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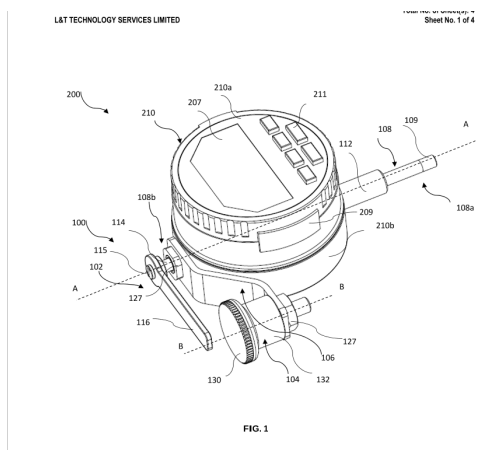
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(54) Title: A LOCK MECHANISM FOR A DIGITAL DIAL INDICATOR

(57) Abstract: Present disclosure relates to a lock mechanism (100) for a digital dial indicator (200). The mechanism comprises a plunger (108) movably disposed in a housing (210) and displaceable from a first position to a second position. A contact portion (109) is attached to a first end of the plunger. A handle (102) is fixedly attached to a second end of the plunger. The handle is configured to displace the plunger between the first position and the second position. At least one bracket (106) is attached to the plunger (108) proximate to the handle. An index plunger (104) is fixedly attached to the at least one bracket. The index plunger is configured to selectively actuate the handle and arrest a movement of the plunger in the second position. The mechanism retracts the and holds the plunger in place to protect the plunger from breakage.



FORM 2

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Complete Specification

(See Section 10 and Rule 13)

1. TITLE OF THE INVENTION

A LOCK MECHANISM FOR A DIGITAL DIAL INDICATOR

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification describes the invention and the manner in which it is to be performed

DESCRIPTION

TECHNICAL FIELD

5 [0001] Present disclosure relates to a field of metrology. Particularly, but not exclusively the present disclosure relates to a digital dial measurement indicator that includes a lock mechanism.

BACKGROUND

10 [0002] A dial indicator is a precision measuring tool that is generally used for linear measurement. Typically, the dial indicator comprises a dial including a measurement scale and a pointer disposed in a dial for indicating the measurement. A plunger having a contact portion at one end is disposed within the dial and an actuating mechanism is connected to plunger. The plunger is contacted against a work piece and the displacement of the plunger is recorded to measure a value. In digital indicators, the measurement scale and the pointer may be replaced with a digital display for indicating the measurement values.

15 [0003] Conventionally, during inspection process, machined parts are continuously measured for required tolerances using the dial indicators. The contact portion will be at a zero position before it is actuated towards a surface of the machined part for measurement. However, due to quick loading and unloading of the machined parts in a measurement setup/fixture, the machined parts with high tolerances may hit the contact portion with high force which may break out the contact portion of the plunger. To overcome this, the plunger is initially retracted backwards by one person and another person will load the part into the fixture for measurement. This process of measuring is labor intensive and increases the idle time which reduces the productivity of inspection process.

25 [0004] The present disclosure is directed to overcome one or more limitations stated above or any other limitations associated with the prior art. The information disclosed in this background of the disclosure section is only for enhancement of understanding of the general background of the invention and should not be taken as an acknowledgement or any form of suggestion that
30 this information forms the prior art already known to a person skilled in the art.

SUMMARY OF THE INVENTION

5 [0005] One or more shortcomings of existing dial indicators have been overcome, and additional advantages are provided through the mechanism as claimed in the present disclosure. Additional features and advantages are realized through the techniques of the present disclosure. Other embodiments and aspects of the disclosure are described in detail herein and are considered a part of the claimed disclosure.

10 [0006] The limitations of the prior arts are addressed by a lock mechanism for a digital dial indicator as disclosed in the present disclosure. The lock mechanism comprises a plunger movably disposed in a housing and capable of being displaced from a first position to a second position. The plunger is defined with a first end and a second end opposite to the first end. A contact point is attached to the first end of the plunger. A handle is fixedly attached to the second end of the plunger. The handle is configured to displace the plunger between the first position and the second position. At least one bracket is attached to the second end of the plunger proximate to the handle. An index plunger is fixedly attached to the at least one bracket. The index plunger is configured to selectively actuate the handle and arrest a movement of the plunger in the second position.

20 [0007] In an embodiment of the present disclosure, the plunger is coupled with an actuator disposed within the housing. The actuator is configured to displace the plunger from the first position to the second position along an axis upon actuation of the handle and retract the plunger from the second position to the first position upon releasing the handle.

25 [0008] In an embodiment, the lock mechanism comprises a stem connected to the housing. The stem is configured to receive the plunger therewithin and support displacement of the plunger.

30 [0009] In an embodiment, the at least one bracket extends in a traverse direction of the plunger and is positioned parallel to the handle such that the index plunger which is connected to the at least one bracket is engageable with the handle. In an embodiment, the at least one bracket is angled at a central portion based on a length of the index plunger and the displacement of the plunger in the second position.

[0010] In an embodiment, the index plunger is positioned along an axis at an offset from the plunger. The index plunger is configured to disengage from the handle in the first position and engages the handle in the second position to displace the plunger along the axis.

5 [0011] In an embodiment, the handle comprises a threaded portion to receive and fasten to the other end of the plunger and a flat portion extending perpendicular to the threaded portion.

10 [0012] In an embodiment, the actuator comprises a block disposed at a central portion of the housing. A slider is movably disposed within the block such that the slider is connected to the block at one end and to the plunger at an other end. A resilient member is attached to the slider and the plunger. The resilient member is configured to bias the plunger in at least one of the first position and the second position. Further, a rack is defined proximate to the second end of the plunger. A pinion is engageable with the rack to displace the plunger along the axis.

15 [0013] In an embodiment, the index plunger comprises a body defined with a knob at one end and an opening within the body such that the knob is rotatable about the axis. A base disposed within the opening of the body. Further, a spring is mounted between the base and the body. The spring is configured to bias the body in at least one of the first position and the second position upon actuating the knob.

20 [0014] It is to be understood that the aspects and embodiments of the disclosure described above may be used in any combination with each other. Several of the aspects and embodiments may be combined to form a further embodiment of the disclosure.

25 [0015] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects and features described above, further aspects and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

30 [0016] The novel features and characteristic of the disclosure are set forth in the appended claims. The disclosure itself, however, as well as a mode of use, further objectives, and advantages thereof, will best be understood by reference to the following detailed description of

an embodiment when read in conjunction with reference to the accompanying drawings wherein like reference numerals represent like elements and in which:

[0017] FIG. 1 illustrates a perspective view of a digital dial indicator with a lock mechanism in accordance with an embodiment of the present disclosure.

5 [0018] FIG. 2 illustrates an exploded view of the lock mechanism for the digital dial indicator in accordance with an embodiment of the present disclosure.

[0019] FIG. 3 illustrates a top view of an actuator for displacement of the plunger, in accordance with an embodiment of the present disclosure.

10 [0020] FIG. 4a illustrates an exploded view of an index plunger in accordance with an embodiment of the present disclosure.

[0021] FIG 4b illustrates a sectional front view of the index plunger, in accordance with an embodiment of the present disclosure.

[0022] FIG(s). 5a & 5b illustrate a front view of a portion of the index plunger in a retracted and released position, in accordance with another embodiment of the present disclosure.

15 [0023] The figures depict embodiments of the disclosure for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the mechanism and device illustrated herein may be employed without departing from the objective of the disclosure described herein. It should be appreciated by those skilled in the art that any block diagrams herein represent conceptual views of illustrative mechanisms embodying the principles of the present subject matter.

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DETAILED DESCRIPTION OF THE DRAWINGS

[0024] The foregoing has broadly outlined the features and technical advantages of the present disclosure in order that the detailed description of the disclosure that follows may be better understood. Additional features and advantages of the disclosure will be described hereinafter which forms the subject of the claims of the disclosure. It should be appreciated by those skilled in the art that, the conception and specific embodiments disclosed may be readily utilized as a basis for modifying other devices, assemblies, and mechanisms for carrying out the same purposes of the present disclosure. It should also be realized by those skilled in the art that, such equivalent constructions do not depart from the scope of the disclosure as set forth in the appended claims. The novel features which are believed to be characteristics of the disclosure, to

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its mechanism, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present disclosure.

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[0025] In accordance with various embodiments of the present disclosure, a lock mechanism for a digital dial indicator may be described. The lock mechanism comprises a plunger movably disposed in a housing and capable of being displaced from a first position to a second position. The plunger is defined with a first end and a second end opposite to the first end. A contact point is attached to the first end of the plunger and a handle is fixedly attached to the second end of the plunger. The handle is configured to displace the plunger between the first position and the second position. At least one bracket is attached to the second end of the plunger proximate to the handle. An index plunger is fixedly attached to the at least one bracket. The index plunger is configured to selectively actuate the handle and arrest a movement of the plunger in the second position.

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[0026] In an embodiment, the lock mechanism of the configuration described above enables to retract the plunger to a desired position and holds the plunger in place. This prevents the plunger from contacting a measuring surface having high tolerances and thereby protects the plunger from breakage. This improves reliability of the digital dial indicator and reduces maintenance and replacement costs of the device. Further, the process of inspection or measurement can be carried out quickly with the lock mechanism which improves productivity.

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[0027] While the embodiments in the disclosure are subject to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the figures and will be described below. It should be understood, however, that it is not intended to limit the disclosure to the particular forms disclosed, but on the contrary, the disclosure is to cover all modifications, equivalents, and alternative falling within the scope of the disclosure.

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[0028] It is to be noted that a person skilled in the art would be motivated from the present disclosure and modify construction of a digital dial indicator to incorporate a lock mechanism. However, such modifications should be construed within the scope of the present disclosure. Accordingly, the drawings show only those specific details that are pertinent to understand the

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embodiments of the present disclosure, so as not to obscure the disclosure with details that will be readily apparent to those of ordinary skill in the art having benefit of the description herein.

[0029] The terms “comprise,” “comprising”, or any other variations thereof used in the disclosure, are intended to cover a non-exclusive inclusion, such that a mechanism and a device that comprises a list of components does not include only those components but may include other components not expressly listed or inherent to such mechanism or device. In other words, one or more elements in the mechanism proceeded by “comprises... a” does not, without more constraints, preclude the existence of other elements or additional elements in the mechanism or device.

[0030] The following paragraphs describe the present disclosure with reference to FIG(s) 1 to 5b. In the figures, the same element or elements which have similar functions are indicated by the same reference signs. With general reference to the drawings, a lock mechanism (100) for a digital dial indicator (200) in accordance with the teachings of a preferred embodiment of the present disclosure is illustrated and generally identified at reference numeral 100. The lock mechanism (100) may be operated by a worker or a technician for measuring tolerances of machined parts. It will be understood that the teachings of the present disclosure are not limited to any particular digital dial indicator (200) and may be used in any conventional dial indicator.

[0031] The following detailed description is merely exemplary in nature and is not intended to limit application and uses. Furthermore, there is no intention to be bound by any theory presented in the preceding background or summary or the following detailed description. It is to be understood that the disclosure may assume various alternative orientations and step sequences, except where expressly specified to the contrary. It is also to be understood that the specific devices or components illustrated in the attached drawings and described in the following specification are simply exemplary embodiments of the inventive concepts defined in the appended claims. Hence, specific dimensions or other physical characteristics relating to the embodiments that may be disclosed are not to be considered as limiting, unless the claims expressly state otherwise. Hereinafter, preferred embodiments of the present disclosure will be described referring to the accompanying drawings. While some specific terms of “upper”, “lower”, “below”, “above”, “right”, “left”, “rear” or “front” and other terms containing these specific terms and directed to a specific direction will be used, the purpose of usage of these terms or words is merely to facilitate understanding of the present invention referring to the

drawings. Accordingly, it should be noted that the meanings of these terms or words should not improperly limit the technical scope of the present invention.

[0032] Also, it is to be understood that the phraseology and terminology used herein is for description and should not be regarded as limiting. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings. It is to be understood that this disclosure is not limited to the specific devices, mechanisms, applications, conditions, or parameters described and/or shown herein and that the terminology used herein is to describe particular embodiments by way of example and is not intended to be limiting of the claimed invention. Hereinafter in the following description, various embodiments will be described. For purposes of explanation, specific configurations and details are outlined to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the embodiments may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

[0033] Referring to FIG(s) 1 to 5b in conjunction, which illustrates the lock mechanism (100) [hereinafter referred to as mechanism (100)] for a digital dial indicator (200) [hereinafter referred to as the indicator (200)] and various components associated with the mechanism (100). Hereinafter, features of the lock mechanism (100) along with its working may be elucidated.

[0034] Referring to FIG(s). 1 and 2, the indicator (200) among other components may include a housing (210) including a top cover (210a) and a base (210b) connected to the top cover (210a). A display (207) is mounted on the top cover (210a) to digitally record and indicate the measured values. In an embodiment, the display (207) may be a standard LCD display or any other suitable display. A plurality of buttons (211) is movably disposed on the top cover (210a) below the display to operate the indicator (200). A slotted provision (209) is defined at a centre portion of the indicator (200) to receive a battery for powering the indicator (200). In an embodiment, the provision (209) may be a slot having an enclosure which is slidable with respect to the housing (210). Further the base (210b) of the housing (210) is configured to accommodate a lock mechanism (100). In an embodiment, the top cover (210a) and the base (210b) are configured in a cylindrical shape and however this cannot be construed as a limitation and the top

cover (210a) and the base (210b) may be structured in a square, rectangle or any polygonal shape. In an embodiment, the housing (210) is manufactured of a polymeric material.

[0035] As shown in FIG. 1, the mechanism (100) comprises a plunger (108) movably disposed in the base (210b) of the housing (210). The base (210b) is defined with a through hole (not shown in figs.) to receive the plunger (108). The plunger (108) is movably disposed within the housing (210) along an axis (A-A) and is configured to displace from a first position to a second position. The plunger (108) is defined with a first end (108a) and a second end (108b) opposite to the first end (108a). A portion of the plunger (108) is defined with a rack (126) (as shown in FIG 3) at the second end (108b) of the plunger (108). The second end (108b) of the plunger (108) extends across the base (210b) and located outside the housing (210). In an embodiment, the plunger (108) may be made of stainless steel and any other suitable material which serves the purpose. In an embodiment, the plunger (108) may be hollow in configuration. Further, a stem (112) is connected to the housing (210) at one end to receive the plunger (108). A sleeve (113) is connected to the housing (210) at another end opposite to the stem (112). In an embodiment, the plunger (108) reciprocates within the stem (112) and the sleeve (113) such that the first end (108a) and the second end (108b) of the plunger (108) are positioned outside the housing (210). In other words, the stem (112) and the sleeve (113) prevents the plunger (108) from entirely retracting into the housing (210). The stem (112) is structured in a cylindrical shape and is manufactured of softer metallic material or polymers to reduce the friction at the contact surface of the plunger (108) during its reciprocation along the axis (A-A).

[0036] The mechanism (100) further comprises a contact portion (109) attached to the first end (108a) of the plunger (108). The contact portion (109) is configured to contact a surface of a part to be measured. In an embodiment, the contact portion (109) may be made of hard metallic material compared to that of the plunger (108). In an embodiment, the contact portion (109) may be removably attached to the first end (108a) of the plunger (108). In an embodiment, the contact portion (109) may be attached to the plunger (108) by way of threaded fastening or screwing.

[0037] Referring back to FIG. 1, a handle (102) is fixedly attached to the second end (108b) of the plunger (108). The handle (102) is defined with a threaded portion (114) and a flat portion (116) extending perpendicular to the threaded portion (114). The threaded portion (114) is configured to fasten with the second end (108b) of the plunger (108). The threaded portion (114)

comprises a body (114a) having internal threads (not shown in FIG(s)) and a shaft portion (114b) receivable within the second end (108b) of the plunger (108). The flat portion (116) is defined with a hole (115a) defined at one end. The hole (115a) is aligned with the threaded portion (114) such that the handle (102) is connected to the plunger (108) by fastening a screw (115) within the hole (115a) and the threaded portion (114). The handle (102) is configured to displace the plunger (108) between the first position and the second position.

[0038] Still referring to FIG. 2, the lock mechanism (100) further comprises at least one bracket (106) attached to the second end of the plunger (108) proximate to the handle (102). The at least one bracket (106) is defined with a first portion (106a) and a second portion (106b) that are flat in configuration and are parallel to each other. The first portion (106a) and the second portion (106b) are connected by a central portion (107). The central portion (107) is angled such that the first portion (106a) and the second portion (106b) are positioned in different planes parallel to each other. In an embodiment, the angle of the central portion (107) based on a length of the index plunger (104) and the displacement of the plunger (108) in the second position. The first portion (106a) is defined with a provision (103) to receive the sleeve (113) such that the at least one bracket (106) is mounted on the sleeve (113). The first portion (106a) is positioned at the second end (108b) of the plunger (108). A locknut (127) is configured to fix the at least one bracket (106) in position. The locknut (127) is actuated to tighten or loosen the at least one bracket (106) for removing the at least one bracket (106) from the lock mechanism (100). The at least one bracket (106) extends in a traverse direction of the plunger (108), such that the second portion (106b) is positioned parallel to the flat portion (116) of handle (102). The second portion (106b) of the at least one bracket (106) is also defined with a provision (103) to receive and fasten an index plunger (104).

[0039] Now referring to FIG. 3, an actuator (120) is connected to the plunger (108) for reciprocating the plunger (108) between the first position and the second position. The actuator (120) comprises a block (122) disposed at a central portion of the housing (210). In an embodiment, the block (122) may be positioned at any portion with the housing (210). The block (122) may include a slot (not shown in FIGS.) defined in a longitudinal direction of the block (122) along the axis (A-A). A slider (124) is movably disposed within the block (122). The slider (124) is movably connected to the block (122) at one end and is configured to slidably displace within the block (122). The slider (124) is fixedly connected to the plunger (108) at an other end. A

resilient member (125) is attached to the slider (124) and the plunger (108). The resilient member (125) is configured to bias the plunger (108) in at least one of the first position and the second position upon reciprocation of the plunger (108). In an embodiment, the resilient member (125) may be a spring or any flexible elastic member which serves the purpose. Further, the rack (126) which is defined proximate to the second end (108b) of the plunger (108) is connected to the actuator (120). A pinion (128) is engageable with the rack (126) to displace the plunger (108) along the axis (A-A). The rotational movement of the rack (126) is converted into reciprocation of the plunger (108). The plunger (108) along with the slider (124) is actuated from the first position to the second position. The slider (124) is at a top end of the block (122) in the first position and the resilient member (125) is in expanded or released state. The slider (124) is displaced to a bottom end of the block (122) in the second position and the resilient member (125) will be in a compressed state. The resilient member (125) stores the energy in the compressed state and retracts a contact portion (109) from the second position to the first position upon releasing the force on the plunger (108).

[0040] With reference to FIG(s). 4a and 4b, the index plunger (104) is fixedly attached to the second portion (106b) of the at least one bracket (106) by the locknut (127). The index plunger (104) is movably disposed along an axis (B-B) (as shown in FIG. 1). The index plunger (104) is defined with a body (132) and a base (134). The body (132) is defined with a knob (130) at one end. The knob (130) is rotatable along with the body (132) about the axis (B-B) offset from the axis (A-A) and is parallel to the axis (A-A). In an embodiment, the body (132) is structured in a hollow cylindrical shape. An opening (133) is defined within the body (132) to receive the base (134). The body (132) is defined with a plurality of internal slots (140). Each internal slot of the plurality of internal slots (140) is angularly spaced apart at 30° from each other. A pin (137) is connected to the knob at one end and extends away from the body (132). In an embodiment, the pin (137) is integrated to the body (132) such that the body (132) is structured in a T-shaped configuration and the base (134) being disposed around the pin (137). The base (134) is fixedly disposed within the opening of the body (132) such that the body (132) is movable along the axis (B-B) on the base (134). The base (134) is defined with a collar (135) (as shown in Fig. 4a) at a middle portion of the base (134). In an embodiment the collar (135) is defined with an outer surface that is structured in a hexagonal shape. A shoulder portion (135a) is defined on either ends of the collar (135) to retain the body (132) in position on the base (134).

The shoulder portion (135a) is defined with a plurality of projections (135b) extending from the outer surface of the base (134). The plurality of projections (135b) of the collar (135) are receivable within the plurality of internal slots (140) to lock the body (132) with the base (134). Further, the base (134) is defined with a central provision (139) to receive the pin (137). A spring (136) is mounted between the base (134) and the pin (137). The spring (136) is configured to bias the body (132) in at least one of a released position and a retracted position upon actuating the knob (130).

[0041] With reference to Figs. 5a and 5b, different positions of the index plunger (104) are illustrated. The index plunger (104) is actuated from the released position to the retracted position. In the released position (as shown in Fig. 5b), the pin (137) protrudes from the base (134) and the body (132) covers the collar (135) of the base (134). There is no contact between the knob (130) and the flat portion (116) of the handle (102) in the released position. For actuating the knob (130) to the retracted position (as shown in FIG. 5a), the knob (130) is pulled backwards to a required distance such that the body (132) slides on the base (134) and the pin (137) is housed or covered within the base (134). Consequently, the knob (130) actuates the handle (102) to displace the plunger (108) to the second position. At this position, the spring (136) is compressed by the pin (137) and stores energy. Subsequently, the knob (130) is rotated in a clock wise direction about its axis by 30° such that the plurality of internal slots (140) engage with the plurality of projections (135b). This locks the movement of the body (132) and the body (132) is retained on the collar (135) of the base (134), such that the index plunger (104) is in the retracted position (as shown in Fig. 5a). Subsequently, to release the index plunger (104), the knob (130) is turned counter-clockwise by 30° such that the plurality of internal slots (140) disengage from the plurality of projections (135b) of the collar (135) and the index plunger (104) is actuated back to the released position due to a biasing force of the spring (136). In the released position, the knob (130) releases or disengages from the handle (102) such that the plunger (108) returns to the first position.

[0042] The operative configuration of the mechanism (100) is now explained with reference to FIG. 1. Initially, the indicator (200) will be set-up before loading a work piece in a fixture for starting an inspection process or for measuring the tolerance of the work piece. The indicator (200) is fixed at a distance from the workpiece such that the plunger (108) is brought into contact with a surface of the workpiece. The position at which the plunger (108) comes into contact

with the surface is considered as a zero position which is recorded in the indicator (200). In an embodiment, the zero position may be given to the indicator (200) by pressing at least one button of the plurality of buttons (211) on the top cover (210a). The workpiece or the indicator (200) are moved relative to each other to measure required values such as tolerance, variation in length, radius etc. After measuring, the index plunger (104) is actuated by pulling the knob (130) and rotating it in a clockwise direction to hold the index plunger (104) in place. Upon actuation of the knob (130), the body (132) slides backward on the base such that the index plunger (104) is in the retracted position (as shown in 5a). During the release of the index plunger (104) about the axis (B-B), the flat portion (116) of the handle (102) is also actuated such that, the plunger (108) is retracted and gets into the second position. The knob (130) holds the handle (102) such that the plunger (108) remains in the second position until the next workpiece is loaded for measurement. In other words, the contact portion (109) is away from the surface of the workpiece to prevent it from damage by contacting with the workpiece during loading. Now, after the next work piece is loaded, the index plunger (104) is actuated to the released position. The knob (130) is pressed and rotated counter-clockwise for locking the body (132) with the base (134) such that the index plunger (104) gets into the released position. After concluding the inspecting process, the index plunger (104) is again actuated to the retracted position to load next workpiece. This operation is continued until the inspection process is complete.

[0043] In an embodiment, various types of index plungers may be used such as a pneumatic plunger, a sensor plunger, a remote plunger to automate the operation of selective actuation of the handle (102) and arrest a movement of the plunger (108) in the second position.

[0044] In an embodiment, the lock mechanism (100) of the present disclosure can be incorporated in conventional dial indicators for retracting the plunger (108) and holding it in place to conduct inspection process.

[0045] In an embodiment, the lock mechanism (100) of the present disclosure is compact with less number of parts. Further, the components are easily replaceable which reduces the time for maintenance.

[0046] It is to be understood that a person of ordinary skill in the art may develop a mechanism and a device of similar configuration without deviating from the scope of the present disclosure. Such modifications and variations may be made without departing from the scope of the present disclosure. Therefore, it is intended that the present disclosure covers such modifications and variations provided they come within the ambit of the appended claims and their equivalents.

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WE CLAIM:

1. A lock mechanism (100) for a digital dial indicator (200), the mechanism (100) comprising:
 - a plunger (108) movably disposed in a housing (210) and capable of being displaced from a first position to a second position, the plunger (108) defined with a first end and a second end opposite to the first end;
 - a contact portion (109) attached to the first end (108a) of the plunger (108);
 - a handle (102) fixedly attached to the second end (108b) of the plunger (108), wherein the handle (102) is configured to displace the plunger (108) between the first position and the second position;
 - at least one bracket (106) attached to the second end (108b) of the plunger (108) proximate to the handle (102), and
 - an index plunger (104) fixedly attached to the at least one bracket (106), wherein the index plunger (104) is configured to selectively actuate the handle (102) and arrest a movement of the plunger (108) in the second position.
2. The lock mechanism (100) as claimed in claim 1, wherein the plunger (108) is coupled with an actuator (120) disposed within the housing (210), the actuator (120) is configured to displace the plunger (108) from the first position to the second position along an axis (A-A) upon actuation of the handle (102) and retract the plunger (108) from the second position to the first position upon releasing the handle (102).
3. The lock mechanism (100) as claimed in claim 1 comprises a stem (112) connected to the housing (210), wherein the stem (112) is configured to receive the plunger (108) therewithin and support displacement of the plunger (108).
4. The lock mechanism (100) as claimed in claim 1, wherein the at least one bracket (106) extends in a traverse direction of the plunger (108) and positioned parallel to the handle (102) such that the index plunger (104) connected to the at least one bracket (106) is engageable with the handle (102).

5. The lock mechanism (100) as claimed in claim 4, wherein the at least one bracket (106) is angled at a central portion based on a length of the index plunger (104) and displacement of the plunger (108) in the second position.
6. The lock mechanism (100) as claimed in claim 4, wherein the index plunger (104) is positioned along an axis (B-B) at an offset from the plunger (108).
7. The lock mechanism (100) as claimed in claim 6, wherein the index plunger (104) disengages from the handle (102) in the first position and engages the handle (102) in the second position to displace the plunger (108) along the axis (A-A).
8. The lock mechanism (100) as claimed in claim 1, wherein the handle (102) comprises a threaded portion (114) to receive and fasten to the second end (108b) of the plunger (108) and a flat portion (116) extending perpendicular to the threaded portion (114).
9. The lock mechanism (100) as claimed in claim 2, wherein the actuator (120) comprises:
 - a block (122) disposed at a central portion of the housing (210);
 - a slider (124) movably disposed within the block (122), wherein the slider (124) is connected to the block (122) at one end and to the plunger (108) at an other end;
 - a resilient member (125) attached to the slider and the plunger (108), wherein the resilient member (125) is configured to bias the plunger (108) in at least one of the first position and the second position;
 - a rack (126) defined proximate to the second end of the plunger (108); and
 - a pinion (128) engageable with the rack (126) to displace the plunger (108) along the axis (A-A).
10. The lock mechanism (100) as claimed in claim 1, wherein the index plunger (104) comprises:
 - a body (132) defined with a knob (130) at one end and an opening within the body (132), wherein the knob is rotatable about the axis (B-B);
 - a base (134) disposed within the opening of the body (132); and

a spring (136) mounted between the base (134) and the body (132), wherein the spring (136) is configured to bias the body (132) in at least one of the first position and the second position upon actuating the knob (130).

Dated this 24th day of March 2023

-- Digitally Signed--

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ABSTRACT

A LOCK MECHANISM FOR A DIGITAL DIAL INDICATOR

Present disclosure relates to a lock mechanism (100) for a digital dial indicator (200). The mechanism comprises a plunger (108) movably disposed in a housing (210) and displaceable from a first position to a second position. A contact portion (109) is attached to a first end of the plunger. A handle (102) is fixedly attached to a second end of the plunger. The handle is configured to displace the plunger between the first position and the second position. At least one bracket (106) is attached to the plunger (108) proximate to the handle. An index plunger (104) is fixedly attached to the at least one bracket. The index plunger is configured to selectively actuate the handle and arrest a movement of the plunger in the second position. The mechanism retracts the and holds the plunger in place to protect the plunger from breakage.

[**FIG. 1** and **FIG. 2** are the representative figures.]

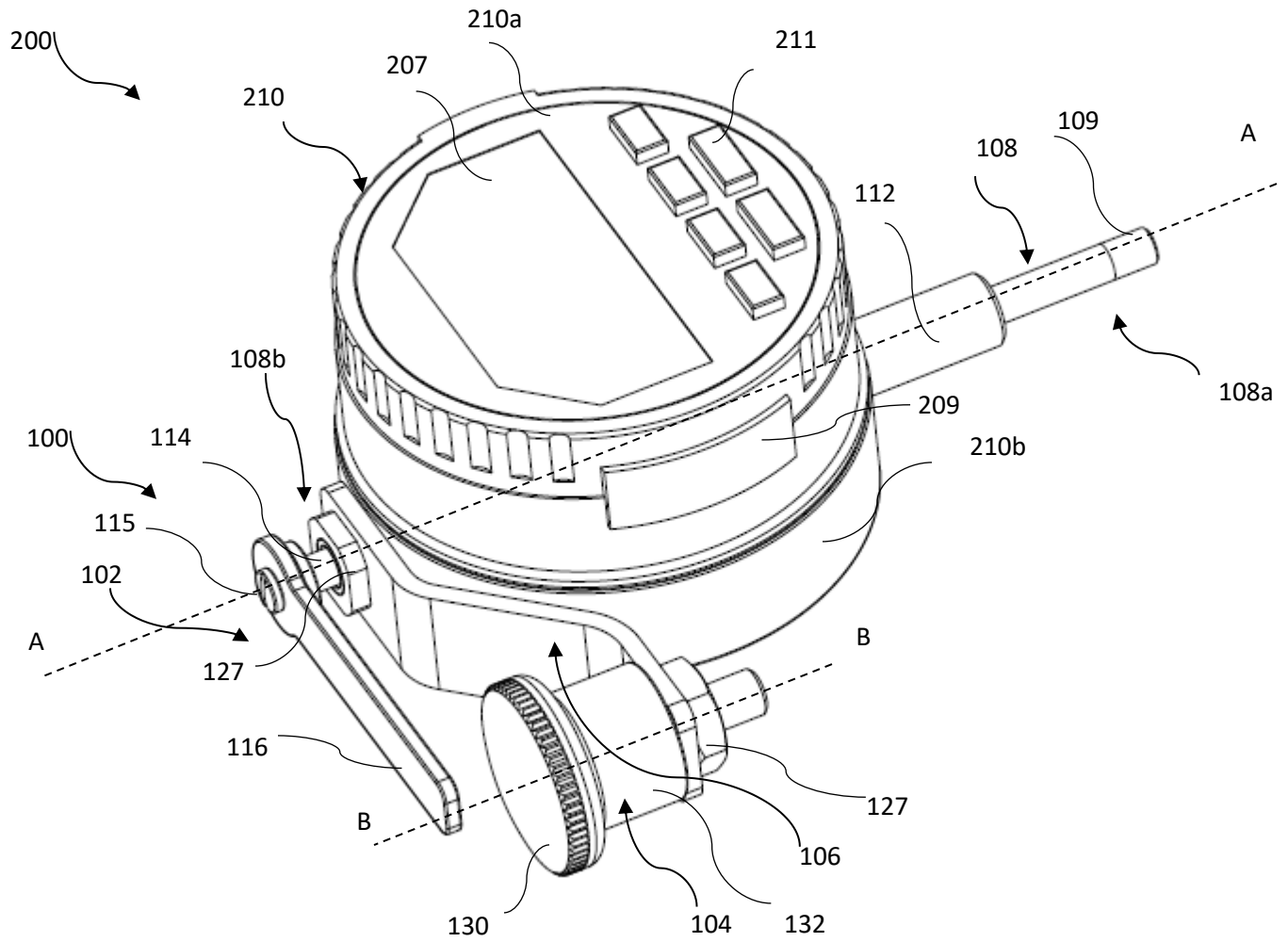


FIG. 1

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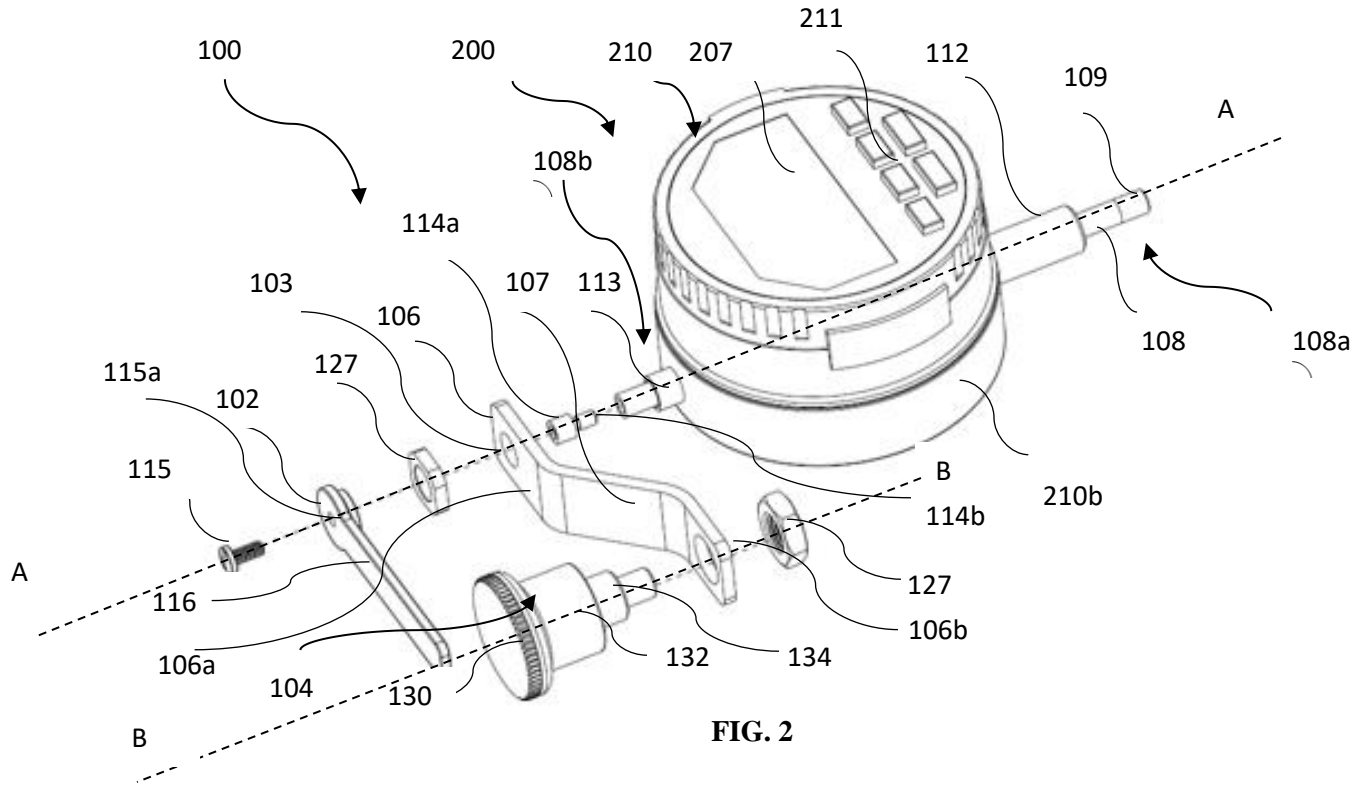


FIG. 2

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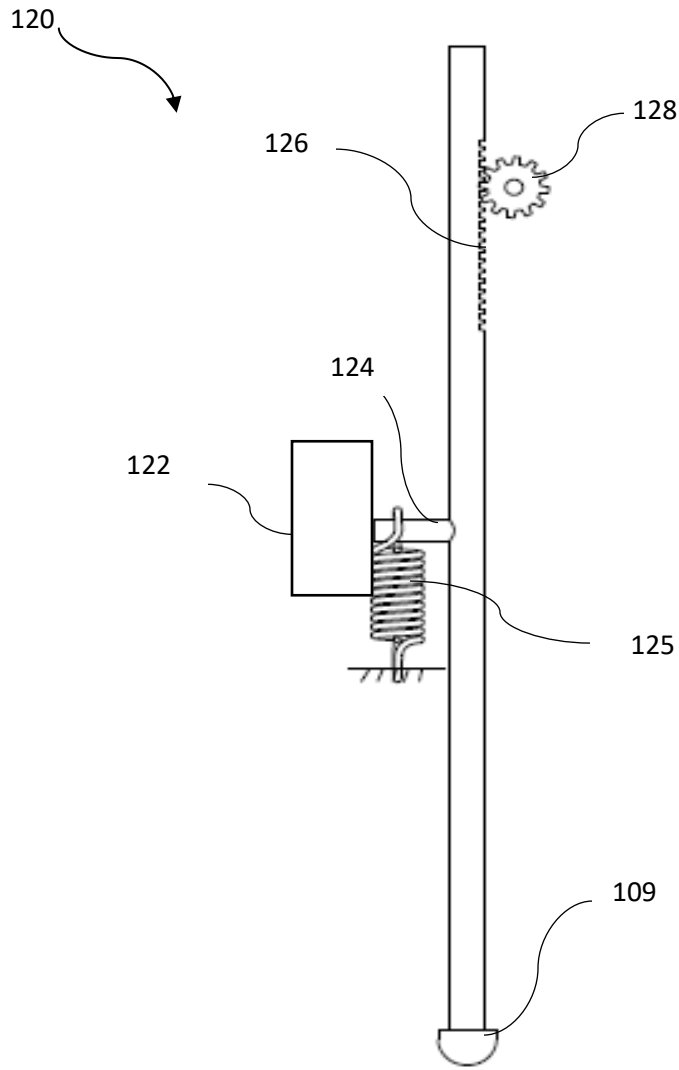


FIG. 3

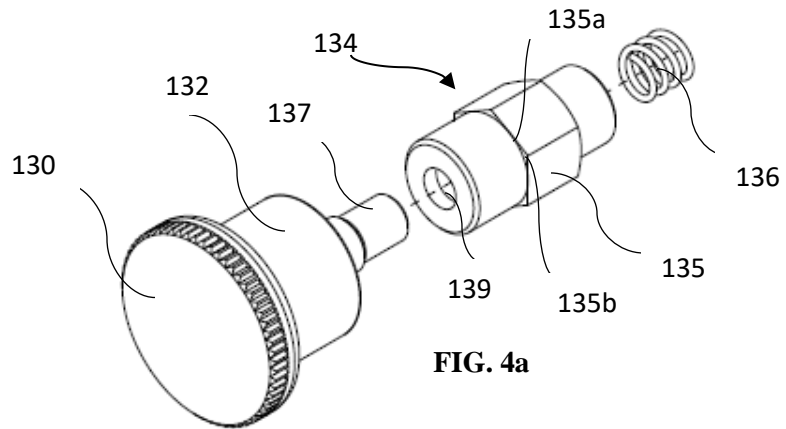


FIG. 4a

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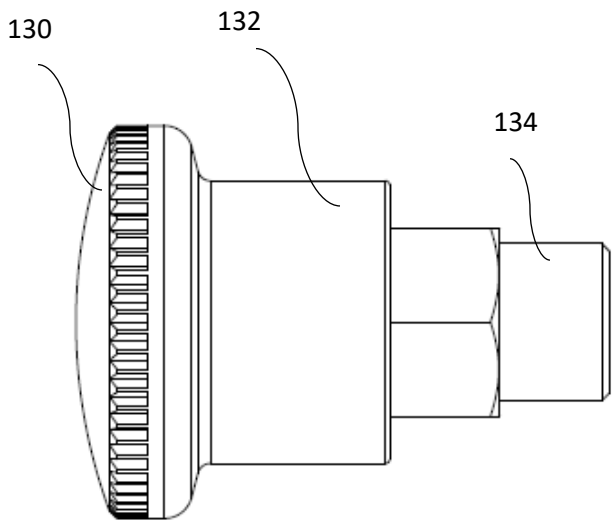
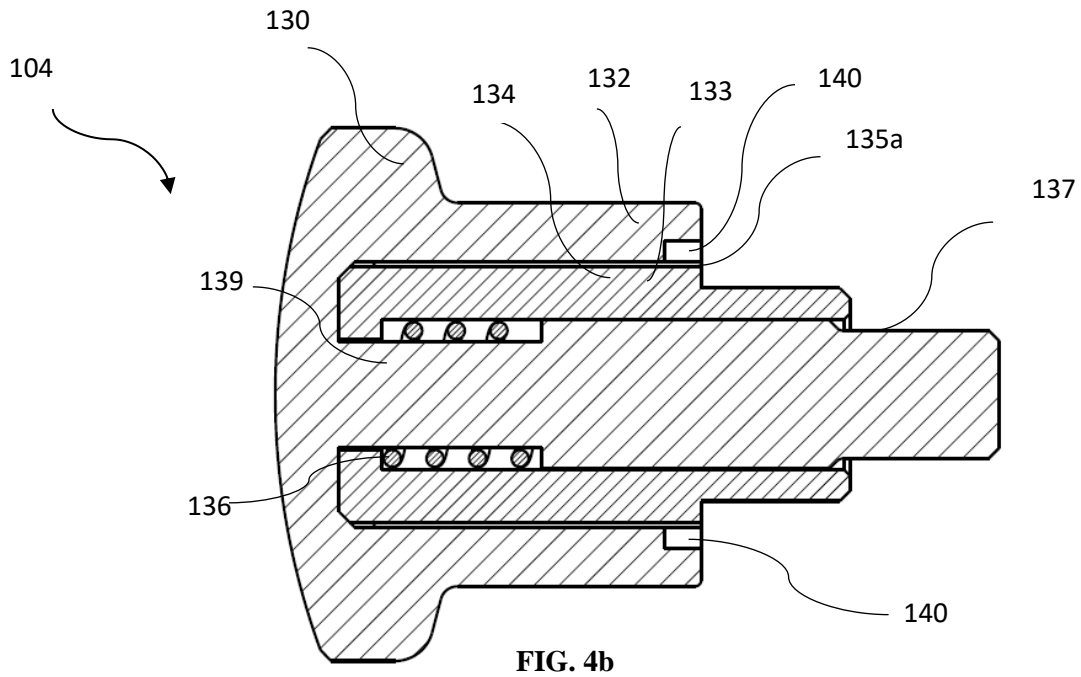


FIG. 5a

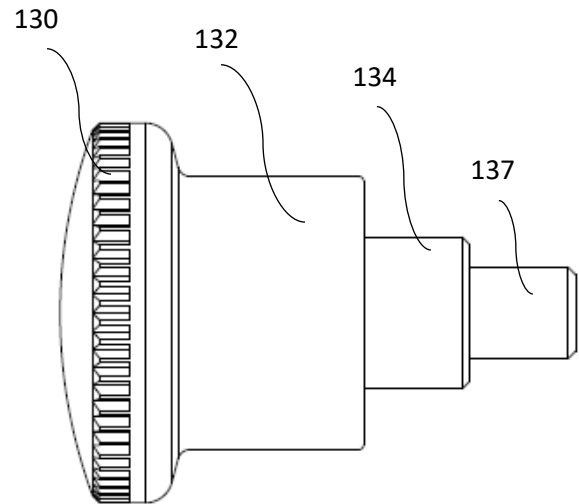


FIG. 5b