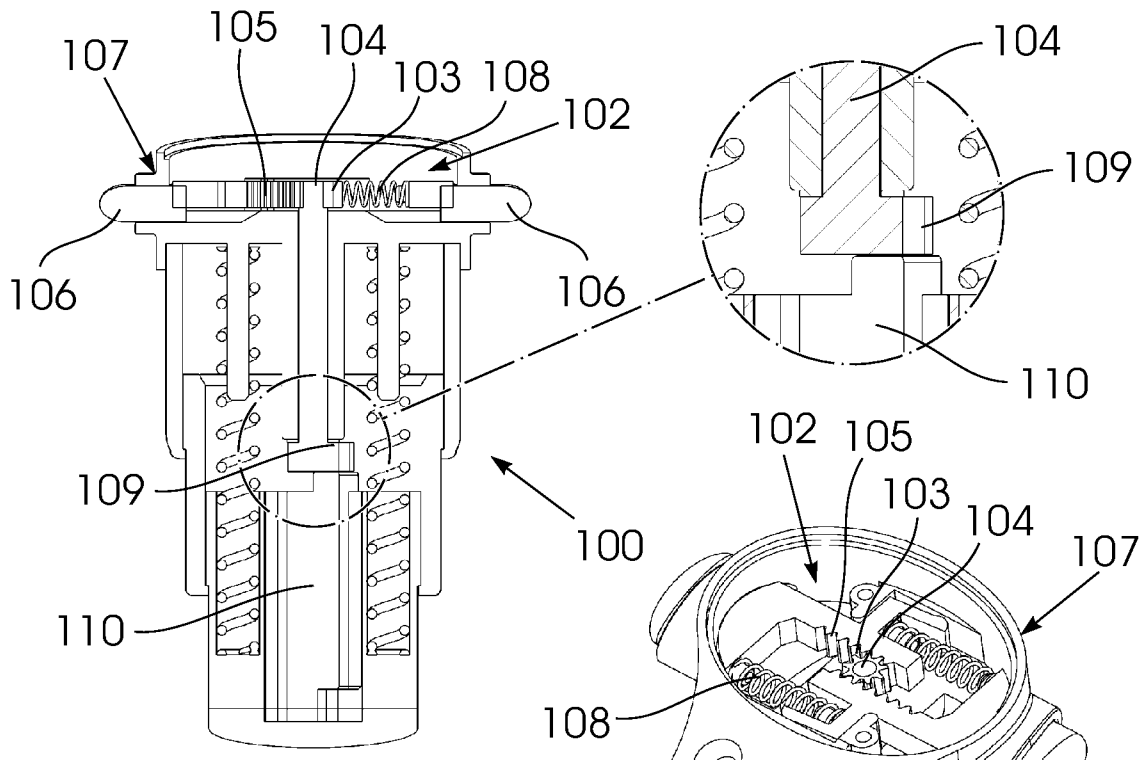


FIGURE 8

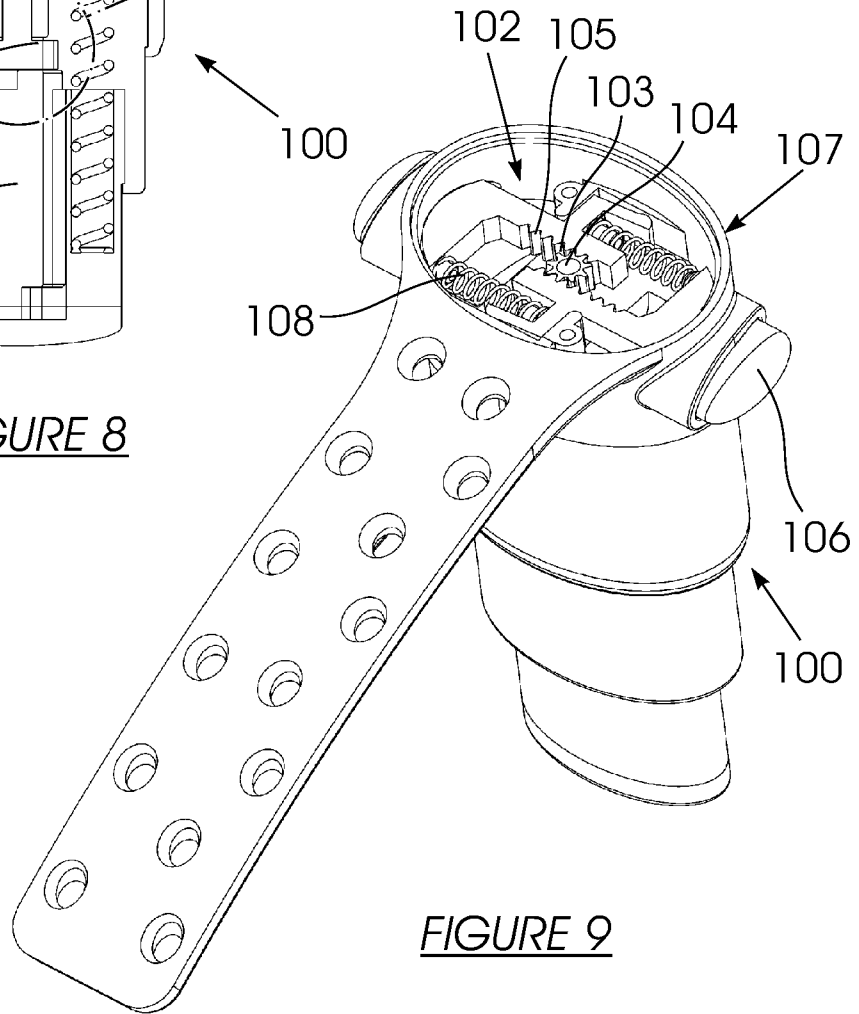


FIGURE 9