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(12) **United States Patent**
Geiger

(10) **Patent No.: US 9,237,821 B2**
(45) **Date of Patent: Jan. 19, 2016**

(54) **ASSEMBLY FOR MOUNTING SHADES**

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(73) Assignee: **GEIGTECH EAST BAY LLC**, Charleston, SC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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PCT Pub. Date: **Nov. 21, 2013**

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Related U.S. Application Data

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(51) **Int. Cl.**

E06B 9/17	(2006.01)
A47H 1/13	(2006.01)
E06B 9/50	(2006.01)
A47H 5/14	(2006.01)

(52) **U.S. Cl.**
CPC .. ***A47H 1/13*** (2013.01); ***A47H 5/14*** (2013.01); ***E06B 9/50*** (2013.01)

(58) **Field of Classification Search**
CPC A47H 1/13; B60J 1/2063; E06B 9/44; E06B 9/42; E06B 9/40
USPC 248/266, 267, 268, 273, 252; 160/323.1, 324, 325, 326
See application file for complete search history.

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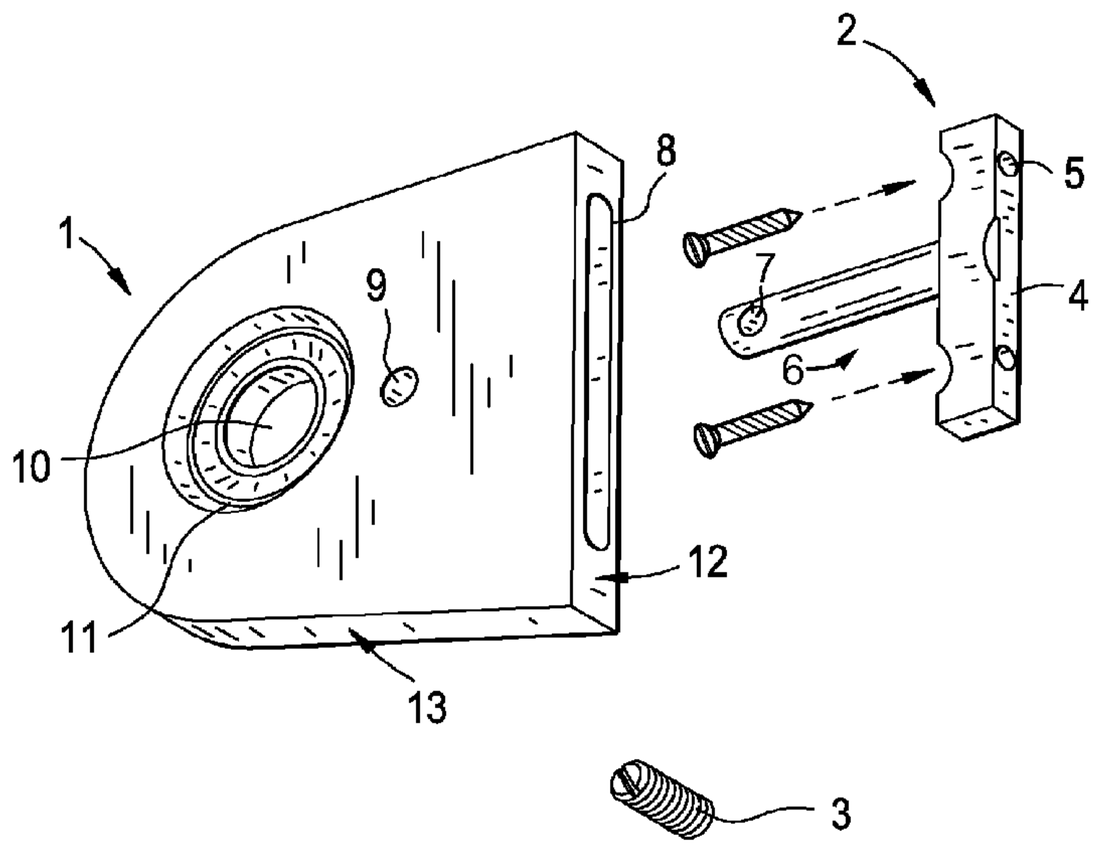
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(74) *Attorney, Agent, or Firm* — Foley & Lardner LLP

(57) **ABSTRACT**

The present embodiments provide for a system of fastening devices, e.g., mounts, brackets, and assemblies for installing roller window shades. In one embodiment, the fastening device system comprises two one-piece, disk-shaped mounting brackets, one for each end of a shade tube, wherein the mounting brackets are configured such that, in use, the outer circumference of the brackets are visible; the mounting means being largely hidden within the bracket or by the shade. In a particular embodiment, the fastening system is designed for use with motorized shades, wherein one mounting bracket is configured to key the shade motor, and one mounting bracket is configured to receive the idler pin.

15 Claims, 16 Drawing Sheets



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FIG. 1

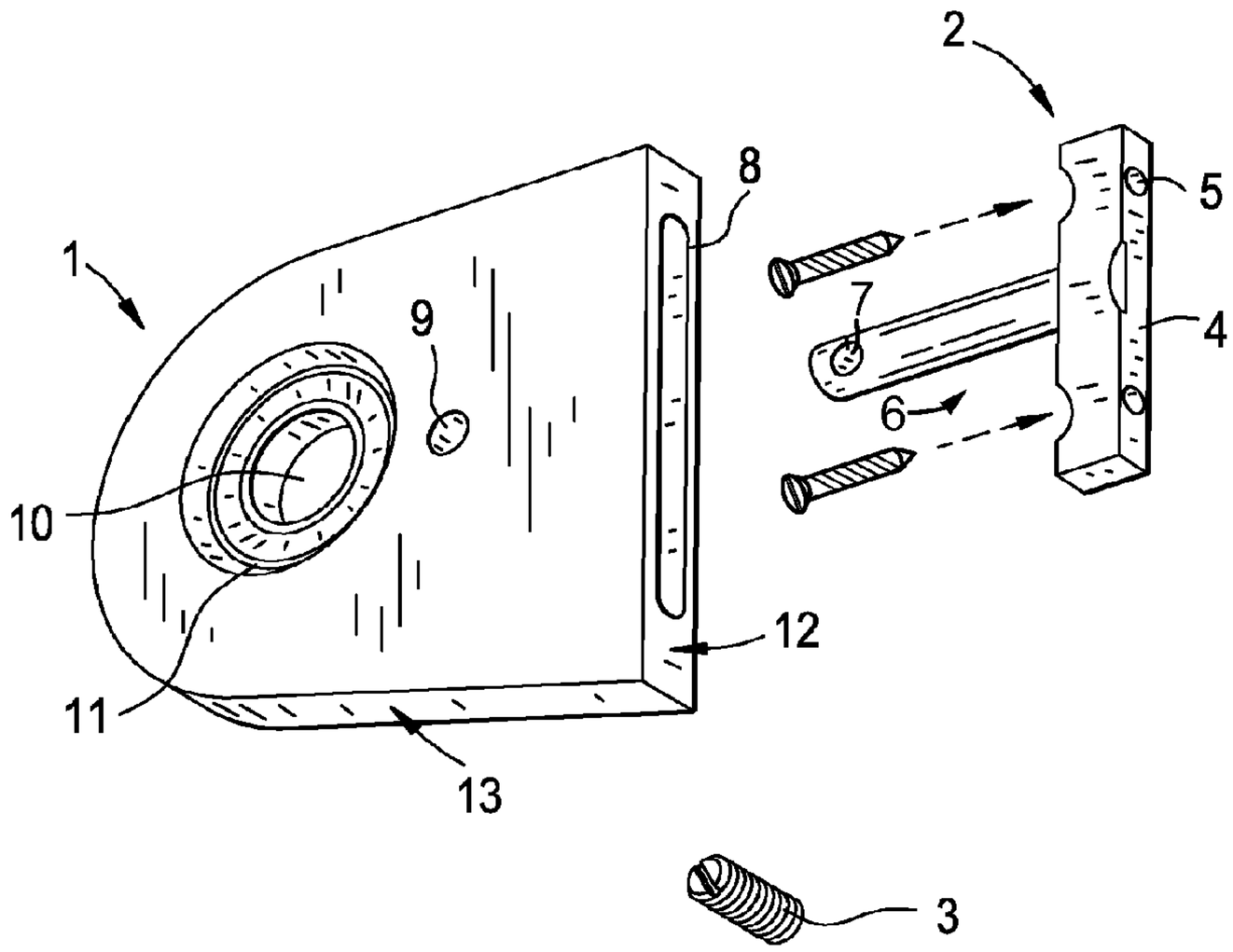


FIG. 2

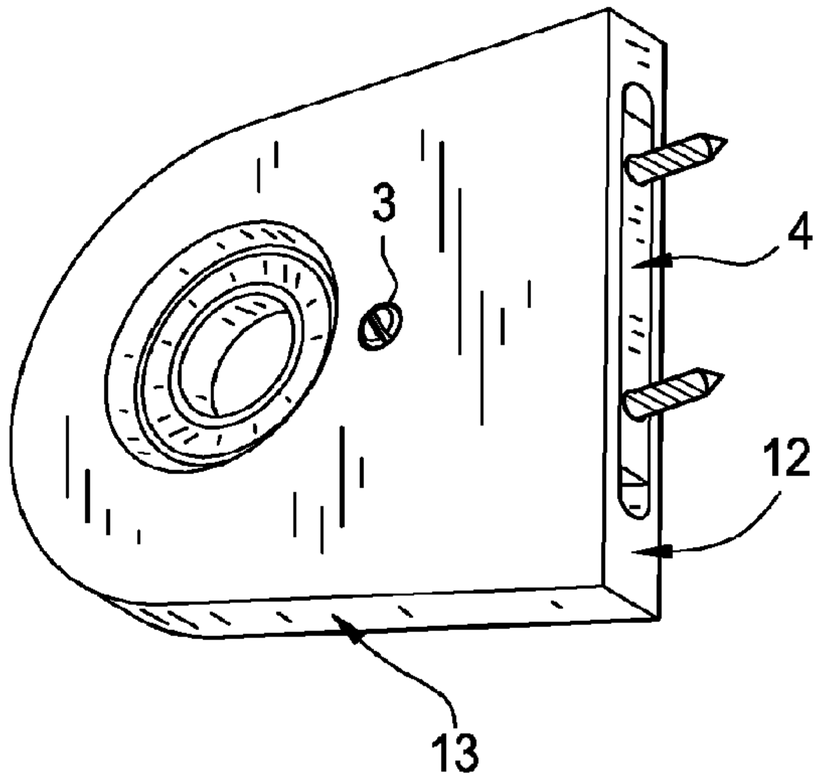


FIG. 3

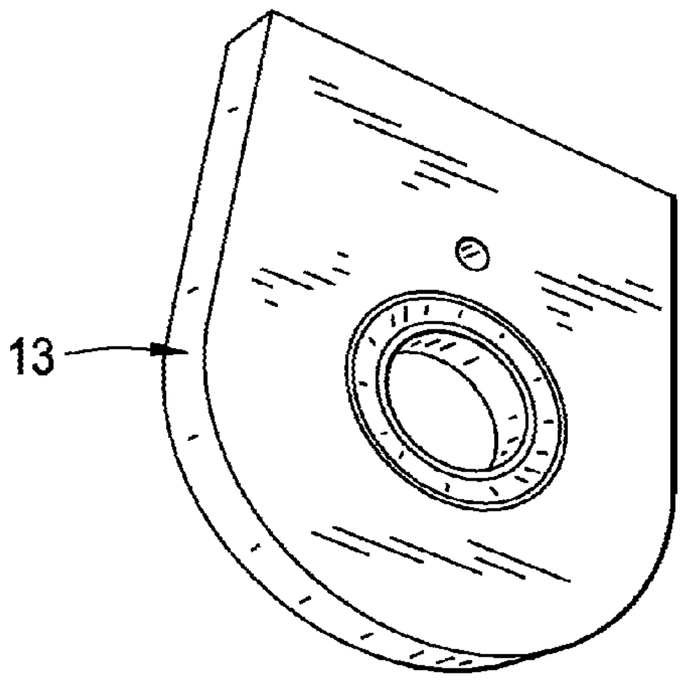


FIG. 4A

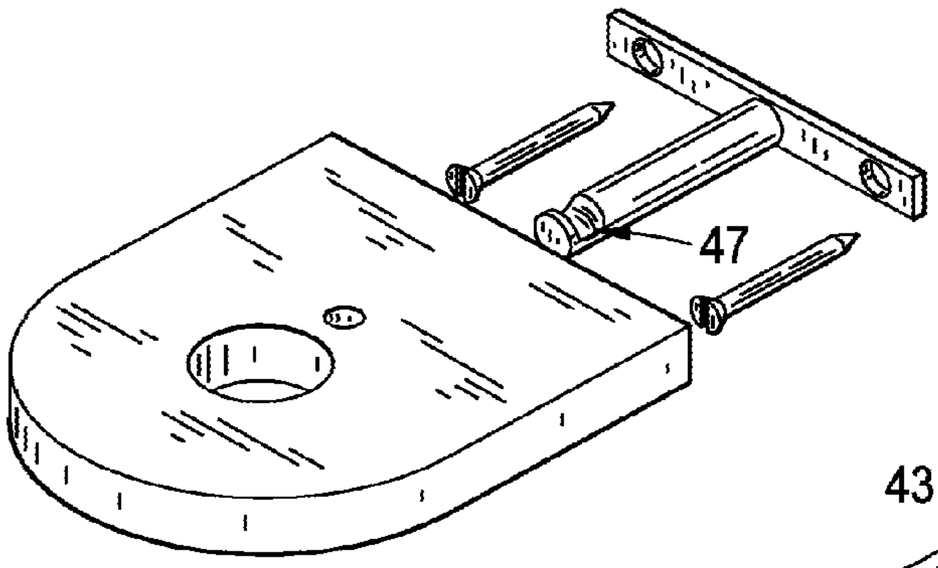


FIG. 4B

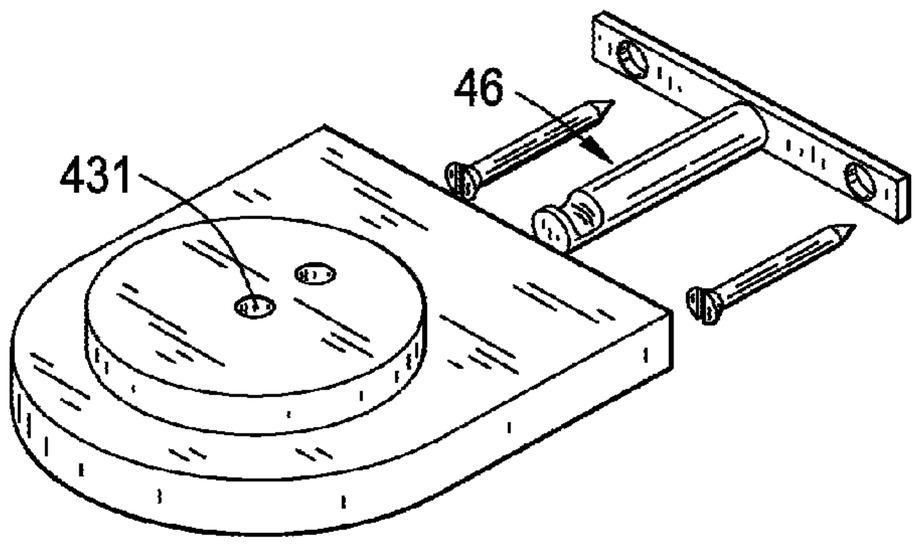


FIG. 4C

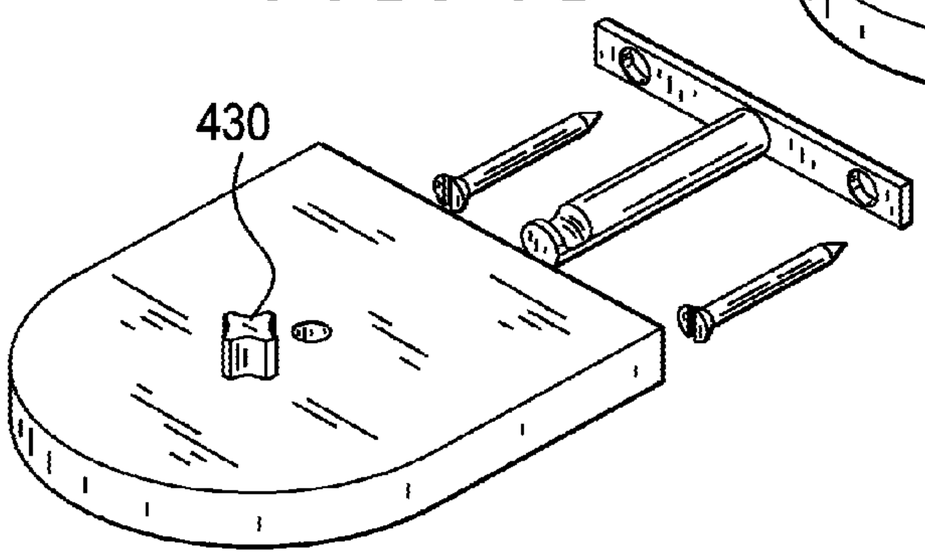


FIG. 5

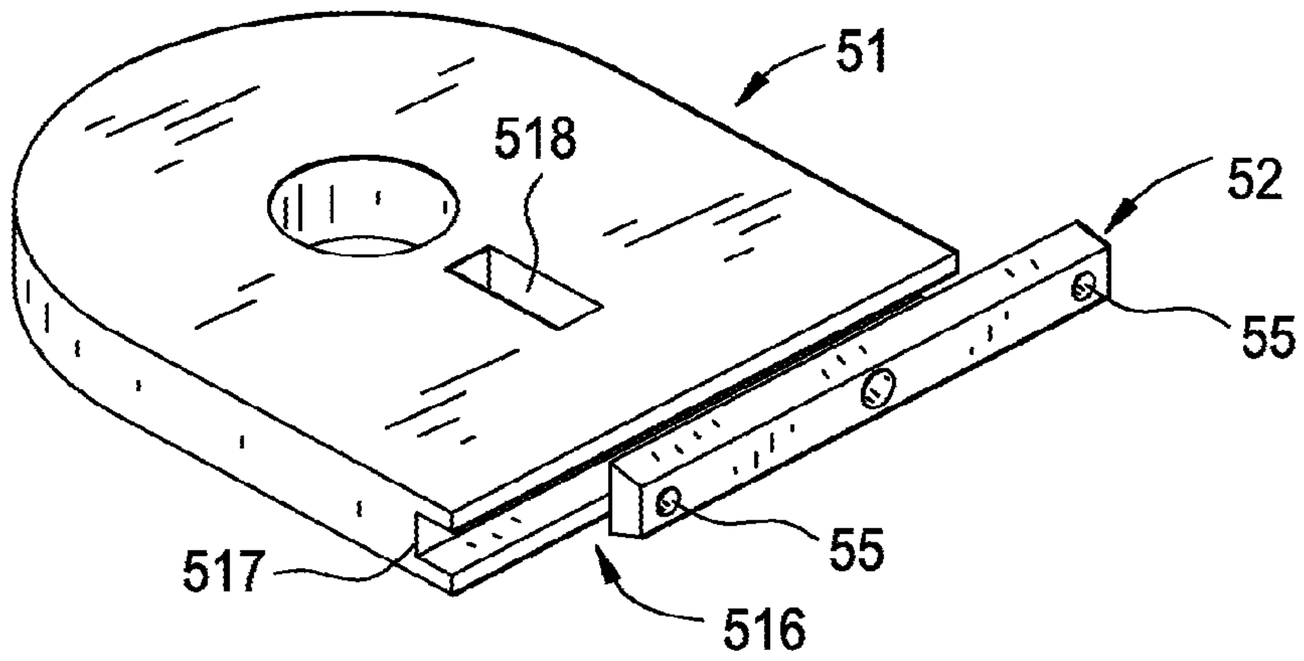


FIG. 6A

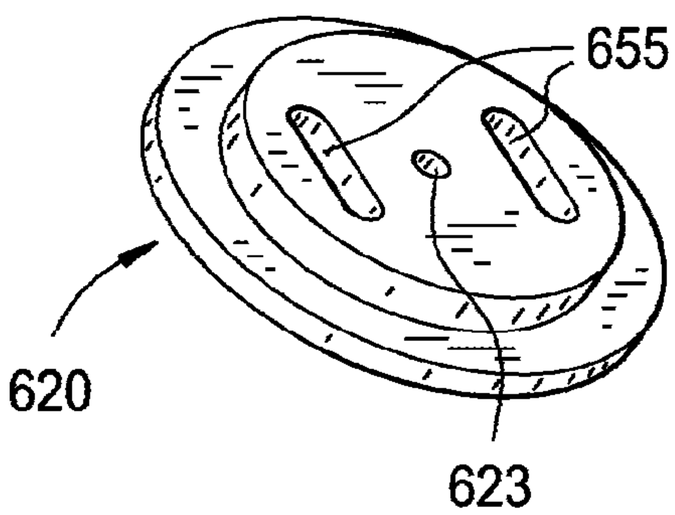


FIG. 6B

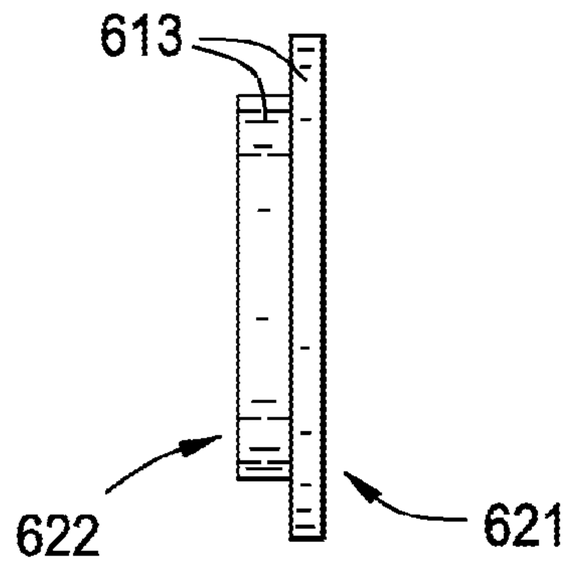


FIG. 6C

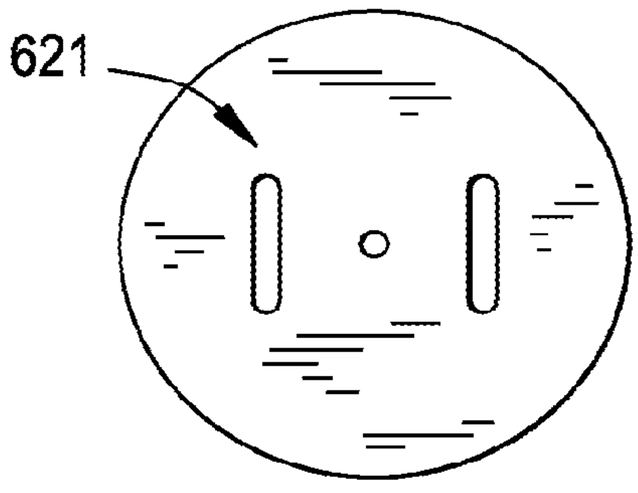


FIG. 6D

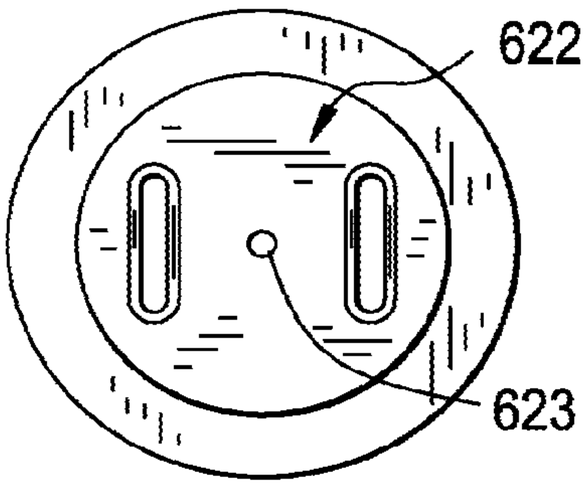


FIG. 7A

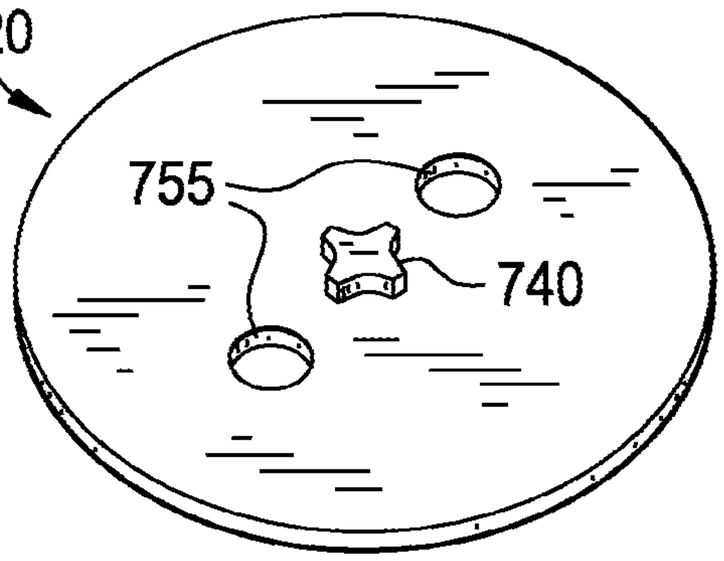


FIG. 7B

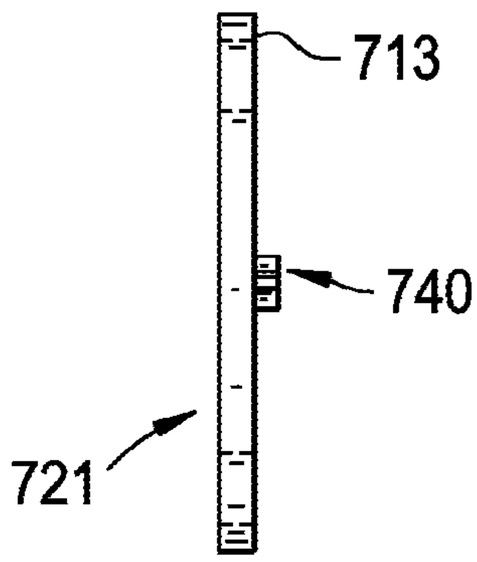


FIG. 7C

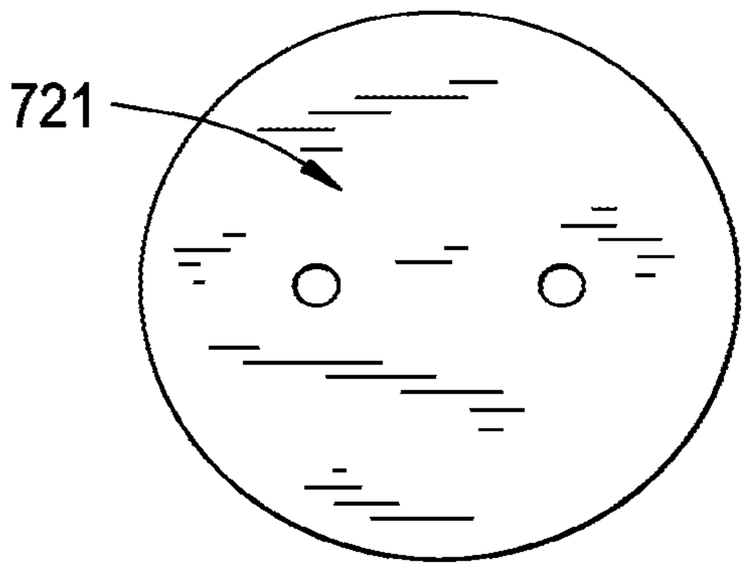


FIG. 7D

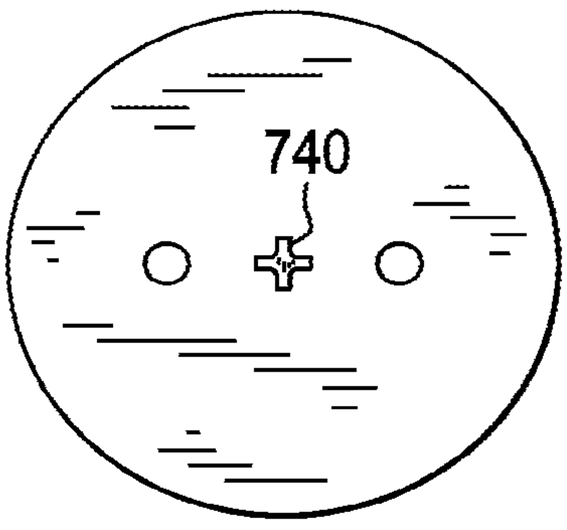


FIG. 8

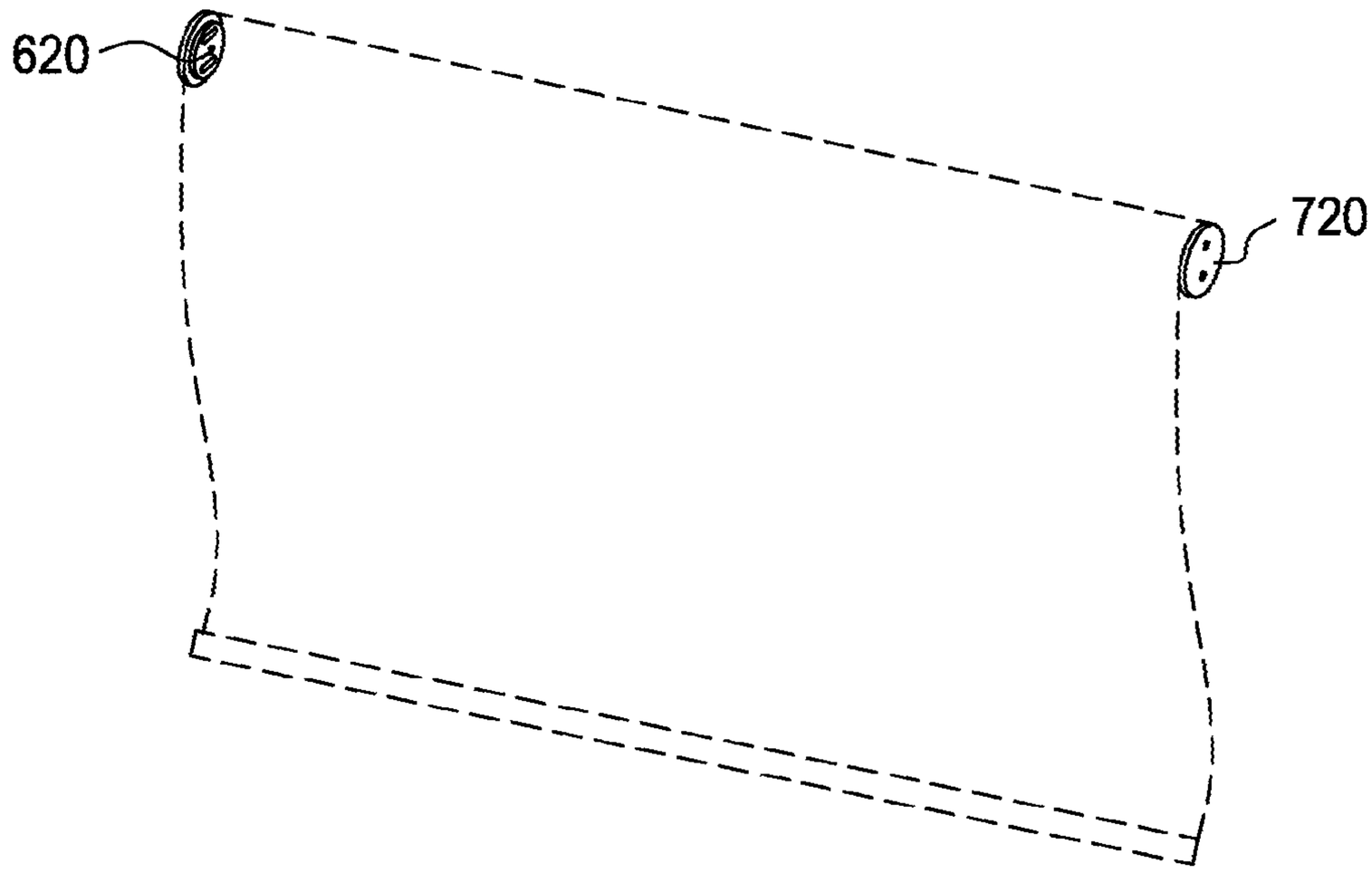


FIG. 9

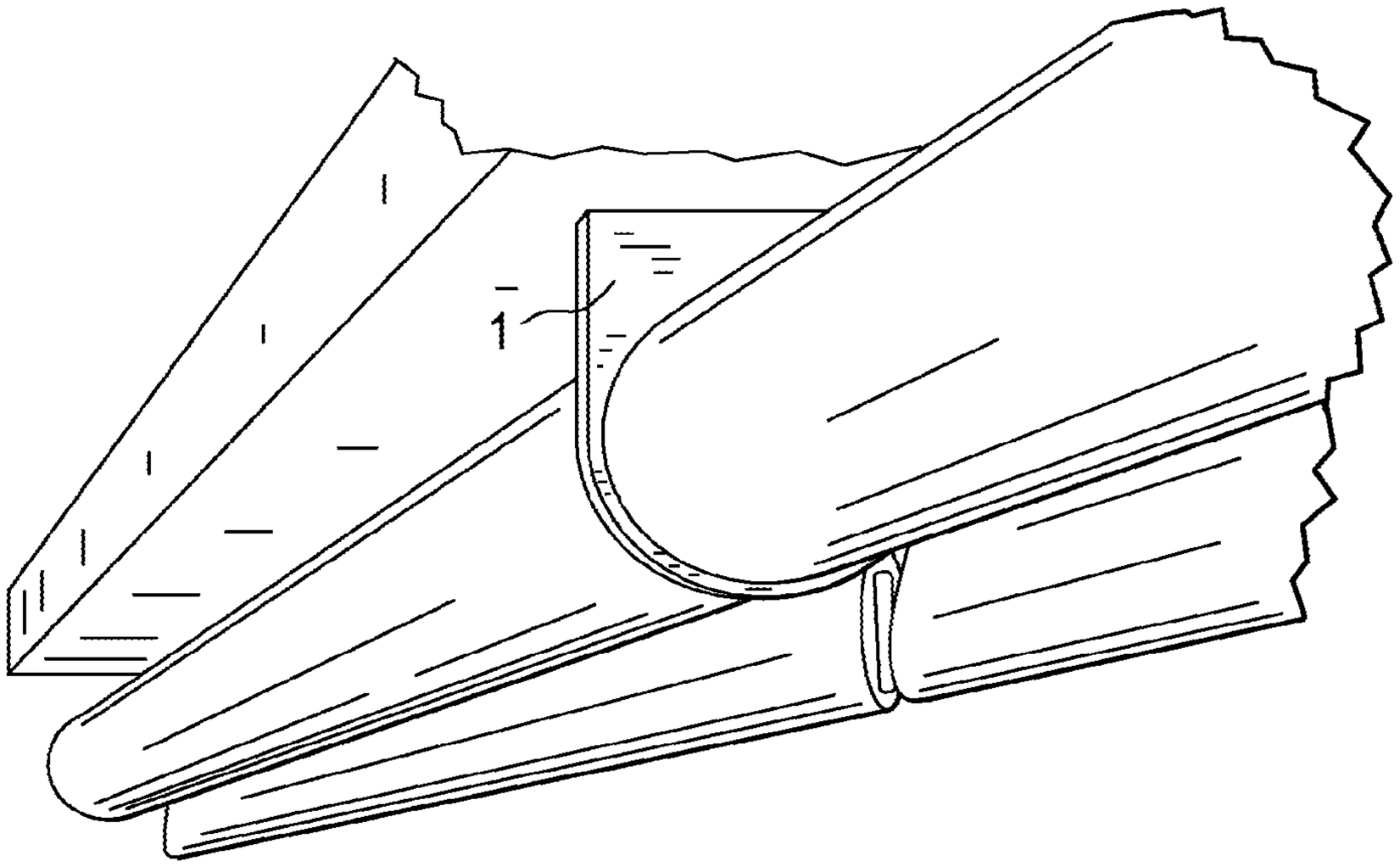


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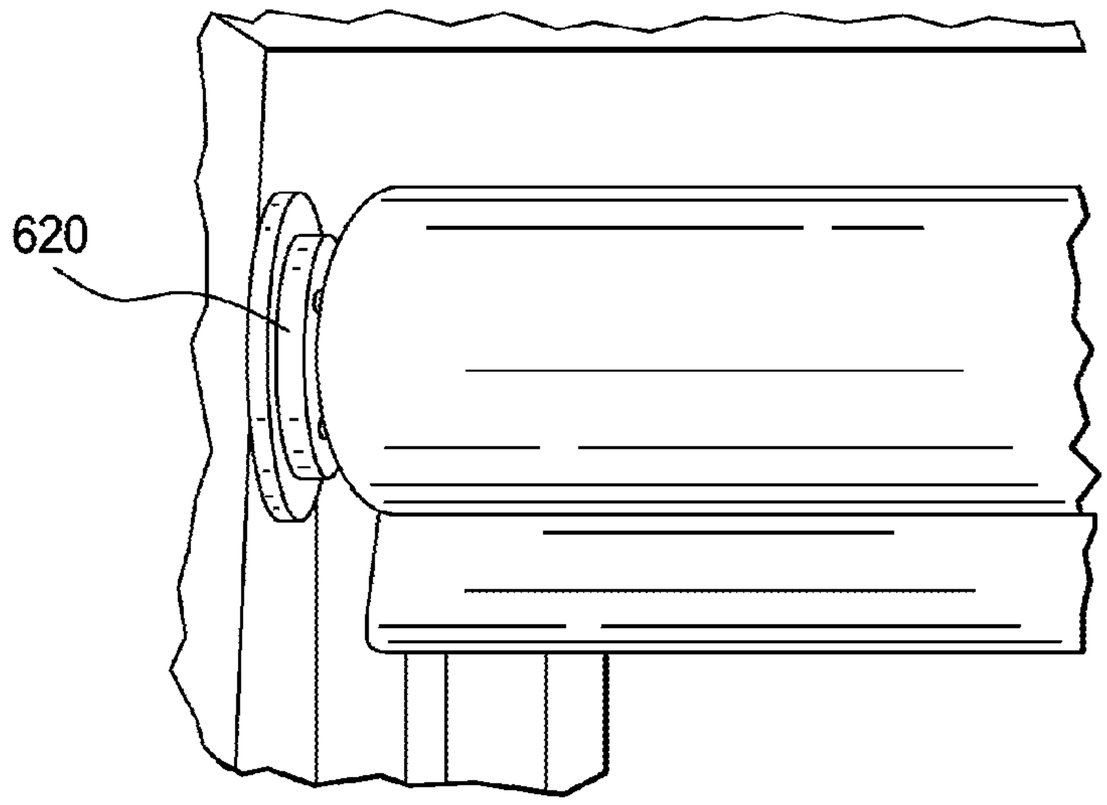


FIG. 11

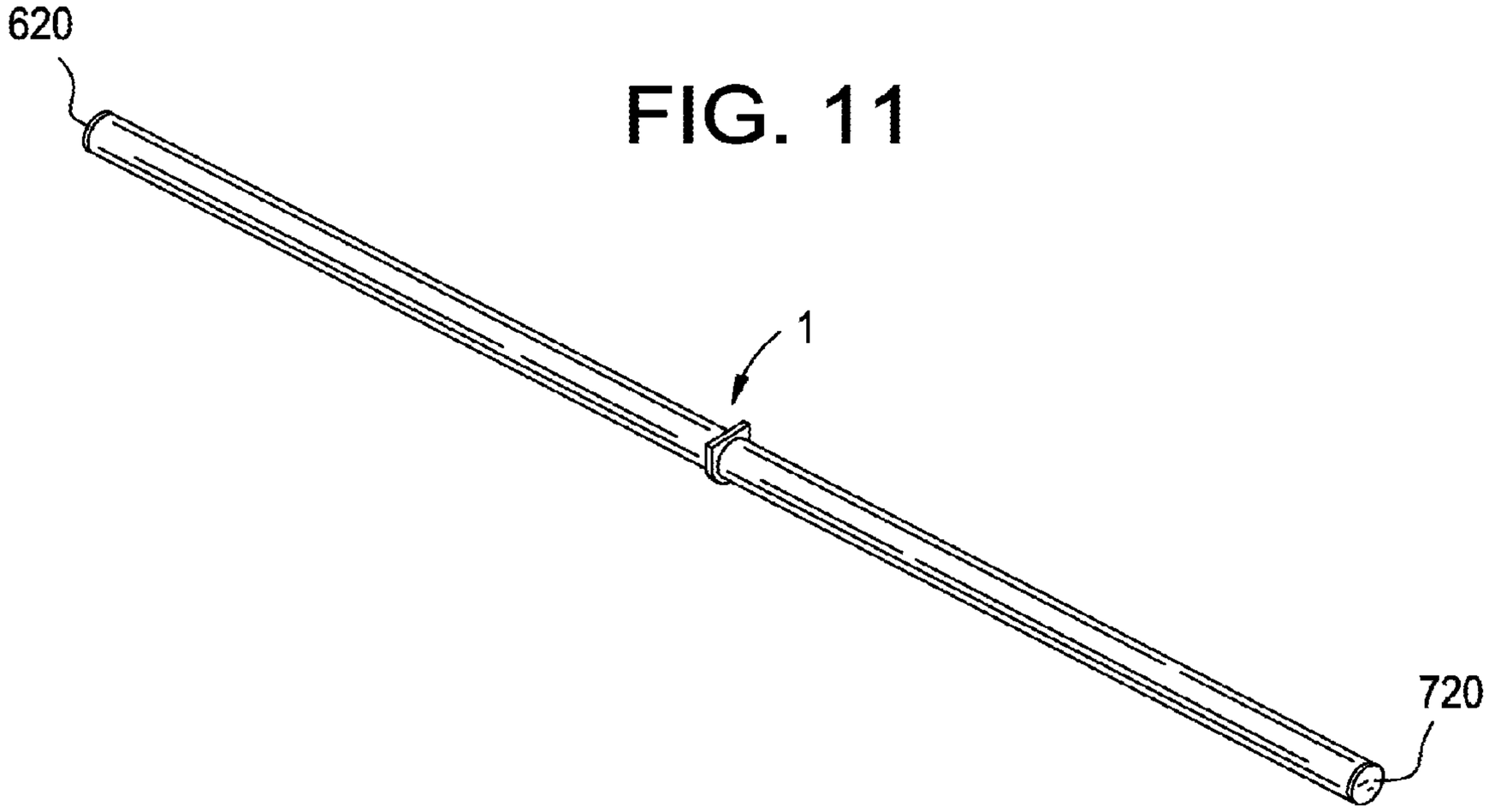


FIG. 12A

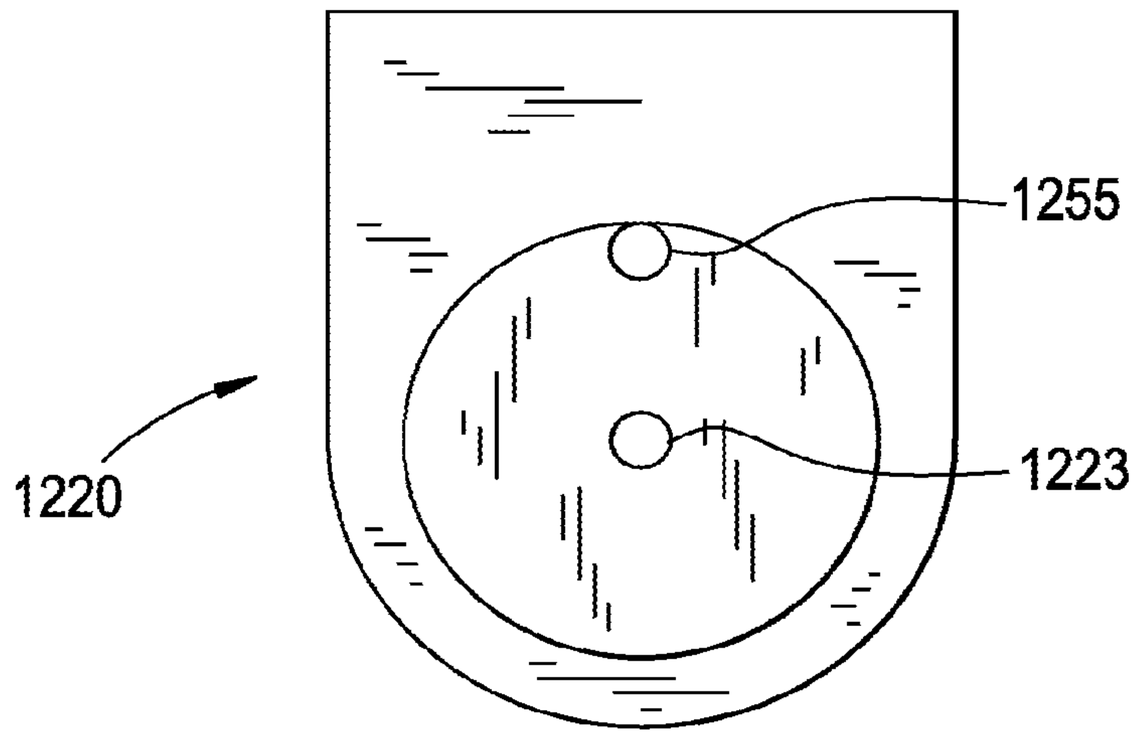


FIG. 12B

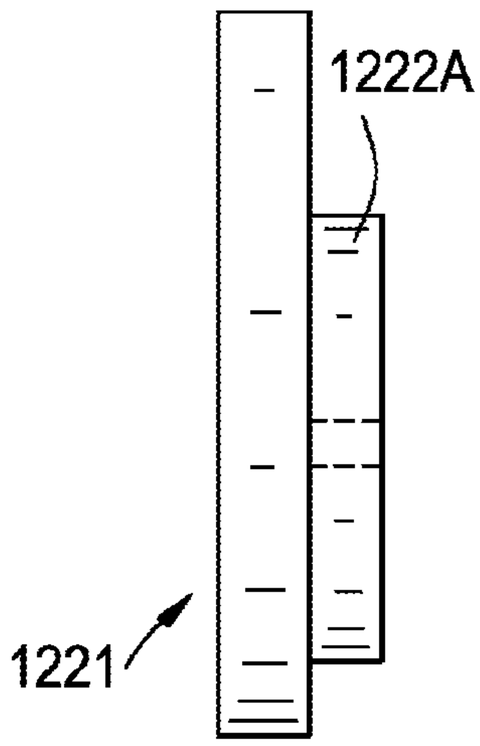


FIG. 12C

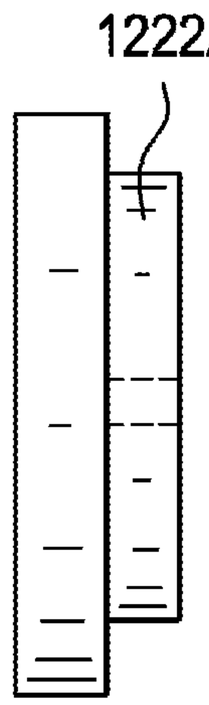


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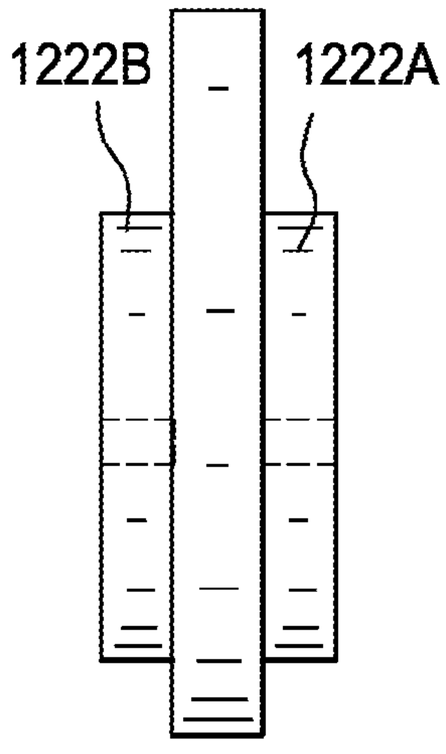


FIG. 12E

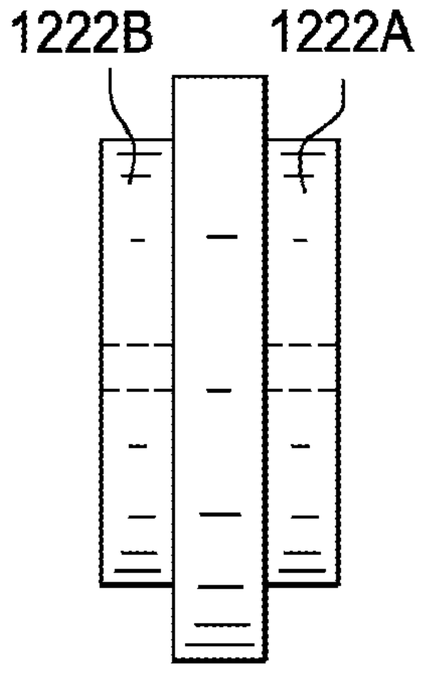


FIG.13A

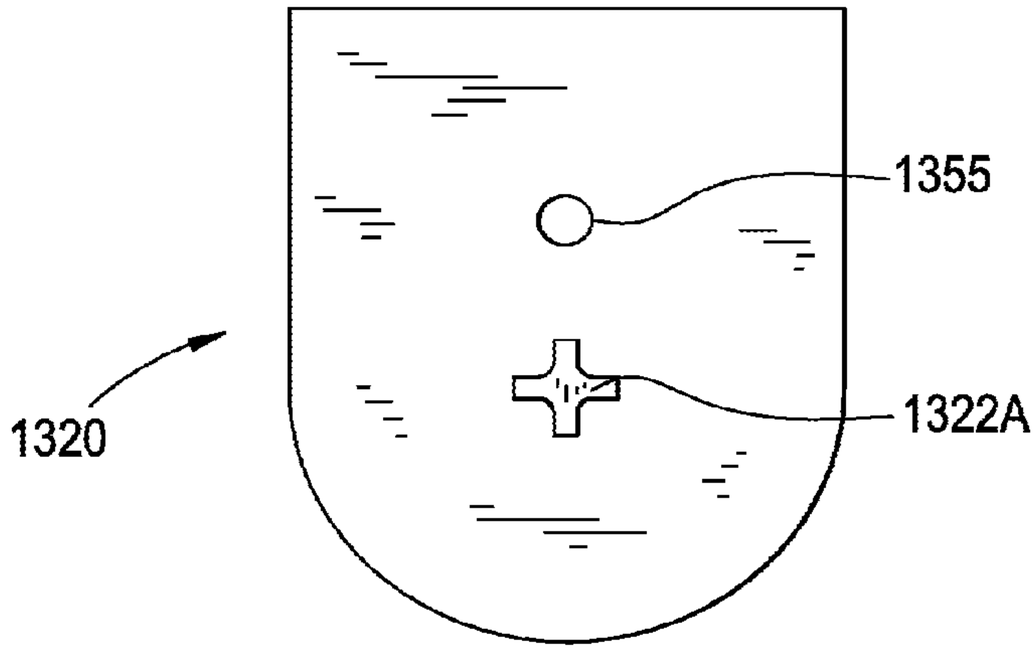


FIG.13B

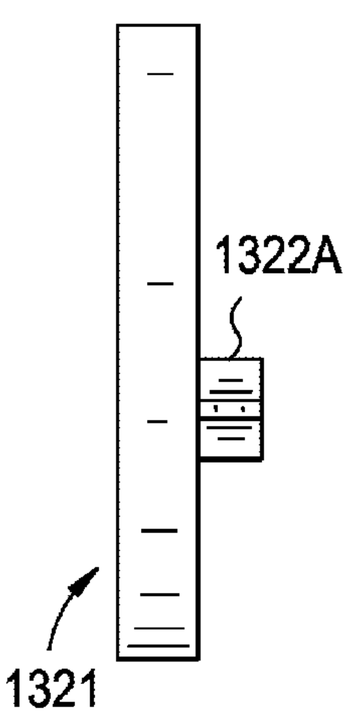


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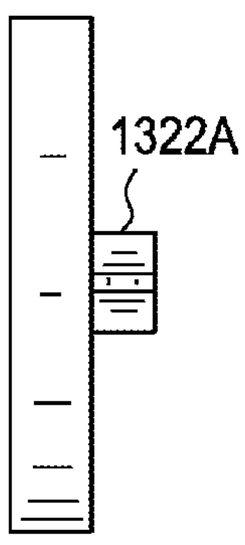


FIG.13D

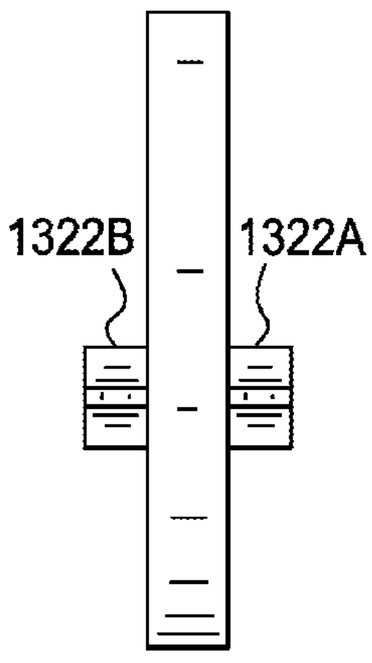


FIG.13E

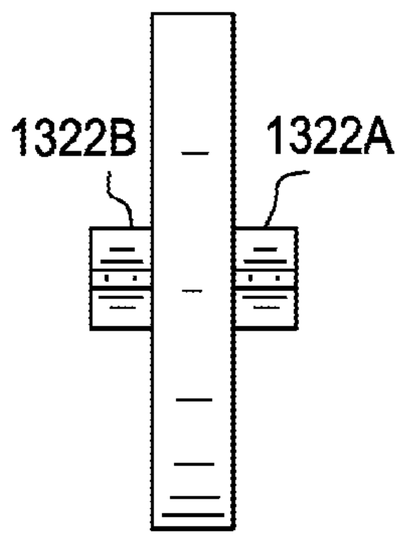


FIG. 14A

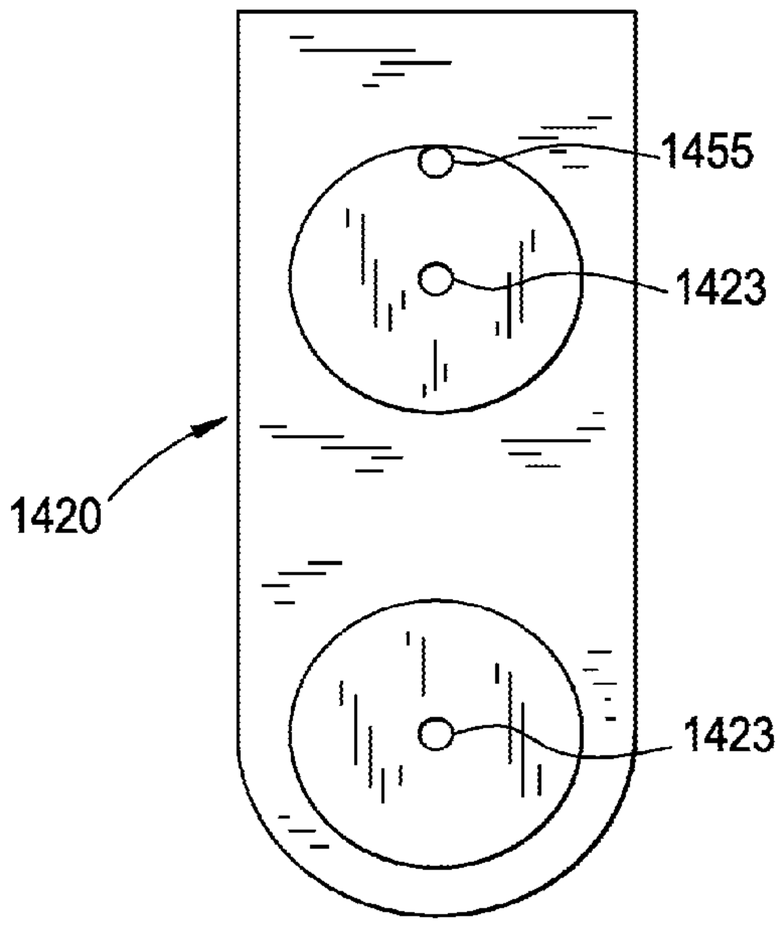


FIG. 14B

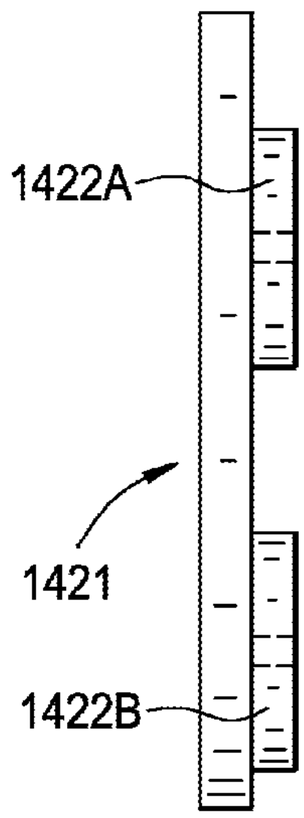


FIG. 14C

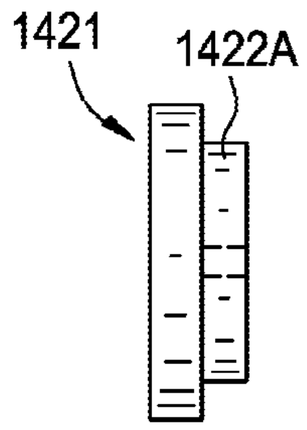


FIG. 14D

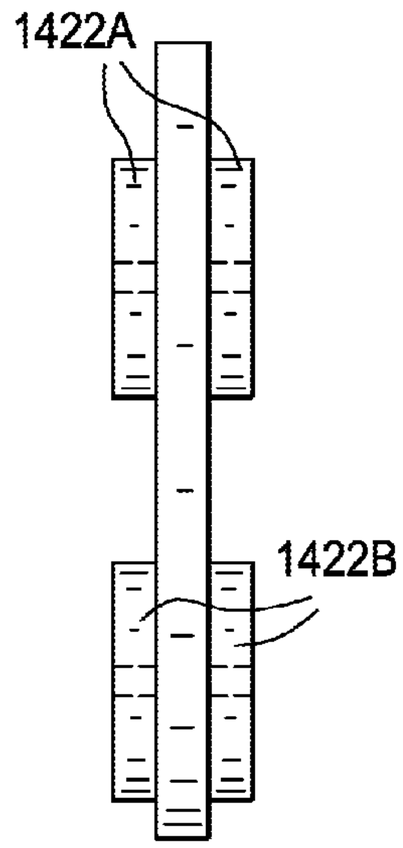


FIG. 14E

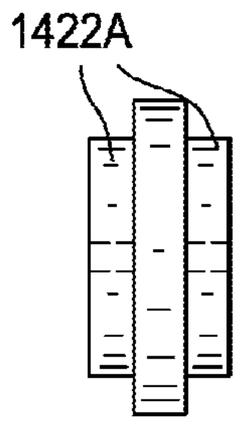


FIG. 15A

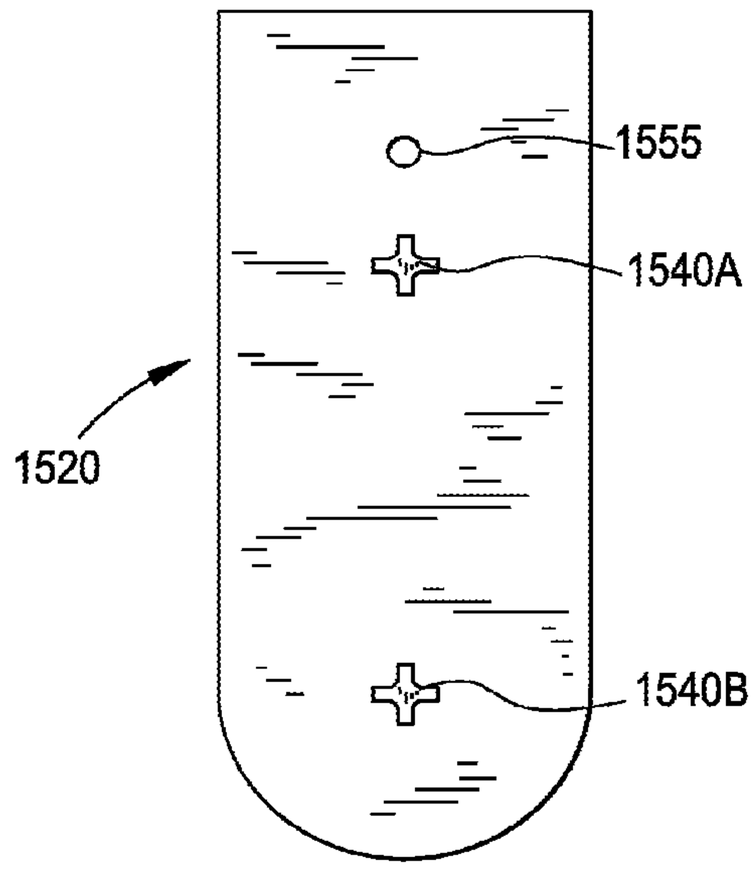


FIG. 15B

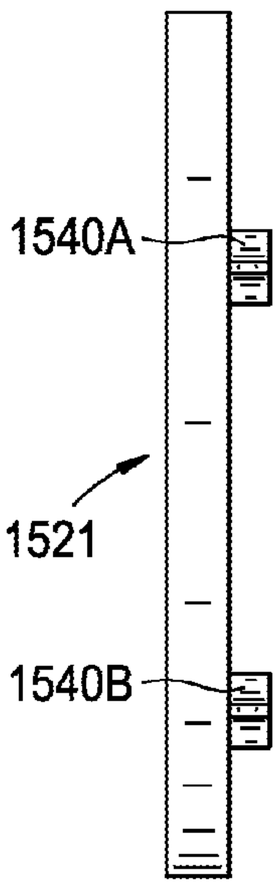


FIG. 15C

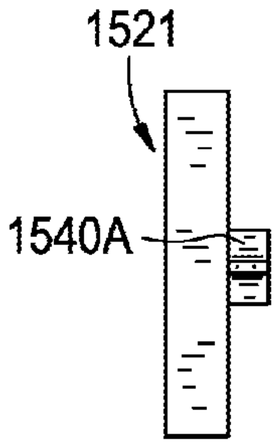


FIG. 15D

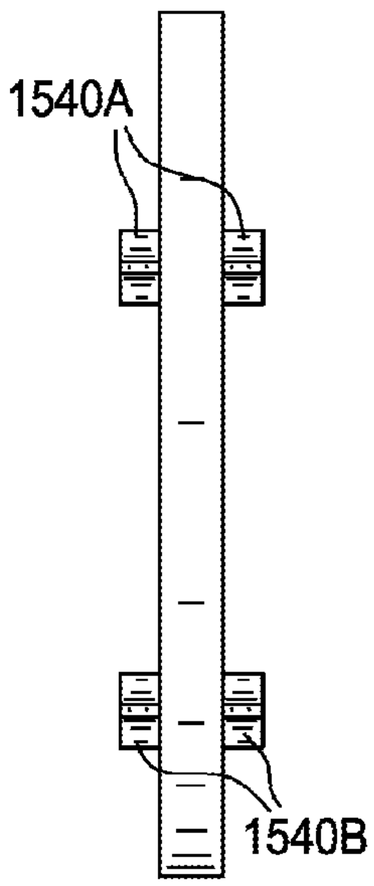


FIG. 15E

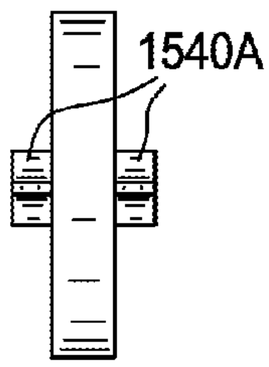


FIG. 16A

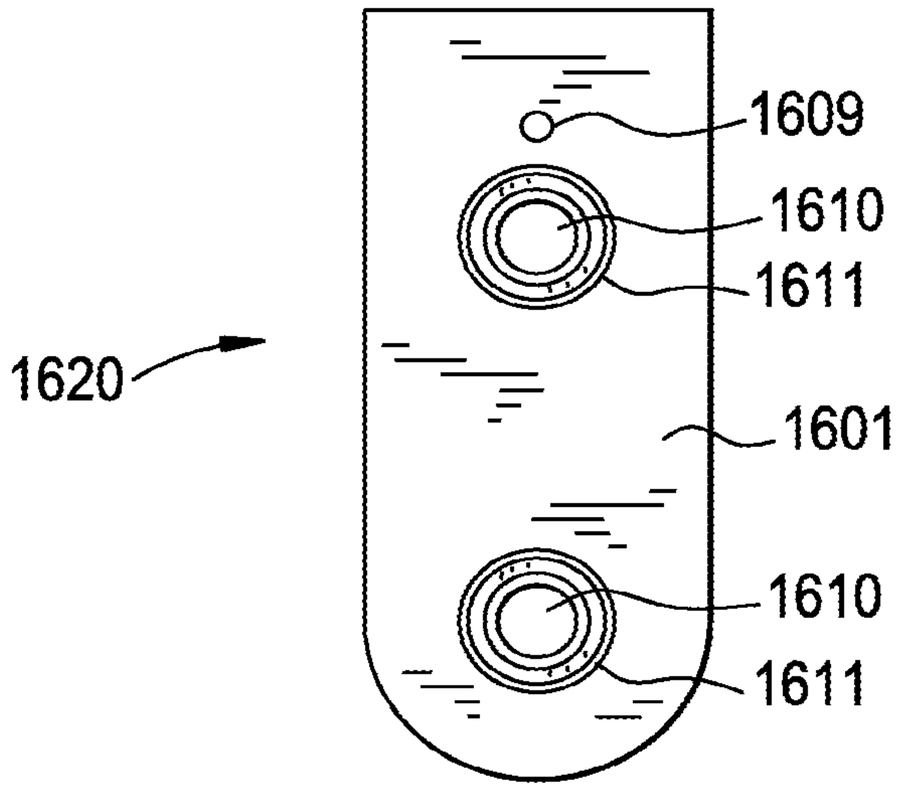


FIG. 16B

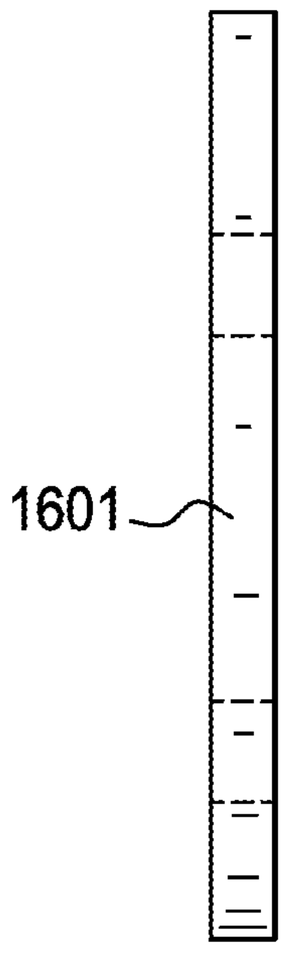


FIG. 16C

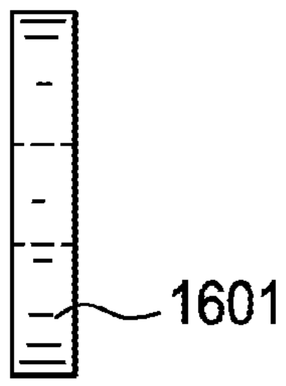


FIG. 17A

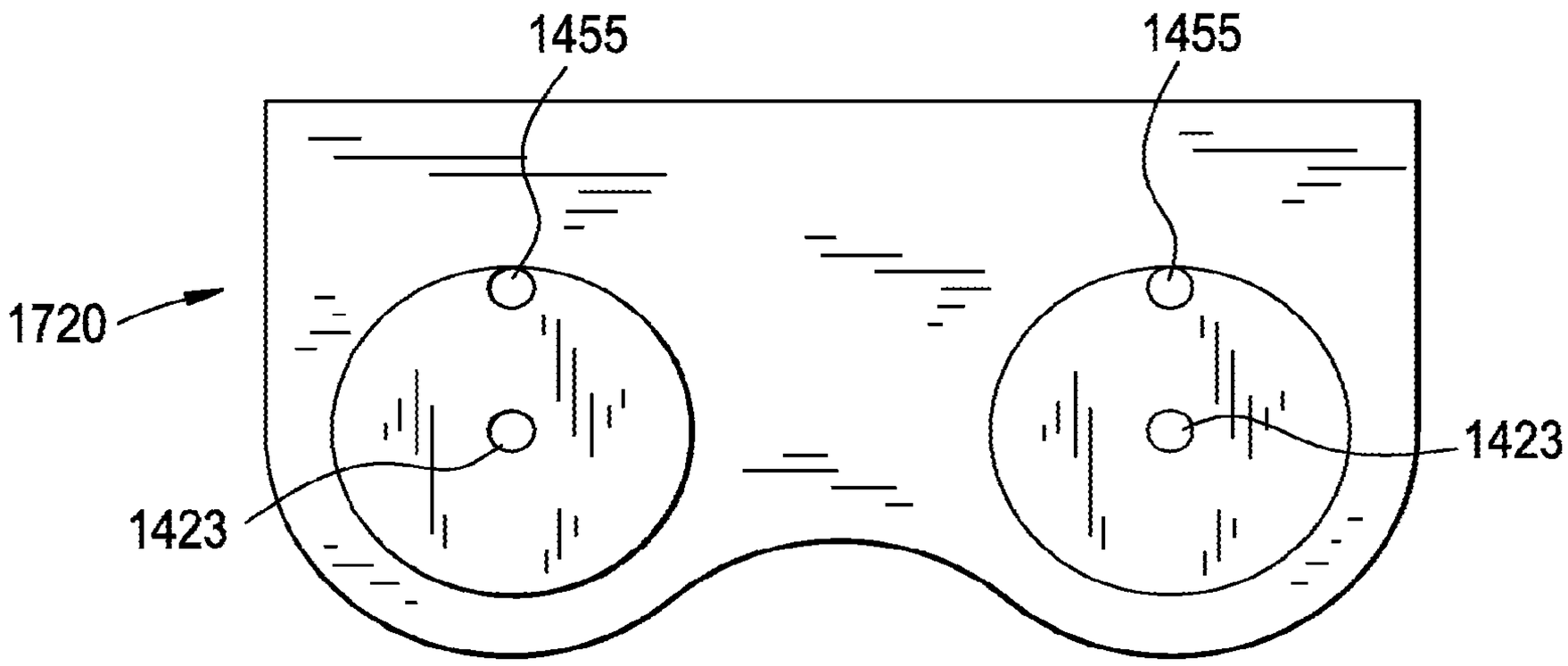


FIG. 17B

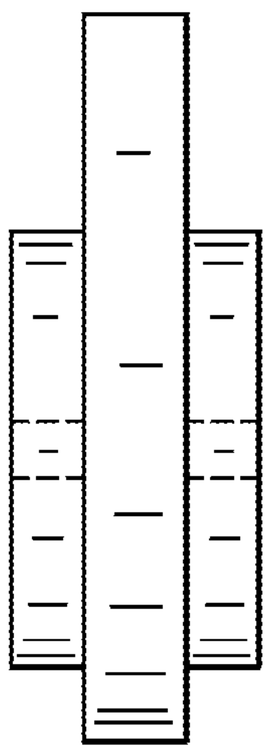


FIG. 17C



FIG. 18A

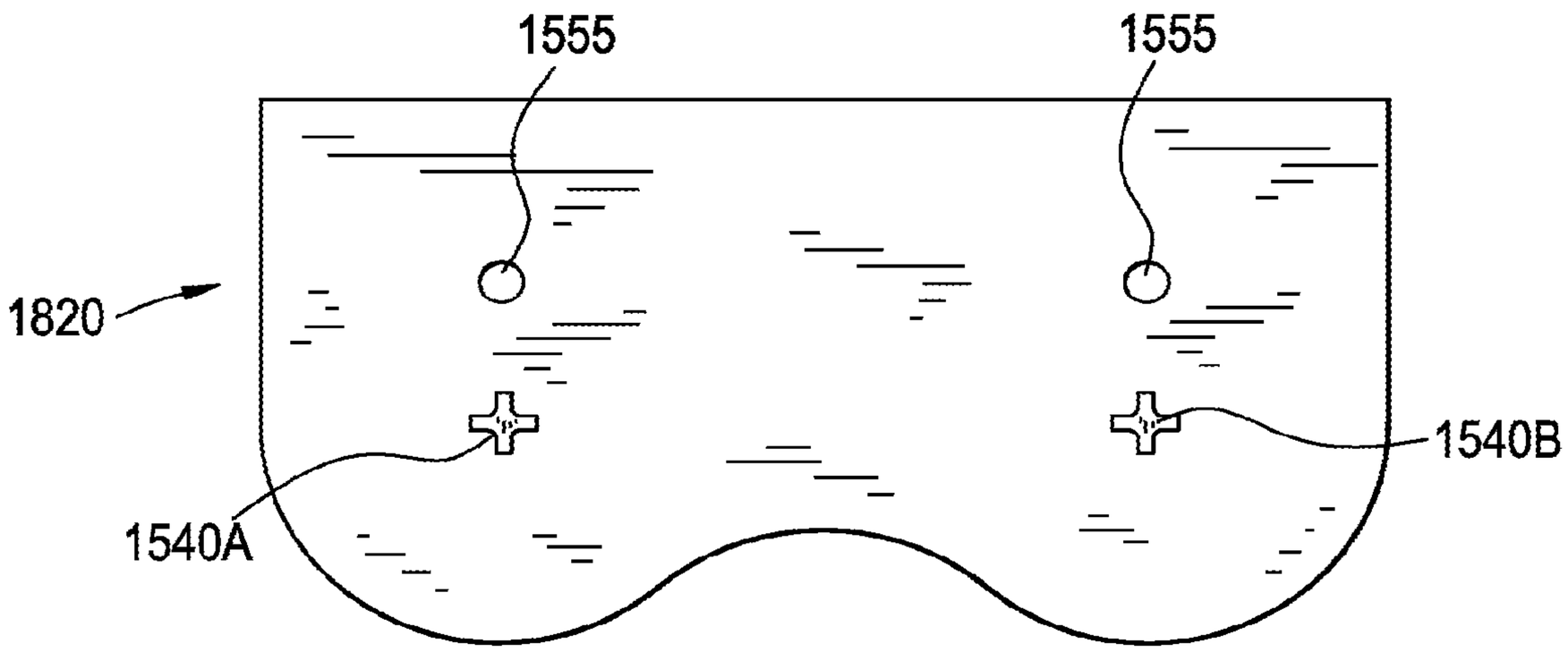


FIG. 18B

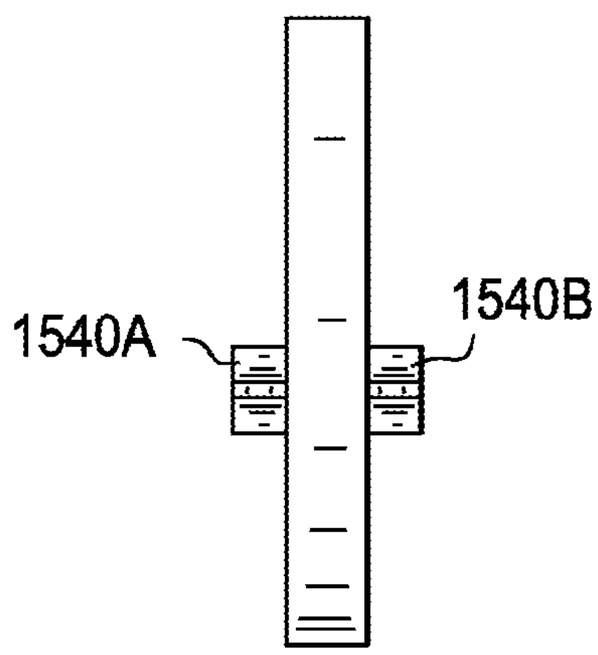


FIG. 18C

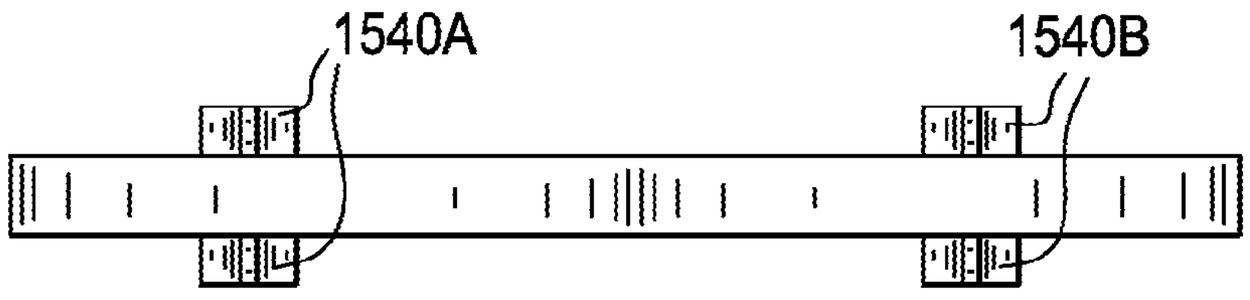


FIG. 19A

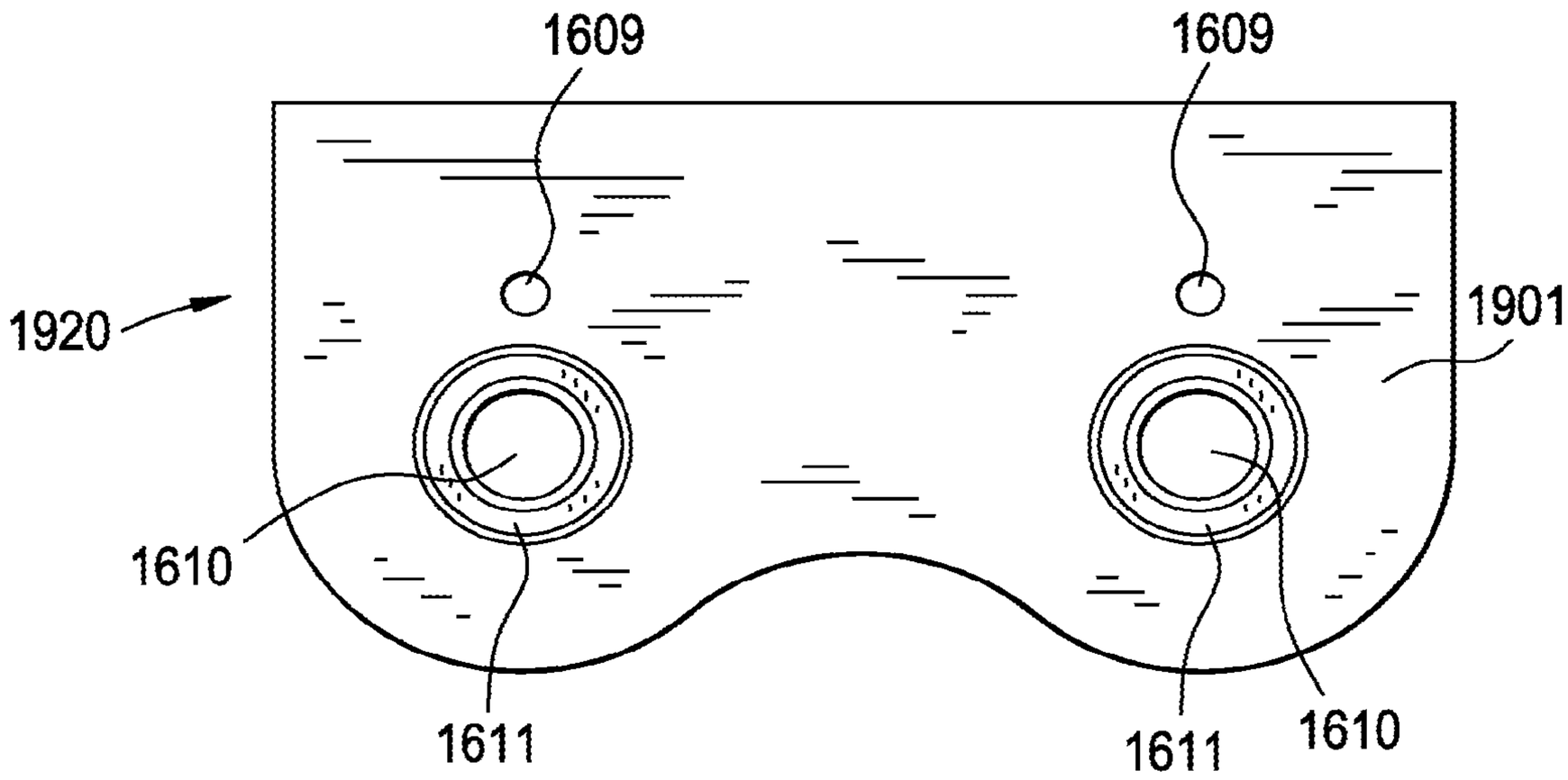


FIG. 19B

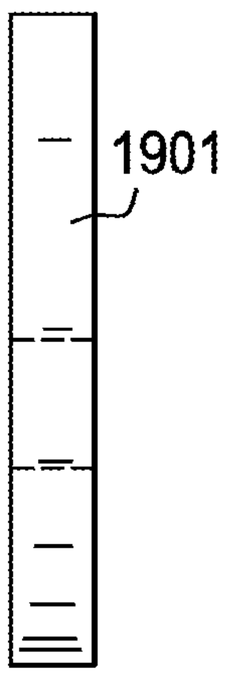


FIG. 19C



FIG. 20

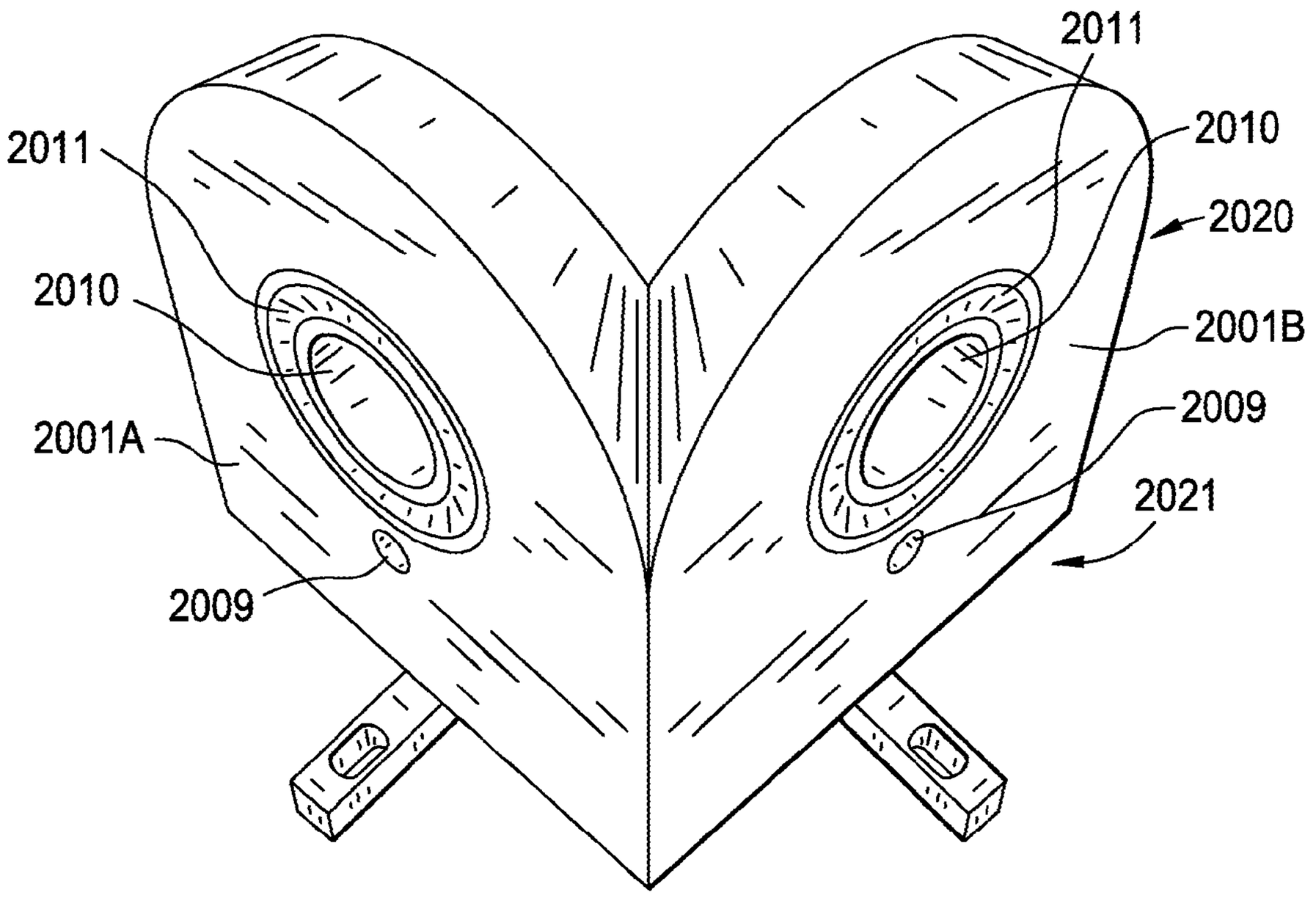
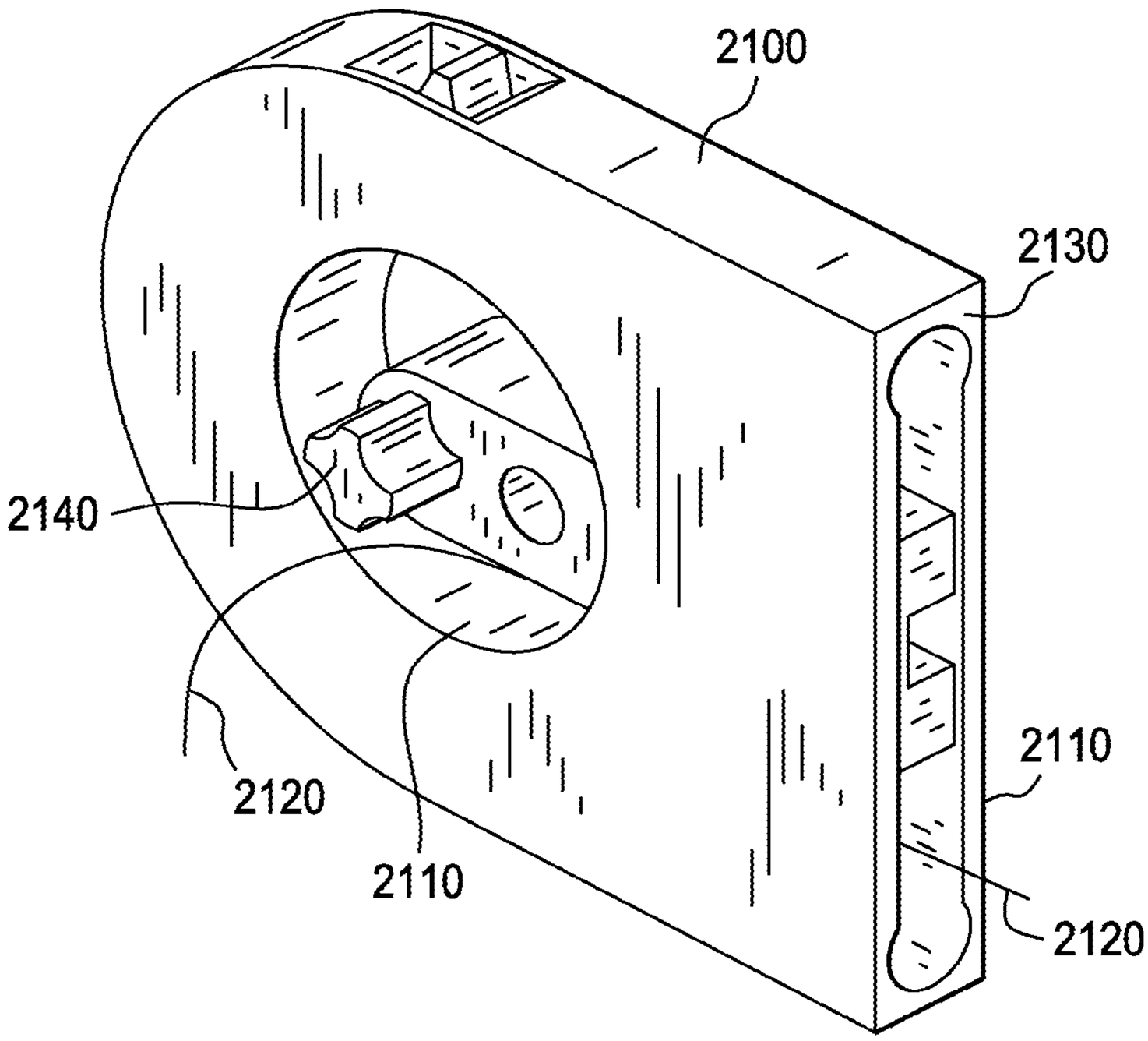


FIG. 21



ASSEMBLY FOR MOUNTING SHADES

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a U.S. national stage of and claims priority to and the benefit of International Application No. PCT/US2013/041175, entitled "Assembly for Mounting Shades," filed on May 15, 2013, which is incorporated herein by reference in its entirety.

FIELD

The present invention relates to fastening devices such as mounts, brackets, bracket assemblies, and mounting systems for the installation of motorized shades and shade systems.

BACKGROUND

Current brackets and mounts for roller window shades and shade systems are typically bulky, visible, and may detract from the aesthetics of the shade system. Hence, there remains a need for improved assembly for mounting shades and shade systems, including motorized shades.

SUMMARY OF THE INVENTION

The present embodiments provide for a system of fastening devices, e.g., mounts, brackets, and assemblies for installing roller window shades.

In one embodiment, the fastening device system comprises two one-piece, disk-shaped mounting brackets, one for each end of a shade tube, wherein the mounting brackets are configured such that, in use, the outer circumference of the brackets are visible; the mounting means being largely hidden within the bracket or by the shade. In a particular embodiment, the fastening system is designed for use with motorized shades, wherein one mounting bracket is configured to key the shade motor, and one mounting bracket is configured to receive the idler pin.

Another embodiment provides for a two-piece "invisible mount" fastening device comprising a mounting plate and a bracket, each configured to receive a means to secure the bracket to the mounting plate; and, optionally, a securing means. In use, the bracket surrounds the mounting plate, obscuring it from view. In one embodiment, the fastening device is configured to receive two ends of opposing shade tubes (i.e., a shade coupler). In another embodiment, the bracket is configured with a "key" projection. In yet another embodiment, the bracket is configured to receive an idler pin.

Yet another embodiment provides for a system for mounting at least two tube shades comprising the mounting bracket system (i.e., two disk-shaped mounting brackets) and at least one "invisible mount" two-piece shade coupler fastening device. In a particular embodiment, at least one of the shades is motorized.

Another embodiment provides for a system for mounting at least two tube shades, comprising at least three two-piece "invisible mount" fastening devices. In a particular embodiment, at least one of the shades is motorized and the system comprises a motor mount fastening device, a idler mount fastening device, and at least one shade coupler.

DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a view of an example fastening device having a mounting plate, a bracket, and a set screw. Dashed lines indicate the direction of screws used to secure the mounting plate to a flat surface (e.g., a window casing or wall).

FIG. **2** shows the example embodiment of FIG. **1**, with the bracket fitting over and around the mounting plate and the set screw inserted partially into the bracket.

FIG. **3** shows a view of the installed embodiment of FIG. **1**, wherein the outer circumference of the fastening device is visible, and the mounting plate is not visible, and the set screw is flush with the bracket.

FIGS. **4**A-C are three configurations of an embodiment of the bracket, mounting plate, and set screw embodiment, wherein the bracket is further configured as a Coupler, a Wall Mount Idler, or a Motor Wall Mount, respectively.

FIG. **5** presents a view of an alternative embodiment of the invention, in which the mounting plate slides into and is hidden within the bracket.

FIGS. **6**A-D show various views of a one-piece idler mount disk-shaped mounting bracket.

FIGS. **7**A-D show various views of a one-piece motor mount disk-shaped mounting bracket.

FIG. **8** shows the mounting brackets of FIG. **6** and FIG. **7** in use on a shade, depicted by dashed lines.

FIG. **9** is a perspective view of an embodiment of the fastening device configured as a Coupler, installed with two tube shades. Note that the set screw is obscured by the shade, leaving a clean, simple bracket in view.

FIG. **10** is a perspective view of a one-piece idler mount disk-shaped mounting bracket installed with a tube shade.

FIG. **11** is a depiction of two tube shades assembled with the fastening devices of some embodiments of the present invention.

FIG. **12**A is a top view of an idler mount according to an embodiment.

FIGS. **12**B-C are side and plan views, respectively, of the idler mount of FIG. **12**A according to an embodiment.

FIGS. **12**D-E are side and plan views, respectively, of the idler mount of FIG. **12**A according to another embodiment.

FIG. **13**A is a top view of a motor mount according to an embodiment.

FIGS. **13**B-C are side and plan views, respectively, of the motor mount of FIG. **13**A according to an embodiment.

FIGS. **13**D-E are side and plan views, respectively, of the motor mount of FIG. **13**A according to another embodiment.

FIG. **14**A is a top view of a dual idler mount according to an embodiment.

FIGS. **14**B-C are side and plan views, respectively, of the dual idler mount of FIG. **14**A according to an embodiment.

FIGS. **14**D-E are side and plan views, respectively, of the dual idler mount of FIG. **14**A according to another embodiment.

FIG. **15**A is a top view of a dual motor mount according to an embodiment.

FIGS. **15**B-C are side and plan views, respectively, of the dual motor mount of FIG. **15**A according to an embodiment.

FIGS. **15**D-E are side and plan views, respectively, of the dual motor mount of FIG. **15**A according to another embodiment.

FIGS. **16**A-C are top, side and plan views, respectively, of a fastening device according to an embodiment.

FIGS. **17**A-C are top, side and plan views, respectively, of a dual idler mount according to an embodiment.

FIGS. **18**A-C are top, side and plan views, respectively, of a dual motor mount according to an embodiment.

FIGS. **19**A-C are top, side and plan views, respectively, of a fastening device according to an embodiment.

FIG. **20** is a perspective view of a fastening device having brackets position at a 90 degree angle with respect to each other according to an embodiment.

FIG. **21** is a perspective view of a bracket having an opening therethrough according to an embodiment.

DETAILED DESCRIPTION

The present invention is not limited to the particular methodology, protocols, and expression of design elements, etc., described herein and as such may vary. The terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention, which is defined solely by the claims.

As used herein and in the claims, the singular forms include the plural reference and vice versa unless the context clearly indicates otherwise. The term "or" is inclusive unless modified, for example, by "either." For brevity and clarity, a particular quantity of an item may be described or shown while the actual quantity of the item may differ. Other than in the operating examples, or where otherwise indicated, all numbers expressing measurements used herein should be understood as modified in all instances by the term "about," allowing for ranges accepted in the art.

All patents and other publications identified are expressly incorporated herein by reference for the purpose of describing and disclosing, for example, the methodologies described in such publications that might be used in connection with the present invention. These publications are provided solely for their disclosure prior to the filing date of the present application. Nothing in this regard should be construed as an admission that the inventors are not entitled to antedate such disclosure by virtue of prior invention or for any other reason. All statements as to the date or representation as to the contents of these documents is based on the information available to the applicants and does not constitute any admission as to the correctness of the dates or contents of these documents.

Unless defined otherwise, all technical terms used herein have the same meaning as those commonly understood to one of ordinary skill in the art to which this invention pertains. Although any known methods, devices, and materials may be used in the practice or testing of the invention, the methods, devices, and materials in this regard are described herein.

Embodiments of the present invention provide for improved means for mounting window shades (roller shades), including motorized shades, in which the portion of the mounting means (i.e., the "mount", "mounting plate", or "mounting bracket") affixed to the supporting structure (e.g., the window casing, walls, columns, etc.) are hidden from view by the structure of the bracket or mounting bracket. In some embodiments, the mounting bracket is a one-piece, disk-shaped device, having recessed apertures to receive means to secure the mounting plate, and further configured either to connect to the shade motor or clutch; or to hold a shade idler pin or pin. The disk-shape is selected for aesthetic reasons: to harmonize visually with the round nature of the shade tube, but other shapes of mounting plates are possible.

Another embodiment of the invention provides for a bracket, a mounting plate, and, optionally, a connecting means, whereby the bracket and mounting plate are configured such that, in use, the bracket fits over the mounting plate, being secured together by a connecting means, such that the mounting plate is hidden by the bracket. Optionally, the connecting means can be positioned on the body of the bracket at a location that will be hidden by the shade tube. The connecting means that secures the bracket to the mounting plate can comprise a pin and cam assembly, a set screw, a rod and spring, etc., as will be illustrated further by non-limiting embodiments herein.

The fastening devices of embodiments of the present invention can be made of any material suitable for being manufactured and capable of bearing the weight of shades, such as motorized shades. Such materials include metals, metal alloys, ceramics, plastics, and the like. The fastening devices can be manufactured by conventional processes.

Reference will now be made in detail to embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

An example embodiment of a fastening device for securing roller window shades to the desired wall, window casing, and the like, is shown in FIG. **1**. The embodiment includes a bracket (**1**), mounting plate (**2**) and a set screw (**3**). The mounting plate (**2**) has one side or end adapted to abut a flat surface, and a peg (**6**) projects from the opposite side. The mounting plate (**2**) also bears two apertures (**5**) through which fastening means (e.g., screws) can be inserted as indicated by the dashed lines to secure the mounting plate to a flat surface. The peg (**6**) bears a screw bore (**7**) that passes through the entire peg, and has an internally threaded surface for receiving the set screw. The bracket (**1**) is configured with an opening (**8**) to receive the mounting plate (**2**), and is configured to abut a flat surface. The bracket (**1**) also bears a screw bore (**9**) that passes through the entire body (i.e., width) of the bracket, for receiving the set screw. In the particular embodiment shown in FIG. **1**, the bracket has an opening (**10**) for receiving one end of each of two opposing shade tubes, which tubes may interlock within the opening (**10**). The particular embodiment also has a bearing (**11**) within the opening (**10**), which allows the tubes to spin freely, minimizing friction and wear. Further regarding the bearing, this can be any appropriately sized commercially available bearing that, when the bracket is so configured, snaps into place. The bearing can be metal or ceramic, for example.

In use, the mounting plate (**2**) is secured to a flat surface using screws or other appropriate fastening means that are inserted through the apertures (**5**) in the mounting plate (**2**) in the direction indicated by the dashed lines of FIG. **1**. Once this the mounting plate (**2**) is secured, the bracket (**1**) is inserted over the mounting plate (**2**), such that the flat surfaces (**4**, **12**) align, and the screw bores (**7**, **9**) align. A view of this is shown in FIG. **2**, which also shows the set screw (**3**) partially inserted into the bracket (**1**) screw bore (**9**). Once the bracket (**1**) is in place, the set screw (**3**) is then secured through the bore holes (**7**, **9**) of the bracket (**1**) and peg (**6**). Note that the end (**12**) of the bracket and the flat surface (**4**) of the mounting plate align to create a flat surface that will evenly abut a complementary flat surface. Also note that, in this embodiment, the outer dimensions of the mounting plate (**2**) fit in the interior of the receiving portion (**8**) of the bracket (**1**) in hand-in-glove fashion. The length of the set screw (**3**) is about equal to the width of the bracket (**1**), such that when fully inserted, the set screw (**3**) joins the peg (**6**) with both sides of the bracket (**1**). and the set screw (**3**) has no protruding surfaces. Moreover, in this particular embodiment, the screw bore (**9**) is placed close to the opening (**10**) for the tube, such that when the shade tubes are inserted into the fastening device, the screw bore is hidden from view by the shade. Once this fastening device is mounted on the flat surface, the outer circumference (**13**) is visible from the side view; the mounting plate (**2**) being obscured from view. A perspective view of the embodiment

affixed to a horizontal, flat surface, is shown in FIG. **3**, which demonstrates that the mounting plate (**2**) is no longer visible once the bracket (**1**) is in place and secured with the set screw (**3**). See also FIG. **9**.

FIGS. **4**A-**4**C present three embodiments of the fastening device, in which the brackets have been configured to serve as a Coupler (see FIGS. **1**-**3**); or as a mount for the motor side of a motorized shade tube (Motor Wall Mount); or as a mount for the end of the tube opposite the motor (Wall Mount Idler). More specifically, the Motor Wall Mount includes a "keying portion" or "key" (**430**) that, in use, provides a structure against which the motor can torque. The Wall Mount Idler has a hole (**431**) into which an idler pin can fit. The means connecting the bracket to the mounting plate in these embodiments comprises a rod (**46**) that projects into the bracket, the rod including a groove (**47**) that receives a set screw. Alternatively, the rod can be configured as a pin to receive a set screw configured as a cam (i.e., a pin and cam or "knock down" assembly).

FIG. **5** presents an alternative fastening device in which the bracket (**51**) slides over the mounting plate (**52**). More specifically, mounting plate (**52**) has two apertures (**55**) through which means are inserted to secure the mounting plate (**52**) to a flat surface. The mounting plate (**52**) is configured to have flanged portion (**516**) that fits the complementary base (**517**) of the bracket (**51**). Thus, in use, after the mounting plate (**52**) is secured to a flat surface, the bracket (**51**) slides over the mounting plate (**52**), and hides it from view. The bracket (**51**) is further secured by a fastening means inserted through the slot (**518**).

The fastening device comprising a bracket that covers the mounting plate provides an aesthetically pleasing mount, in that the means securing the bracket to the structure arc invisible. Moreover, this device can be secured to vertical or horizontal spaces, thus providing elegant flexibility in window shade installations.

Another embodiment of the invention provides for a fastening device system for securing a motorized shade, in which the mounting bracket for each end of the shade tube is a single piece rather than a mount and bracket assembly. More specifically, FIG. **6** shows views of an idler mount disk-shaped mounting bracket (**620**) having one side (**621**) configured to bear against a flat surface and one side having a projection (**622**) having a bore (**623**) configured to receive an idler pin. The idler mount (**620**) further comprises two apertures (**655**) through which fastening means (e.g., screws) are inserted to secure the flat surface of the idler mount (**620**) to the appropriate flat surface Wall, window casing, etc. The apertures (**655**) are configured (i.e., recessed) such that, in use, the means affixing the mount to the wall (or casing, etc.) are not visible. Hence, in use, the outer circumference (**613**) of the idler mount is visible. See also FIG. **10**, FIG. **11**.

The fastening device system of this embodiment further comprises a motor mount disk-shaped mounting bracket having one side configured to bear against a flat surface and one side having a projection configured as a key to engage the motor. See FIG. **10**. More specifically, FIG. **7** shows views of a motor mount disk-shaped mounting bracket (**720**) having one side configured to bear against a flat surface (e.g., a wall, window casing) and one side (**721**) having a projection that provides a key (**740**) against which the shade motor can torque. The apertures (**755**) are configured (i.e., recessed) such that, in use, the means affixing the mount to the wall (or casing, etc.) are not visible. Hence, in use, the outer circumference (**713**) of the motor mount is visible. See also FIG. **11**.

This system is advantageous in window casings or between pillars, where the mounting bracket is secured to a vertical surface.

Another embodiment of the invention provides for another fastening device system for securing a motorized shade, in which the mounting bracket for each end of the shade tube is a single piece rather than a mount and bracket assembly. More specifically, FIGS. **12**A-E show views of an idler mount (**1220**). In the embodiment shown in FIGS. **12**B-C, the idler mount (**1220**) has one side configured to bear against a flat surface and one side (**1221**) having a projection (**1222**A) having a bore (**1223**) configured to receive an idler pin. In the embodiment shown in FIGS. **12**D-E, the idler mount (**1220**) has two sides having projections (**1222**A) and (**1222**B) having bores (**1223**) configured to receive an idler pin. The idler mount (**1220**) further comprises an aperture (**1255**) through which fastening means (e.g., screws) may be inserted. In one embodiment, the aperture (**1255**) is recessed so that the fastening means are not visible.

The fastening device system of this embodiment can further comprise a motor mount. More specifically, FIGS. **13**A-E show views of a motor mount (**1320**). In the embodiment shown in FIGS. **13**B-C, the motor mount (**1320**) has one side (**1321**) configured to bear against a flat surface and one side having a projection (**1322**A) configured as a key to engage a motor. In the embodiment shown in FIGS. **13**D-E, the motor mount (**1320**) has two sides having projections (**1322**A) and (**1322**B). The projections (**1322**A) and (**1322**B) provide keys against which shade motors can torque. Motor mount (**1320**) further comprises an aperture (**1355**) through which fastening means (e.g., screws) may be inserted. In one embodiment, aperture (**1355**) is recessed so that the fastening means are not visible.

According to one embodiment, dual idler mounts, motor mounts and/or mount and bracket assemblies can be provided for use with two shades. In addition, three or more shades can be fit with a single idler mount, motor mount and/or mount and bracket assembly constructed in a similar fashion as those shown and described above. FIGS. **14**A-E and **17**A-C show views of dual idler mounts. FIGS. **14**A-E show views of an idler mount (**1420**) in a vertical configuration, while FIGS. **17**A-C show views of an idler mount (**1720**) in a horizontal configuration. In the embodiment shown in FIGS. **14**B-C, the idler mount (**1420**) has one side (**1421**) configured to bear against a flat surface and one side having two projections (**1422**A) and (**1422**B), each having a bore configured to receive an idler pin (**1423**). In the embodiment shown in FIGS. **14**D-E and **17**B-C, the idler mount (**1420**) has two sides, each having two projections (**1422**A) and (**1422**B). Projections (**1422**A) and (**1422**B) each have a bore (**1423**) configured to receive and idler pin. The idler mounts (**1420**) and (**1720**) further comprise one or more apertures (**1455**) through which fastening means (e.g., screws) may be inserted. In one embodiment, the apertures (**1455**) are recessed so that the fastening means are not visible.

FIGS. **15**A-E and **18**A-C show views of dual motor mounts. FIGS. **15**A-E shows views of an motor mount (**1520**) in a vertical configuration, while FIGS. **18**A-C show views of a motor mount (**1820**) in a horizontal configuration. In the embodiment shown in FIGS. **15**B-C the motor mount (**1520**) has one side configured to bear against a flat surface (**1521**) and one side having projections (**1540**A) and (**1540**B) configured as keys to engage a motor. In the embodiment shown in FIGS. **150**-E, the motor mount (**1520**) has two sides having projections (**1540**A) and (**1540**B). The projections (**1540**A) and (**1540**B) provide keys against which shade motors can torque. Motor mounts (**1520**) and (**1820**) further comprise

one or more apertures (**1555**) through which fastening means (e.g., screws) may be inserted. In one embodiment, apertures (**1555**) are recessed so the fastening means are not visible.

FIGS. **16**A-C and **19**A-C show views of dual mount and bracket assemblies for securing window shades to a desired surface. FIGS. **16**A-C show views of a mount and bracket assembly (**1620**) in a vertical configuration, while FIGS. **19**A-C show views of a mount and bracket assembly (**1920**) in a horizontal configuration. Assemblies (**1620**) and (**1920**) include brackets (**1601**) and (**1901**), respectively, and mounting plates (not shown) within brackets (**1601**) and (**1901**) similar to mounting plate **2** of FIG. **1**. Brackets (**1601**) and (**1901**) are configured with openings to receive the mounting plates, and are configured to abut a flat surface. Brackets (**1601**) and (**1901**) bear one or more screw bores (**1609**) that pass through the entire body (i.e., width) of the bracket, for receiving a set screw through a corresponding screw bore in the mounting plate. Brackets (**1601**) and (**1901**) have openings (**1610**) for receiving one end of each of two opposing shade tubes, which tubes may interlock within the opening (**1610**). Each opening (**1610**) has a bearing (**1611**), which allows the tubes to spin freely, minimizing friction and wear.

FIG. **20** is a perspective view of still another dual mount and bracket assembly for securing window shades to a desired surface. In this embodiment, assembly (**2020**) comprises brackets (**2001**A) and (**2001**B), which are formed at a 90 degree angle with respect to each other for positioning in a coner, for example. Assembly (**2020**) further comprises mounting plates (not shown) within each of brackets (**2001**A) and (**2001**B), in a similar fashion as is shown and described with respect to mounting plate **2** of FIG. **1**. Brackets (**2001**A) and (**2001**B) are configured with openings to receive the mounting plates, and are configured to abut a flat surface (**2021**). Brackets (**2001**A) and (**2001**B) each bear a screw bore (**2009**) that passes through the entire body (i.e., width) of the bracket, for receiving a set screw through a corresponding screw bore in the mounting plate. Brackets (**2001**A) and (**2001**B) each have an opening (**2010**) for receiving one end of a shade tube. The shade tube may interlock within the openings (**2010**). Each opening (**2010**) has a bearing (**2011**), which allows the tube to spin freely, minimizing friction.

FIG. **21** is a perspective view of a bracket (**2100**) having an opening therethrough according to an embodiment. In some embodiments, the bracket (**2100**) can have an opening (**2110**) for a wiring (**2120**), and the opening (**2110**) can extend from a side (**2130**) of the bracket (**2100**) adapted to bear against a flat surface (such as a wall, not illustrated) to an area (**2140**) of the bracket adjacent to the roller window shade (not illustrated) to permit the wiring (**2120**) to pass from the flat surface through the opening in the bracket (**2100**) and to the roller window shade. As such, the bracket (**2100**) obscures the view of the wiring (**2120**). The wiring can, in some embodiments, be used to supply power to a motor for use with the roller window shade. The opening in the bracket for the wiring is not limited to the configuration shown in FIG. **21**, and can be provided in any bracket for mounting a window shade.

A further embodiment of the present invention provides for a fastening device system comprising the single-piece, disk shaped idler and motor mounts and the fastening device comprising the mounting plate and bracket. As shown in FIG. **11**, this system is useful when using two shade tubes, with the motor mount and idler mount at the outer ends of the two shades, and the fastening device configured as a coupler in between, maintain the connection of the two shades in communication with the motor. This embodiment can be adapted to secure a number of shades, by using the required number of coupler fastening devices.

In used, low voltage wiring is done behind the motor mounting bracket or motor bracket/mounting plate fastening device. A wire is brought through the window casing (or appropriate structure), then the mount or bracket located adjacent to the wire. The wire is strung to behind the far (hidden) corner of the bracket and connections made behind the bracket such that the wiring is covered by the bracket.

The fastening devices and systems of the present embodiments are also suitable for use with non-motorized window shades; the particular embodiment selected to complement the structure at the ends of the non-motorized shade tubes.

When the disk-shaped mounting brackets are installed in a window casing, there is little room for error because the disk is relatively thin. Hence, installers can use mock shade tubes to perfect the installation, then order shades to match the tube length. Once the shades arrive, the mock tubes are removed from the motor, the motor and idler are installed in the shade, and the installation completed.

The invention claimed is:

1. A fastening device for mounting a roller window shade, comprising:

a mounting plate having one side adapted to bear against a flat surface and a second side opposite the first side having a peg projecting therefrom, and two apertures configured to receive a fastener for securing the mounting plate disposed on either side of the peg, wherein a screw bore extends through the peg for receiving a set screw, and wherein the screw bore has an internally threaded surface;

a bracket having one end adapted to bear against the flat surface, wherein the bracket is configured to fit over the mounting plate and receive the peg, and wherein the bracket has a screw bore extending therethrough for receiving the set screw; and

wherein the set screw has a length equal to or less than the width of the bracket;

wherein the bracket and mounting plate are configured such that when the bracket is fitted over the mounting plate, the screw bores of the mounting plate peg and bracket are aligned to receive the set screw; and

wherein the mounting plate and bracket are configured such that when the mounting plate abuts the flat surface and the bracket is placed over the mounting plate, the bracket obscures the view of the mounting plate.

2. The fastening device of claim **1**, wherein the bracket has a receiving portion configured to receive an idler pin of a motorized shade tube.

3. The fastening device of claim **2**, wherein the fastening device is configured to mount at least two window shades, wherein at least one window shade is motorized, wherein the bracket has a key portion configured to engage a key of the motorized shade tube, wherein the bracket has a tube-receiving bore extending therethrough, and wherein the tube-receiving bore is configured to receive one end from each of two shade tubes.

4. The fastening device of claim **1**, wherein the bracket has a key portion configured to engage a key of a motorized shade tube.

5. The fastening device of claim **1**, wherein the bracket has a tube-receiving bore extending therethrough, wherein the tube-receiving bore is configured to receive one end from each of two shade tubes.

6. The fastening device of claim **5**, wherein the tube-receiving bore further comprises a bearing.

7. The fastening device of claim **1**, further comprising two screws configured to secure the mounting plate against the flat surface.

8. The fastening device of claim 1, wherein the bracket comprises an opening for wiring, wherein the opening extends from the side of the bracket adapted to bear against the flat surface to an area of the bracket adjacent to the roller window shade, and wherein the bracket obscures the view of the wiring.

9. A fastening device system for mounting a roller window shade, comprising:

two disk-shaped mounting brackets, each having one side configured to bear against a flat surface and one side having a projection configured to hold an end of a tube shade, wherein each of the mounting brackets have two recessed apertures therethrough constructed and arranged to receive a fastener to secure the mounting bracket to the flat surface;

wherein, when holding a window tube shade, the outer circumferences of each disk-shaped mounting bracket is visible and the fastener is obscured by the window tube shade; and

wherein the projection of at least one of the mounting brackets is configured as a key to engage a tube shade clutch or a tube shade motor.

10. The fastening device system of claim 9, wherein the projection of at least one of the mounting brackets is configured to receive a tube shade pin or a motorized tube shade idler pin.

11. The fastening device system of claim 9, wherein each of the mounting brackets further comprise a tube-receiving bore extending therethrough, wherein each of the tube-receiving bores are configured to receive one end from each of two tube shades.

12. A fastening device for mounting a roller window shade, comprising:

a mounting plate having one side adapted to bear against a flat surface and a second side opposite the first side having a projection therefrom, and two apertures configured to receive a fastener for securing the mounting plate to the flat surface, wherein the projection is configured to insert into a bracket and receive a connector;

a bracket having one end adapted to bear against the flat surface, wherein the bracket is configured to fit over the mounting plate and receive the projection from the mounting plate, and wherein the bracket further includes an aperture for receiving the connector;

wherein the connector connects the bracket to the mounting plate;

wherein the mounting plate and the bracket are configured such that when the mounting plate abuts the flat surface and the bracket is placed over the mounting plate, the bracket obscures the view of the mounting plate;

wherein the bracket is configured to key a shade tube;

wherein the bracket is configured to receive a pin from a shade tube; and

wherein the bracket is configured to receive one end from each of two opposing shade tubes.

13. The fastening device of claim 12, wherein the connector connecting the bracket to the mounting plate includes a set screw.

14. The fastening device of claim 12, wherein the fastening device is configured to mount at least two windows shades, and wherein at least one window shade is motorized.

15. A fastening device system for mounting a roller window shade, comprising:

two disk-shaped mounting brackets, each having one side configured to bear against a flat surface and one side having a projection configured to hold an end of a tube shade, wherein each of the mounting brackets have two recessed apertures therethrough constructed and arranged to receive a fastener to secure the mounting bracket to the flat surface;

wherein, when holding a window tube shade, the outer circumferences of each disk-shaped mounting bracket is visible and the fastener is obscured by the window tube shade; and

wherein the projection of at least one of the mounting brackets is configured to receive a tube shade pin or a motorized tube shade idler pin.

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