

LAMPHOLDER

The present invention relates to a shuttered safety
5 lampholder for a bayonet type bulb.

Shuttered lampholders are known from, for example,
French Patent No. 2403665. In this case removal of a bulb
from the lampholder causes a shutter to be placed in front
10 of live telescopic spring loaded contacts supported within
the housing. On bulb insertion apertures in the shutter
are moved into alignment with the contacts and the
contacts spring through the apertures into engagement with
the bulb electrodes.

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With the above arrangement it is possible for the
contacts to become embedded in the soft solder electrodes
of the bulb. This allows the contacts to extend further
through the shutter than intended such that they lock the
20 shutter against rotation and prevent bulb removal.

Furthermore, the apertures in the shutter are not covered
when a bulb is removed. Thus, it is possible for a child
to insert a wire or nail through the apertures to touch a
live contact. It is also quite easy for a child with the

aid of a nail to move the shutter to the "open" position to expose live contacts and to leave the lampholder in a highly dangerous condition.

5 One aim of the present invention is to provide an improved shuttered lampholder in which the contacts do not lock the shutter against rotation. The invention also aims to provide a shutter mechanism which will preferably automatically assume its closed position when a bulb is
10 not present. The invention also seeks to provide a lampholder in which all apertures in the shutter are closed on bulb removal.

Accordingly, in one aspect the present invention
15 provides a safety lampholder for a bayonet bulb, the lampholder comprising a housing defining slots at one end thereof to receive bayonet pins of an inserted bulb, resilient bulb engaging contacts for electrical connection to a power source to supply electricity to the bulb being
20 arranged within the housing and biased outwardly thereof, the contacts having ramp formations at their respective free ends, rotatable apertured shutter means being located within the housing for selectively obstructing access to the contacts and arranged so as to be actuatable upon

insertion and removal of a bulb, the shutter means being arranged such that both axial and rotational insertion of a bulb actuates displacement of the shutter means against the bias of the contacts between a first inoperative
5 position in which the shutter means obstruct the contacts and the contacts are offset from the shutter apertures, and a second operative position in which the free ends of the contacts extend through the apertures in the shutter means to bear against an inserted bulb, and both axial and
10 rotational removal of a bulb actuates rotation of the shutter means which is effective to drive the contacts inwardly of the housing and against the bias of the contacts to the first inoperative position by interengagement of the shutter means with ramp formations
15 on the contacts.

Preferably the lampholder housing slots each comprise an inclined longitudinal portion and a circumferential portion. Most preferably the shutter means extends to the
20 housing slots and includes inclined longitudinal surfaces which extend away from the housing slots. In this respect, such housing slots and shutter surfaces are arranged such that axial insertion of a bulb into the lampholder, in which the bayonet pins travel along the

inclined longitudinal portions of the housing slots, effects rotation of the shutter means. In this way, a housing slot and shutter means surface may present a scissor formation which provides that, as a bayonet pin is
5 inserted between the housing slot and shutter surface, a considerable degree of rotation of the shutter means is achieved for a given axial movement of the bayonet pin.

Suitably, the bulb engaging contacts in the present
10 lampholder comprise cylinders of an electrically conductible material, the cylinders being of generally arcuate form in cross-section, having a first dimension greater than a second dimension. Typically, such contacts are arranged with their respective first dimensions
15 circumferentially spaced about the axis of rotation of the shutter means. Preferably the first dimension of a contact cylinder decreases along a length of the cylinder at the free end of a contact to define the ramp formation. Typically a ramp formation comprises an inclined slope.

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In this respect the combination of ramp surfaces on the contacts with the scissor formations provided by the housing slots and shutter means surfaces is preferred in that it can effect both considerable rotation of the

shutter means and axial displacement of the contacts. This has various advantages. The scissor formations effectively increase the extent of rotation effected for a given extent of axial insertion of a bulb. This in turn means that the shutter means is capable of undergoing a degree of rotation sufficient to open relatively large apertures which thus, may receive relatively wide contacts. Contacts which are relatively wide at their open ends may also provide relatively steep ramp surfaces at their free ends whilst retaining a free end of sufficient width to effect a reasonable electrical connection with an inserted bulb. The use of steep ramp surfaces has various other advantages including, in particular, facilitating withdrawal of the contacts behind the shutter means upon bulb removal. This is an advantageous feature of embodiments of this invention as compared to the prior art lampholders. In many prior lampholders difficulties remain in drawing the contacts back through the shutter apertures upon bulb removal.

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In preferred embodiments, recesses are provided in the shutter means alongside the apertures in the shutter means, and the recesses are arranged to accommodate the free ends of the contacts when the lampholder is in the

first inoperative position, so as to inhibit rotation of the shutter means in the absence of a bulb. The resilient contacts are typically loaded against the recesses in the shutter means.

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Preferably ramps are provided on the shutter means for assisting withdrawal of the contacts back behind the shutter means upon bulb removal. In this respect, suitably an aperture in the shutter means has a wall of
10 ramp form arranged for interengagement with a ramp formation of a contact to assist in driving the contact inwardly of the housing.

It is also preferable for the contacts to be arranged
15 so that, in the second operative position, the ramp formations at the free ends of the contacts do not extend completely through the apertures in the shutter, again to facilitate their withdrawal behind the shutter on bulb removal.

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In particularly preferred embodiments of the present invention, means are provided for rotationally biasing the shutter means to the closed position. This is an advantageous safety feature to make it more difficult to

tamper with the shutter means to expose the contacts.

In this regard preferably an axially movable member is located in the housing and biased outwardly thereof, 5 the axially movable member being arranged to engage the shutter means to rotationally bias the shutter means to the first inoperative position. Most preferably the axially movable member and shutter means have interengageable surface formations arranged such that 10 rotation of the shutter means drives axial displacement of the axially movable member.

It is also particularly preferred that the axially movable member and shutter means have interengagable 15 surface formations in the form of ramps. Suitably the axially movable member is biased outwardly of the lampholder housing, perhaps by a compression spring or the like. In this respect, use of an axially movable member which is biased axially outwardly of the lampholder 20 housing to effect a rotational bias to the shutter means is advantageous as compared to use of a torsion spring to provide the rotational bias. Such torsion springs may prove difficult to mount in the desired location.

It is also desirable to provide formations in the housing to overlie the shutter apertures when the shutter means is in the inoperative position. The is to make tampering more difficult. Thus, in preferred embodiments

5 surface formations in the housing are arranged to extend into apertures in the shutter means so as to shield the contacts from the apertures in the shutter means when the lampholder is in the first inoperative position. In embodiments which employ an axially movable member,

10 preferably the axially movable member has surface formations which extend into the apertures in the shutter means. In other embodiments the surface formations may be provided by other components in the lampholder, such as by the terminal block, for example.

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Embodiments of the present invention will now be described further, by way of example, with reference to the accompanying drawings, in which:

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Figs. 1 to 4 are cross-sectional views of an assembled lampholder according to a first embodiment of the invention;

Fig. 1 illustrates the position of the components

prior to bulb insertion, Fig. 2 after partial axial insertion, Fig. 3 after full axial insertion and Fig. 4 when a bulb has been fully inserted.

5 Fig. 5 is a perspective view of the housing of the lampholder of Fig. 1.

 Figs. 6 to 8 are views of the terminal block of Fig. 1; Fig. 6 is a perspective view and Figs. 7 and 8 are
10 cross-sectional views.

 Figs. 9 and 10 are views of the shutter member of Fig. 1; Fig. 9 is a cross-sectional view and Fig. 10 is a perspective view.

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 Figs. 11 and 12 are views of the contact support plate of Fig. 1; Fig. 11 is a perspective view and Fig. 12 is a plan view.

20 Figs. 13A to 13D show enlarged cross-sectional schematic views illustrating the relationship between the shutter, contacts and support plate at the various stages of bulb insertion.

Figs. 14A to 14D show enlarged views illustrating the relationship between the housing slots, bayonet pins and shutter surfaces at the various stages of bulb insertion.

5 Fig. 15 is a cross-sectional view of an assembled lampholder according to a second embodiment of the present invention and illustrates the position of the components prior to bulb insertion.

10 Figs. 16 & 17 are views of the housing of Fig. 15; Fig. 16 is a cross-sectional view and Fig. 17 is a perspective view.

Fig. 18 is a plan view of the assembled lampholder of
15 Fig. 15 prior to the cover being secured thereto and when only one resilient terminal contact has been fixed in the terminal block.

Figs. 19 and 20 are views of a lampholder according
20 to a third embodiment of the invention illustrating the lampholder of Figs. 1 to 14 modified to incorporate a transverse switchbar; Fig. 19 is a perspective view and Fig. 20 is a cross-sectional view showing the position of the components prior to bulb insertion and when the

switchbar is in the "off" position.

Figs. 21 to 23 are cross-sectional views of an assembled lampholder according to a fourth embodiment of the present invention; Fig. 21 illustrates the position of the components prior to bulb insertion, Fig. 22 after axial insertion of a bulb and Fig. 23 when a bulb has been fully inserted.

Figs. 24A to 24C illustrate enlarged cross-sectional views showing the relationship between the shutter, terminal contacts and terminal block of the embodiment of Figs. 21 to 23, at the various stages of bulb insertion.

Fig. 25 is an enlarged view showing the relationship between the housing slots, bayonet pins and shutter surfaces of the embodiment of Figs. 21 to 23 at the various stages of bulb insertion.

Figs. 26 and 27 are enlarged cross-sectional views showing the relationship between the shutter, terminal contacts and terminal block of a further embodiment of the invention at various stages of bulb insertion.

Fig. 28 is a part cross-sectional view of the bulb receiving end of a housing which would support the bayonet pins of the bulb, on the inner and outer wall sections when said bulb was at rest in the holding recesses in the
5 housing slots.

Figs. 30 to 33, 35 and 36 illustrate a further embodiment of the invention, similar to the Fig. 23 embodiment; and

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Fig. 34 illustrates a yet further embodiment.

Referring now to Figs. 1 to 14, they illustrate a shuttered lampholder according to a first embodiment of
15 the present invention. The lampholder comprises a generally hollow cylindrical housing 400 into one end of which can be received the cap of a bayonet type bulb. The housing is provided with the slots 401 to receive the bayonet pins 550 of an inserted bulb. The slots 401 each
20 comprise an inclined longitudinal portion 402 and a circumferential portion 403 and are each provided with a recess 404 to retain the bulb in its operating position.

The housing 400 is also provided with a screw thread

407 to retain a shade locking ring (not shown). A locking ring is also typically provided to secure a cover to the housing 400. The cover provides an entry port for the power supply flex and acts to cover the screw terminals
5 470.

Cutouts 410 are defined in the housing wall to prevent rotation of the terminal block 430 relative to the housing 400. Flexible finger members 413 are also
10 provided in the housing wall and in use are moved into engagement with the terminal block 430 to render it captive.

Annular support ledges are provided internally in the
15 housing 400. The bulb receiving end of the housing 400 is turned inwards locally to provide a cavity wall section. The deflected inner wall 405 acts to centralise the shutter in the housing 400 it also makes the open end of the housing much stronger and resistant to distortion.
20 This is discussed in more detail below.

Suitably, the end of the housing 400 opposite the bulb receiving end is closed by a terminal block 430 which is fixedly secured therein by means of the flexible

members 413, with its annular step 432 supported by the housing wall. The terminal block 430 supports a pair of fixed flex engaging terminals 470 which extend through said terminal block so as to be accessible on opposite
5 sides thereof. A central stepped bore 438 is also provided in the terminal block 430 to house a compression spring 540. In use, the spring 540 acts to bias the support plate 500 and thereby the shutter 480 outwards of the housing 400 and the shutter rotationally to its first
10 "closed" position. The support plate 500 corresponds to an axially movable member and, again, is discussed in more detail below.

Stop limbs 440 are defined on and depend from the
15 periphery of the surface of the terminal block facing the shutter 480. In use, the limbs 440 engage the vertical stops 489 extending from the inner surface of the shutter 480. The stops provide that, before the shutter 480 can move inwards of the housing 400 from its "closed" to its
20 "open" position, it must first initially execute a turning movement within the housing 400 to move the shutter stops 489 clear of the terminal block stops 440. Stepped formations 448 in the terminal block 430 engage the cutouts 410 in the housing wall and act to prevent

relative rotation of the housing 400 and terminal block 430. The stepped formations 449 in the terminal block 430 also engage cutouts in the cover 570 to prevent relative rotation. An electrical flex restraint 447 is defined on
5 he outer surface of the terminal block 430.

A pair of limbs 434 extend from the inner surface of the terminal block 430 adjacent its periphery. The limbs 434 are provided with ledges 435 to support the contact
10 support plate 500. The limbs 434 engage guides 508 in the support plate 500 to prevent relative rotation. A pair of lugs 444 extend outwardly from the limbs 434 and, in use, are engaged by the flexible members 413 on the housing 400 to retain the terminal block therein. The limbs 434 may
15 also act to limit inwards movement of the shutter in the housing 400.

The shutter 480, which locates in the bulb receiving end of the housing 400, comprises a body portion 481
20 having an annular skirt 482 extending outwardly therefrom to adjacent the open end of the housing 400. The end of skirt 482 locates behind the deflected inner wall 405 in the housing 400. The skirt 482 is also provided with inclined surfaces 484 and 485. In use, the inclined

surfaces 484 extend across the inclined portions 402 of the respective housing slots 401 and provide that, as a bulb is pushed into the lampholder, the bayonet pins 550 of the bulb engage the scissor formations which the
5 surfaces 402 and 484 present. As the pins slide down the inclined surfaces 402 and 484 the shutter 480 is caused to rotate within the housing 400. The limbs 489 rotate around the stops 440 in the terminal block 480 thus unlocking the shutter 480 to be moved axially within the
10 housing 400.

A pair of spaced arcuate apertures 491 are provided in the surface of the shutter 480 and recesses 492 are defined adjacent and radially to one end of each aperture
15 491. A ramp formation 496 is also provided adjacent the other end of each aperture 491. The ramps 496 are inclined radially from a point adjacent the outer surface of the shutter 480 and extend inwardly of the lampholder from the inner surface of the shutter 480 (ref Figs. 9, 10
20 and 13). In use the ramps 496 interengage ramps 506 on the support plate 500 to provide the automatic biasing means of the shutter mechanism.

The shutter 480 is also provided with a centralising

peg 490 and a pair of vertical stop limbs 487 which extend from the periphery of the surface of the shutter 480 facing the terminal block 430. Partial, axial insertion of a bulb is required in order to move the stop limbs 487 clear of the stops 440 in the terminal block 480 to unlock the shutter to be moved axially inwards of the housing 400 to the position illustrated in Figs. 2, 13B and 14B.

The contact support plate 500 is located in the housing 400 in the gap between the terminal block 430 and shutter 480. The contact support plate 500 comprises a generally flat rectangular body 501 and is provided with a pair of spaced, arcuate contact receiving apertures 503 which match the profile of the contacts 520. The support plate 500 also has a central aperture 504 to receive the centralising peg 490 on the shutter 480. A pair of arcuate/radial ramps 505 are defined in and depend from the surface of the support plate 500 facing the shutter 480. In use the inclined surfaces 506 of the ramps 505 interengage the inclined surfaces 497 of the shutter ramps 496.

Prior to bulb insertion the portions of the ramps 505 which extend past the outer surface of the support plate

500 nest within the arcuate apertures 491 in the shutter 480. This effectively closes off the shutter apertures 491. The angled faces 498 and 507 on the shutter and plate respectively abut and overlap to ensure the contacts 5 520 are fully shuttered and not visible when a bulb is removed from the lampholder. This is illustrated in Fig. 13.

A lug 509 is provided at each end of the support 10 plate 500. The lugs 509 engage the respective limbs 434 of the terminal block 430 by locating on the support ledges 435. The support plate 500 is thus held captive in the terminal block 430 but free to be moved axially relative to said terminal block 430 by lugs 509 moving 15 within the guide slots 443. Guide ribs 511 further support the plate 500 as it is moved axially relative to the terminal block.

The interengagement of the respective inclined ramp 20 faces 497 and 506 provides that rotational movement imparted to the shutter 480 during the various stages of bulb insertion is converted into relative axial movement of the support plate 500 inwards of the housing 400.

A central compression spring 540 is arranged to act between the terminal block 430 and support plate 500. One end of the spring 540 locates in the stepped bore 438 in the terminal block, with the other end of the spring 540 abutting the inner surface 501 of the support plate 500. The spring 540 ensures that the inclined ramp surfaces 497 and 506 remain in engagement. Thus the spring 540 acts to bias the support plate 500 outwards of the housing 400 and against the ledges 435 in the terminal block, and also to bias the shutter 480 outwards of the housing 400 and rotationally to its first "closed" position.

The bulb engaging contacts 520 are best illustrated in Fig. 13. The contacts 520 are preferably hollow and arcuate in cross-section so as to be a snug fit in the arcuate apertures 503 in the support plate 500. The open end of each contact 520 may be provided with a flared end or shoulder 524 which, in use, may limit the extent to which the contacts 520 are allowed to protrude past the outer surface of the shutter 480 by their engagement with the inner surface 501 of the support plate 500. The closed (or free) end of each contact 520 which, in use, engages the bulb electrodes, defines an angled/inclined ramp formation 522. In use as discussed below, on bulb

removal, a contact ramp formation 522 is engaged by the ramp formation 498 defined adjacent one end of the shutter apertures 491. The ramps 498 thus effectively force the contacts 520 back through the apertures 491 to relocate
5 the ends 523 of the contacts 520 in recesses 492 behind the shutter 480 (ref Figs. 13).

Bridging springs 530 in conventional manner provide an electrical connection (resilient) between the bulb
10 engaging contacts 520 and flex terminals 470. One end of each spring 530 locates within the hollow contact 520 and the other end of each spring preferably locates within a bore 473 in the flex terminal 470. Alternatively, that end of the spring 530 may simply abut the flex terminal
15 470 and be supported in a bore in the terminal block 430.

In use, when the lampholder of Figs. 1 to 14 is assembled and with no bulb present, the lampholder components assume the position illustrated in Figs. 1, 13A
20 and 14A. The inclined surfaces 484 of the shutter 480 extend across the inclined longitudinal portion 402 of the housing slots 401. The contacts 520 are located behind the shutter 480 which is biased to its "closed" position by the support plate 500 by means of the interengagement

of the ramp surfaces 497 and 506 respectively. The support plate 500 is located on the support ledges 435 in the terminal block 430. The arcuate apertures 491 in the shutter 480 are non-aligned with the arcuate apertures 503 in the support plate 500 and the contacts 520. The apertures 491 in the shutter 480 are closed by the ramp formations 505 and the shutter is supported by the inner housing wall 405. The stops 489 on the shutter 480 abut the stop limbs 440 in the terminal block 430.

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Insertion of a bulb is done in three stages, a first axial stage, a second axial stage and a rotational stage. In a first axial stage, as a bulb is inserted into the lampholder the bayonet pins 550 engage the respective scissor formations presented by the inclined housing slots and shutter surfaces 484. As the bulb is moved axially inwards of the lampholder the shutter 480 is caused to rotate in an amplified manner and the stops 489 rotate clear of the stops 440. This unlocks the shutter 480 to be moved inwards of the housing 400. The rotation of the shutter 480 drives relative axial displacement of the support plate 500 inwards of the housing 400 against the force of the spring 540 and partially aligns the contacts 520 with the shutter apertures 491. The lampholder

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components now assume the position illustrated in Fig. 2, 13B and 14B after this first stage of axial bulb insertion.

5 In a second stage of axial bulb insertion, as the bulb is moved fully axially into the lampholder, the pad electrodes on the end of the bulb are preferably abutting the outer surface of the shutter 480. This may move the shutter 480 angularly inwards of the housing 400 as the bayonet pins move along the inclined slots 402. This action causes the shutter 480 to depress and fully load the contacts 520 which have started to slide through the apertures 491. The angular movement imparted to the shutter 480 also causes the plate 500 to be moved further inwards of the housing 400 relative to the shutter 480. The lampholder components assume the position best illustrated in Figs. 3, 13C and 14C after this second stage of axial bulb insertion.

20 Rotating the bulb in the lampholder causes the shutter 480 to rotate with it to its fully "open" position. It also causes the contacts 520 to slide via their ramp formations 522 down the inclined faces 498, with the ends 523 of the contacts 520 extending through

respective apertures 491 in the shutter 480 to engage and energise the electrodes of the inserted bulb. The lampholder components assume the position illustrated in Figs. 4, 13D and 14D when a bulb has been fully inserted.

- 5 At this stage the bayonet pins 550 have located in the holding recesses 404 at the end of the horizontal portion 403 of the housing slots 401.

On bulb removal, as the shutter 480 is rotated from
10 its "open" back to its "closed" position, the ramp faces 498 of the apertures 491 engage respective ramp faces 522 of the contacts 520 to drive the contacts 520 inwards of the housing 400, back through the apertures 491 in the shutter 480. Simultaneously, the support plate 500 is
15 moved outwards of the housing 400 by the loaded spring 540 and the ramps 505 are moved to nest within the respective apertures 491 as the contacts 520 relocate in their first position, with their ends 523 positioned behind the shutter 480 in the recesses 492. The shutter 480 thus
20 assumes its first "closed" position (ref Figs. 1, 13A and 14A). On bulb removal the bayonet pins 550 drive the shutter 480 by engagement with the vertical surfaces 485 on the shutter 480.

All rotation or angular movement imparted to the shutter 480 during the various stages of bulb insertion drives relative axial movement of the support plate 500 inwards of the housing 400 due to the interengagement of
5 the pairs of ramps 496 and 505 on the shutter 480 and plate 500 respectively.

Although the interengagement of the ramps 496 and 505 and spring 540 act to bias the shutter 480 rotationally to
10 its "closed" position, it is possible that a spring will be incorporated which will directly bias the shutter 480 rotationally to its "closed" position, for example, anchoring one leg of the spring in the terminal block 430 and engaging the other leg of the spring on the face 488
15 of the stop limb 489 on the shutter 480.

Preferably, the shutter 480 is fabricated from thermoplastic material. However, it should be noted that the annular skirt 482 of the shutter 480 (which defines
20 the surfaces 484 and 485) may comprise a separate component in the form of a metal sleeve which defines the surfaces 484 and 485. Such a metal sleeve member would be secured in fixed relation to the shutter body. An example of such an arrangement is illustrated in Fig. 15.

Referring now to Figs. 15 to 18, there is illustrated a second embodiment of the present invention. In this example the resilient terminal contacts are mounted in a terminal block 630, each terminal contact comprising a flex engaging terminal 670, a bulb engaging contact 720 and a bridging spring 674. As with the previous embodiment the bulb engaging contacts 720 are generally tubular, of arcuate cross-section and their closed end 723 defines a ramp formation 722. The open end of each contact 720 is provided with a broken shoulder or flare 724 by means of which they are retained in the terminal block 630 supported by the step 649 in the bore 648. The stepped bores 648 are arcuate and match the cross-section of the contacts 720.

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One end of a bridging spring 674 locates within the hollow contact 720 and the other end locates within a bore 671 in the terminal 670. Each terminal 670 is a snap-engaging fit in the terminal block 630 by means of a pair of hook members 646 which depend from the inner surface of the terminal block 630. In assembly the terminal 670 is forced between the hook members 646 until the undercuts 646A spring into engagement with the top surface of the terminal 670, to retain the terminal 670, the bridging

spring 674 and bulb engaging contact 720 captive in the terminal block 630.

The axially movable support plate 700 of this
5 embodiment is identical to that of Figs. 1 to 14 and is
provided with arcuate contact receiving apertures 703, a
central aperture 704 and a pair of arcuate/radial auto
return ramps to interengage the ramps defined on and in
the inner surface of the shutter 680. The support plate
10 700 is mounted in the terminal block 630 and supported by
its lugs 709 engaging on the ledges 635 in the terminal
block limbs 634. The support plate 700 is arranged to
move axially only, within and relative to the terminal
block 630 and housing 600.

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The housing 600 of this embodiment, as illustrated in
Figs. 16 and 17, is provided with slots 601 at its bulb
receiving end, the longitudinal portion 602 of the slots
601 being inclined. A screw thread 600 is provided to
20 retain a shade locking ring and the open end of the
housing is fabricated to define an inner wall 605. In use
the end of the annular shutter skirt 688 locates behind
the wall 605 which acts to shield the shutter skirt and
its surfaces 689 and 690 and to centralise the shutter 680

in the housing 600. Support ledges 610 are defined internally in the housing wall to support the terminal block 630 and annular ribs 617 are provided adjacent the end of the housing 600 opposite the bulb receiving end.

5 The ribs 617 retain the terminal block 630 in the housing 600 by snap-engagement. A pair of vertical flat surfaces 619 engage flat surfaces 650 on the terminal block 630 to prevent relative rotation.

10 The housing is further provided with a plain band 608 adjacent its closed end which defines a pair of cutouts 614 to locate the clips of a clip-on cover (not shown). Hooks on the cover clips engage undercuts 615. The cover is thus supported on the ledge 613 in the housing wall.

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The shutter 680 in this embodiment comprises two separate components (as previously mentioned), a body part and an annular skirt part. The body part 681 of the shutter 680 is fabricated from a thermoplastic material
20 and the annular skirt part 688 is in the form of a metal sleeve. The metal sleeve 688 is fixedly secured to the shutter body part 681. The sleeve 688 defines the shutter surfaces 689 and 690. The shutter surfaces 684 in use interact with the inclined longitudinal portion 602 of the

housing slots 601 in the first stage of axial bulb insertion to greatly amplify rotation of the shutter 680 relative to the housing 600.

5 In this embodiment the central peg 690 extending from the inner surface of the shutter 680 is provided with an annular bead 691 adjacent its free end. The bead 691 is a force fit in a stepped aperture 637 in the terminal block 630 and acts to captivate the shutter 680 in the terminal
10 block 630 by its engagement with the step 638. This leaves the shutter 680 free to rotate and move axially relative to the housing 600 and terminal block 630. Thus a sub-assembly comprising the terminal block 630, support plate 700 and shutter 680 may be assembled in the housing
15 600 as one unit. The resilient terminal contacts may be loaded into the terminal block 630 either before or after said sub-assembly is mounted in the housing 600.

For a lampholder of Figs. 15 to 18 assembled and with
20 no bulb present, the components assume the position illustrated in Fig. 15, analogous to Fig. 13A and 14A). The inclined surfaces 689 of the shutter 680 extend across the inclined axial portion 602 of the housing slots 601. The contacts 720 are supported in the terminal block 630

and biased outwards of the housing 600 by the springs 674 against support ledges 649. The contacts 720 extend through the arcuate apertures 703 in the support plate 700, and the ends 723 of the contacts 720 locate behind the shutter 680 in the recesses 692. The shutter 680 is biased to its "closed" position by the support plate 700 which is biased outwards of the housing 600 by the loaded spring 675. The interengagement of the pairs of arcuate ramps on the shutter 680 and plate 700 act to rotationally bias/urge the shutter to its closed position.

The support plate 700 is supported on ledges 635 in the terminal block 630 and the arcuate apertures 691 in the shutter 680 are non-aligned with the arcuate apertures 703 in the support plate 700.

The apertures 691 in the shutter 680 are closed by the ramp formations 705 on the plate 700 and the shutter 680 is supported in the terminal block 630 by the annular bead 691 which is engaging the step 638 in the bore 637. The vertical stops 689 on the shutter 680 abut the stop limbs 640 on the terminal block 630 and the live bulb engaging contacts 720 are inaccessible and not visible behind the shutter 680.

It should be noted that the operation and function of the shutter means in this embodiment is identical to that of Figs. 1 to 14 and therefore requires no further explanation.

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Referring now to Fig. 18, this is a plan view of the assembled lampholder of Fig. 15 prior to the cover being secured and when only one resilient terminal contact has been secured in the terminal block 630. Clearly
10 illustrated are the flexible/resilient hooks 646 which act to retain the terminal assembly captive in the terminal block 630. This is by way of the engagement of the hooks 646A with the top surface of the terminals 670. The peg 690 with its annular bead 691 can be seen in the stepped
15 bore 637 engaging the step 638. Also visible are the lugs 709 of the support plate 700. The lugs 709 are supported on the ledges 635 in the terminal block limbs 634.

An electrical flex restraint 647 extends from the
20 inner surface of the terminal block 630. A pair of vertical limbs 636 are also defined on and extend from the periphery of the surface of the shutter 680 facing the cover. In use, the limbs 636 engage the inner surface of the cover to ensure the terminal block 630 cannot move

axially with respect to the housing 600. Although the annular ribs 617 which retain the terminal block 630 in the housing 600 by snap-engagement are generally considered to be adequate, the limbs 636 are in addition.

- 5 The engagement of the vertical surfaces 619 and 650 respectively on the housing 600 and terminal block 630 act to prevent relative rotation.

Figs. 19 and 20 are views of a lampholder of the
10 embodiments of Figs. 1 to 14 which has been modified to incorporate a transverse switchbar 850. The switchbar as is conventional, supports a pair of bridging contacts 860 which are connected via bridging springs 930 to the bulb engaging contacts 920. The switchbar 850 is movable
15 transversely relative to the housing 800 between an "off" position in which the bridging contacts 860 are spaced from the live flex terminals 870 in the terminal block 830 and an "on" position in which the bridging contacts 860 are moved to electrically connect with the live flex
20 terminals 870 to energise the bulb engaging contacts 920 via the springs 930.

The switchbar 850 comprises a body portion 851 provided with a pair of limbs 856 which extend externally

of the housing to be accessible to a user. The body portion 851 defines a central elongated aperture 852 and a pair of spaced apertures 853 to receive the bridging contacts 860. The elongated aperture 852 allows the
5 switchbar 850 to be moved transversely of the housing 800 relative to the spring 950 which passes through the aperture 852 to locate in the terminal block 830.

The switchbar 850 is slidably mounted in a guide slot
10 839 in a switch housing 838 defined in the terminal block 830. The switchbar 850 is also positioned in the housing 800 in the gap between the terminal block 830 and support plate 900. The limbs 856 extend externally of the housing through cutouts 943 in the cover 940.

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Fig. 19 is a perspective view of the manually switchable lampholder and clearly illustrates the switchbar 850 in position with its limbs 856 projecting externally of the housing 800 through the cutouts 943 in
20 the cover 940. The switch housing 838 on the terminal block 830 extends slightly past the outer surface of the cover 940 through cutouts 943 and the switchbar 856 is located in the guide slot 839.

A threaded locking ring 880 is provided to secure the cover 940 to the housing 800 by engagement with the thread 942. The relationship between the shutter surfaces 884 and the inclined portion 882 of the housing slots 801 can be more clearly seen in this view which illustrates the shutter 880 in its "closed" position.

When the lampholder of Figs. 19 and 20 is assembled with no bulb present the components assume the position illustrated in Figs. 19 and 20, (analogous to 13A and 14A). The inclined surfaces 884 of the shutter 880 extend across the inclined longitudinal portion 802 of the housing slots 801. The switchbar 850 is in its "off" position, holding the bridging contacts 860 in spaced relationship from the live flex terminals 870 in the terminal block 830. The springs 930 resiliently connect the contacts 860 and 920 to very lightly bias the contacts 920 outwards of the housing 800. The contacts 920 are also supported by plate 900 which is biased outwards of the housing by the spring 950. The ends 922 of the contacts 920 are located and lightly loaded in the recesses 892 adjacent the shutter apertures 891 and the shutter 880 is biased to its "closed" position by the support plate 900. The arcuate apertures 891 in the

shutter 880 are non-aligned with the arcuate apertures 903 in the support plate 900 and the vertical stops 889 on the shutter 880 are abutting the stop limbs 840 in the terminal block 830. The live bulb engaging contacts 920
5 are inaccessible and not visible behind the shutter 880.

Referring now to Figs. 21 to 25, there is illustrated a fourth embodiment of the invention in which the support plate member and central biasing spring have been omitted.
10 The lampholder of this embodiment does not provide the automatic return mechanism. However, the terminal contacts will be inaccessible and not visible when a bulb is removed and the contacts cannot lock the shutter against rotation and thereby the bulb in the lampholder.
15 Also, this embodiment requires fewer components than previous embodiments and, as such, may be more economical to construct.

The illustrated lampholder comprises a generally
20 hollow tubular housing 1000 provided with slots 1002 to receive the pins 1050 of an inserted bulb. The slots 1002 comprise an inclined longitudinal portion 1003 and a circumferential portion 1004 provided with a holding recess 1005 to retain a bulb in position. A screw thread

may be defined externally on the housing 1000 to retain a shade locking ring (not shown) and a cover in use would be secured to the top of the housing 1000 to cover the live terminals and provide an entry port for the electrical flex. The bulb receiving end of the housing 1000 defines an inner wall 1006 and support ledges 1007 and 1008 are defined internally in the housing. In use, an outer stepped portion 1087 of a shutter skirt 1082 is supported on the ledge 1007 and the terminal block 1030 is supported on the ledge 1008.

As with the previous embodiments, the terminal block 1030 is fixedly secured in the closed end of the housing 1000 by snap-engaging means and supports a pair of terminal contacts 1070 which extend through the terminal block 1030 so as to be accessible on opposite sides thereof. Each terminal contact 1070 comprises a flex engaging terminal 1071, a bulb engaging contact 1020 and a bridging spring 1078. As with the previous embodiments the bulb engaging contacts 1020 are preferably hollow, have a radial or arcuate cross-section, and their closed end 1023 defines a ramp formation 1022. One end of the bridging spring 1078 locates within the hollow contact 1020 and the other end of the spring 1078 locates within a

bore 1073 in the terminal 1071. Each terminal 1071 is a snap engaging fit in the terminal block 1030 by engagement with hooks 1047 of resilient finger members 1046 which extend from the inner surface of the terminal block 1030.

5

In this arrangement, the shutter 1080 and terminal block 1030 would first be assembled into the housing 1000. The bulb engaging contacts 1020 would then be inserted into the arcuate bores 1041, with the ends 1023 of the
10 contacts 1020 locating in the holding recesses 1092 in the shutter 1080. The bridging spring 1078 would then be inserted into the bore 1040 with one end of the spring 1078 locating within the hollow contact 1020. The free end of the spring 1078 would extend outwards of the bore
15 1041 to approximately the top of the fingers 1046 and would be engaged in the bore 1073 in the terminal 1071. The terminal 1071 would then be depressed inwards of the housing 1000 to load the spring 1078 until the terminal 1071 is gripped by the hooks 1047 on the fingers 1046
20 thereby retaining the terminal 1071 captive in the terminal block 1030.

The shutter 1080 locates in the bulb receiving end of the housing 1000 and defines a body portion 1081 which is

provided with a pair of spaced, arcuate contact receiving apertures 1091. A central boss 1085 also extends from the inner surface of the shutter 1080. The shutter 1080 also defines an annular skirt 1082 which extends outwardly to the open end of the housing 1000. The end 1087 of this skirt locates behind the wall 1006 and is supported on the ledge 1007. The skirt 1082 defines surfaces 1084 and 1085. In use, the surfaces 1084 extend across the inclined portions 1003 of the housing slots 1002 to provide the scissor formations which on bulb insertion/removal are engaged by the bayonet pins 1050 of a bulb to rotate the shutter 1080 relative to the housing 1000 in an amplified manner.

15 A pair of walled enclosures 1094 are defined in the shutter 1080 and act to enclose the arcuate apertures 1091 and adjacent contact holding recesses 1092. The enclosures 1094 are radial and arcuate to match the cross-section of the contacts 1020 and of a radial length which will accommodate the desired rotational movement of the shutter 1080 relative to said contacts 1020.

The enclosures 1094, in use, locate in the channels 1039 in the terminal block 1030 and are free to be moved

axially and to rotate within the channels 1039. A pair of limbs 1036 depend from the surface of the terminal block 1030 facing the shutter 1080 and extend into the enclosures 1094 to locate adjacent one end of each aperture 1091 in the shutter 1080. Each limb 1036 defines a ramp formation 1037. The ramp formations 1037 partially engage or locate adjacent respective ramp formations 1098 provided in the sides of said one end of each shutter aperture 1091. The terminal block limbs 1036 act to shield the contacts 1020 when the shutter 1080 is in its "closed" position.

The inward movement of the shutter 1080 and thereby the enclosure 1094 relative to the terminal block 1030 is depicted by numeral 1040. The wall 1090 of the enclosure 1094 is a close fit in the channel 1039 and, in conjunction with the limbs 1036, provide a shutter means such that when a bulb is not present in the lampholder the contacts 1020 are inaccessible and not visible.

20

The shutter 1080 is centralised in the housing 1000 by the boss 1085 which locates within the bore 1037 in the terminal block 1030 and by the annular wall 1006 of the housing 1000 which supports the end 1087 of the shutter

skirt 1082.

Figs. 21, 24A and 25A illustrate the position of the components of the lampholder prior to bulb insertion, in which the shutter 1080 is in its first "closed" position. The terminal block apertures 1041 are non-aligned with the shutter apertures 1091 and the ends 1023 of the contacts 1020 are located in the holding recesses 1092. The bridging springs 1078 are heavily loaded and biasing the contacts 1020 and thereby the shutter 1080 outwards of the housing 1000. The end of the shutter skirt 1082 is also biased against the support ledge 1007. The apertures 1091 in the shutter are closed by the inner surface 1037 and limbs 1036 of the terminal block 1030. The inclined surfaces 1084 of the shutter 1080 extend across the inclined longitudinal portion 1003 of the housing slots 1002. The ends 1023 of the contacts 1020 are located in recesses 1092 and at the bottom of the ramps 1089. The contacts 1020 thereby act to bias the shutter 1080 to its first "closed" position.

In use, insertion of a bulb is done in two stages, a first axial stage and a second rotational stage. In the first axial stage, as a bulb is inserted into the

lampholder the bayonet pins 1050 engage respective scissor formations presented by the inclined housing slots 1003 and shutter surfaces 1084. As the bulb is moved axially inwards of the lampholder the shutter 1080 is caused to

5 rotate in the housing 1000 in amplified manner, as the bayonet pins 1050 follow the path of the slots 1003. Rotation of the shutter 1080 causes the ramps 1089 to depress the contacts 1020 inwards of the housing 1000 and terminal block 1030, as the ends 1023 of the contacts 1020

10 ride up and over the ramp faces 1089 of the recesses 1092 and the ramp formations 1022 of the contacts 1020 engage respective ramp formations 1098 located at one end of the shutter apertures 1091. The contacts 1020 slide outwards of the housing 1000 via their ramps 1022 to partially

15 extend through the shutter apertures 1091, as the bayonet pins come to the end of their axial travel in the longitudinal portion of the slots 1003. Simultaneously, the bulb moves inwards of the shutter 1080 with its electrodes 1051 abutting the outer surface of the shutter

20 1080. This moves the shutter 1080 inwards of the housing 1000 and terminal block 1030, such that the top of the enclosure wall 1090 abuts the surface 1039 of the terminal block 1030 to close the gap depicted by the numerals 1040. The end 1087 of the shutter skirt 1082 is raised off the

support ledge 1007 in the housing 1000 and the lampholder components assume the position best illustrated in Figs. 22, 24B and 25B after the axial stage of bulb insertion.

5 Rotating the bulb in the lampholder causes the shutter 1080 to rotate with it. The pins 1050 drive the shutter 1080 via the surfaces 1084 to cause the contacts 1020 (by the first of the loaded springs 1078) to slide via their ramp formations 1022 down the inclined faces
10 1098. The ends 1023 of the contacts 1020 extend through respective apertures 1091 in the shutter 1080 to engage and energise the electrodes 1051 of the inserted bulb. The bayonet pins 1050 and thereby the bulb move outwards of the housing 1000 as pins 1050 are located in the
15 holding recesses 1005 and the lampholder components assume the position illustrated in Figs. 23, 24C and 25C when a bulb has been fully inserted.

On bulb removal, as the shutter 1080 is rotated from
20 its "open" back to its "closed" position, the ramp formations 1098 of the apertures 1091 engage respective ramp faces 1022 of the contacts 1020 to drive the contacts 1020 inwards of the housing 1000, against the force of the springs 1078, back through the apertures 1091. The ends

1023 of the contacts 1020 move down the inclined faces 1089 of the holding recesses 1092. The ends 1023 of the loaded contacts locate in the recesses 1092 prior to the bayonet pins 1050 emerging from the slots 1003 and 1083.

5 The end 1087 of the shutter skirt 1082 has relocated on the support ledge 1007 and the inclined shutter surfaces 1084 extend across the inclined axial portion 1003 of the housing slots 1002. The live bulb engaging contacts 1020 are located behind the shutter 1080 which has resumed its

10 "closed" position. The contacts 1020 are thus inaccessible and not visible and the lampholder components assume the position illustrated in Figs. 21, 24A and 25A when a bulb is removed from the lampholder.

15 It is desirable that the recesses 1092 are located sufficiently from the apertures 1091 in order that adequate ramp formations 1089 and 1098 may be provided. Amplifying/maximising shutter rotation within the housing 1000 by means of the scissor formations makes this

20 possible and also provides that the horizontal portion 1004 of the housing slots 1002 may be of a length which will conform to IEC standards for bayonet lampholders.

The arcuate, radial or oval first dimension of the

contacts 1020 are such that when the shutter 1080 is in its "open" position, contacts 1020 cannot pass right through the apertures 1091 as their ramps 1022 always extend inwards of the outer surface of the shutter 1080.

- 5 As with the previous embodiment the contacts 1020 may be provided with flared ends which would engage a step in the arcuate bores in the terminal block 1030 to limit the extent to which the contacts 1020 could extend through the apertures 1091.

10

Rotational movement of the shutter 1080 in the housing 1000 may be limited by the engagement of the enclosure wall 1090 with the vertical faces 1038 of the terminal block channels 1039.

15

- Preferably, the bulb engaging contacts 1020 are of arcuate or oval cross-section such that they have a first dimension which is greater than a second dimension, the first dimension allowing the facility to provide a long
20 ramp formation at the closed end 1023 of the contacts 1020 and by means of which the contacts are driven back behind the shutter 1080. The restricted dimensions of a lampholder will not accommodate contacts of a circular cross-section with an adequate ramp formation and further,

it would be virtually impossible to shutter such contacts.

Figs. 26 and 27 illustrate enlarged cross-sectional views showing the relationship between the shutter 1180, bulb engaging contacts 1120 and terminal block 1130. In this embodiment the shutter 1180 does not move inwards of the housing 1000 and is simply rotated between its two positions by the engagement of the bayonet pins 1050 in the slots 1003 and 1083. The outer surface 1135 of the terminal block 1130 acts to close the apertures 1191 in the shutter 1180 when the shutter 1180 is in its "closed" position. The respective limbs 1136 may act to limit rotational movement of the shutter 1180 within the housing 1000 by engagement with the vertical face at one end of the apertures 1191. All other aspects of this embodiment correspond to those of Figs. 21 to 23 including the arcuate contacts 1120 and holding recesses 1192.

Referring to Fig. 28, this illustrates a part cross-sectional view of the bulb receiving end of a housing 1100 which defines an inner wall portion 1111. The wall 1111 extends inwards of the housing 1100 to the level of the bottom of the holding recesses 1103 in the horizontal portion of the housing slots 1101. In this arrangement

the bayonet pins 1050 would be supported by both the recesses 1103 and the rim of the 1112 of the inner wall 1111.

5 It should be noted, that in for example the housing 400 of Figs. 1 to 15 the inclined housing slots 402 may be provided in the inner wall 405. In that case, the inner wall 405 would extend inwards of the housing 400 such that the rim of the wall 405 was on a level with the horizontal
10 portion of the housing slots 401 and a holding recess 404 provided in the inner wall 405.

 The inclined housing slots in the inner wall 405 would interact with the shutter slots 484 to present the
15 scissor formation to the bayonet pins 550. In such an arrangement housing slots 401 would not be provided in the external wall of the housing 400.

 A further alternative to the Figs. 1 to 15 embodiment
20 is illustrated in Fig. 29. Fig. 29 illustrates a lampholder 1300 which includes contacts 1320 which do not include flares at their open ends. Such flares may be omitted as the cylindrical contacts do not need them to gain support from other components in the lampholder (such

as the terminal block or axially movable support plate member).

Figs. 30 to 33, 35 and 36 illustrate an alternative
5 embodiment of the present invention, comparable to that
illustrated in Fig. 23 in that it omits an axially movable
support plate. In this embodiment the terminal block 1530
for housing 1500 communicates with bulb engaging contacts
1520. The terminal block 1530 is provided with a pair of
10 deflectable limbs 1535, 1536 in which each limb has a ramp
surface 1538, 1539 respectively. The limbs 1535, 1536
provide a means for securing the terminal block 1530 into
the lampholder housing 1500, as discussed in more detail
below.

15

In this embodiment, the lampholder housing 1500 is in
two main parts, namely base part 1501 and cover part 1502.
The base part 1501 has a deflectable clip 1511 to
interengage cover part 1502 (see Fig. 31).

20

The cover part 1502 is provided with a pair of
apertures 1521, each arranged to receive a respective limb
1535, 1536 from the terminal block 1530.

In use, the bulb engaging contacts 1520, shutter member 1550 and terminal block 1530 may be secured together as a subassembly and mounted in base part 1501 of the housing. The cover part 1502 is subsequently secured
5 in position by engagement of terminal block limbs 1538, 1539 in apertures 1521, as illustrated in Figs. 32 and 33. A shade locking ring 1550 may be subsequently secured to the base part 1501.

10 This illustrated embodiment has advantages in terms of the ease of assembly (particularly utilising the two part cover for interengagement with the terminal block) and also in disassembly when desired. This may be achieved by deflecting limb 1536 inwardly of the housing
15 1500 and rotating the cover part 1502, which itself causes deflection of limb 1535, to disengage the cover part 1502 from both the terminal block 1530 and base part 1502. This arrangement considerably facilitates maintenance of the lampholder.

20

Fig. 35 is a cross-sectional view illustrating the shutter 1550 in more detail and Fig. 36 is a plan view from above of the part assembled lampholder (omitting cover part 1502). This illustrates the provision of

channels 1531 in the terminal block 1530 to inhibit release of screws 1532 from the flex engaging terminals.

It is the screws 1532 which provide a means for interengaging the flex engaging terminals with the
5 electrical flex.

Fig. 34 illustrates a similar lampholder in which the housing 1600 includes a base part 1601 for engagement with a corresponding cover part. This
10 embodiment illustrates how a support member 1640 may be accommodated in the subassembly with the contacts 1620, shutter 1650 and terminal block 1630.

It will be appreciated that various modifications may
15 be made to the illustrated embodiments. In particular, the use of a terminal block with deflective limbs for releasable interengagement with a lampholder housing comprising a cover part and base part is applicable to any of the prior embodiments. Likewise, channels (such as
20 1531) for retaining terminal contact screws captive in the terminal block may be provided in any of the illustrated embodiments.

CLAIMS

1. A safety lampholder for a bayonet bulb, the
lampholder comprising a housing defining slots at one end
5 thereof to receive bayonet pins of an inserted bulb,
resilient bulb engaging contacts for electrical connection
to a power source to supply electricity to the bulb being
arranged within the housing and biased outwardly thereof,
the contacts having ramp formations at their respective
10 free ends, rotatable apertured shutter means being located
within the housing for selectively obstructing access to
the contacts and arranged so as to be actuable upon
insertion and removal of a bulb, the shutter means being
arranged such that both axial and rotational insertion of
15 a bulb actuates displacement of the shutter means against
the bias of the contacts between a first inoperative
position in which the shutter means obstruct the contacts
and the contacts are offset from the shutter apertures,
and a second operative position in which the free ends of
20 the contacts extend through the apertures in the shutter
means to bear against an inserted bulb, and both axial and
rotational removal of a bulb actuates displacement of the
shutter means which is effective to drive the contacts
inwardly of the housing and against the bias of the

contacts to the first inoperative position by interengagement of the shutter means with ramp formations on the contacts.

5 2. A lampholder according to Claim 1 wherein the housing and shutter means are arranged to engage the bayonet pins of an inserted bulb, the housing having slots each comprising a circumferential portion and an inclined longitudinal portion and the shutter means having inclined
10 surfaces arranged in opposition to the inclined longitudinal portions of the housing slots such that axial insertion of bayonet pins into the longitudinal portion of housing slots is effective to engage the inclined surfaces of the shutter means to drive rotation of the shutter
15 means.

3. A lampholder according to Claim 1 or Claim 2 wherein the bulb engaging contacts comprise cylinders of an electrically conductive material, the cylinders being of
20 generally arcuate form in cross-section, having a first dimension greater than a second dimension.

4. A lampholder according to Claim 3 wherein the contacts are arranged with their respective first



dimensions circumferentially spaced about the axis of rotation of the shutter means.

5. A lampholder according to Claim 3 or Claim 4 wherein
5 the first dimension of a cylinder decreases along a length
of the cylinder at the free end of a contact to define the
ramp formation.
6. A lampholder according to any preceding claim wherein
10 the ramp formation on a bulb engaging contact comprises an
inclined slope.
7. A lampholder according to any preceding claim wherein
an aperture in the shutter means has a wall of ramp form
15 arranged for interengagement with a ramp formation of a
contact to assist in driving the contact inwardly of the
housing.
8. A lampholder according to any preceding claim
20 wherein the apertures in the shutter means are of arcuate
form.
9. A lampholder according to any preceding claim wherein
the contacts are arranged so that, in the second operative



position, the ramp formations at the free ends of the contacts do not extend completely through the apertures in the shutter.

5 10. A lampholder according to any preceding claim wherein recesses are provided in the shutter means alongside the apertures in the shutter means, the recesses being arranged to accommodate the free ends of the contacts when the lampholder is in the first inoperative position, so as
10 to inhibit rotation of the shutter means in the absence of a bulb.

11. A lampholder according to any preceding claim wherein means are provided for rotationally biasing the shutter
15 means to the closed position.

12. A lampholder according to Claim 11 wherein an axially movable member is located in the housing and biased outwardly thereof, the axially movable member being
20 arranged to engage the shutter means to rotationally bias the shutter means to the first inoperative position.

13. A lampholder according to Claim 12 wherein the axially movable member and shutter means have



interengageable surface formations arranged such that rotation of the shutter means drives axial displacement of the axially movable member.

5 14. A lampholder according to Claim 13 wherein the axially movable member and shutter means have interengageable surface formations in the form of ramps.

15 15. A lampholder according to any preceding claim wherein
10 surface formations in the housing are arranged to extend into apertures in the shutter means so as to shield the contacts from the apertures in the shutter means when the lampholder is in the first inoperative position.

15 16. A lampholder according to any one of claims 12 to 15 wherein the axially movable member has surface formations which extend into the apertures in the shutter means.

17. A lampholder according to any preceding claim wherein
20 the shutter means is arranged in the lampholder housing so as to be capable of rotational and axial displacement between the first and second positions.

18. A lampholder according to any preceding claim wherein



the shutter means is arranged in the lampholder housing so as to require rotational displacement from the first position before it is capable of axial displacement inwardly of the housing to the second position.

5

19. A lampholder according to any preceding claim wherein the lampholder housing comprises releasably engagable base and cover parts.

10 20. A lampholder according to any preceding claim wherein the bulb engaging contacts are resiliently connectable to respective terminal contacts located in a terminal block, the terminal block being releasably securable in the lampholder housing by way of deflectable limbs arranged to
15 be accessible externally of the housing.

21. A lampholder according to any preceding claim which includes a terminal block to accommodate terminal contacts for releasably engaging electrical flex to provide an
20 electrical connection to the bulb engaging contacts, wherein the terminal block is provided with surface formations to retain the means for interengaging the terminal contacts and electrical flex.



* C L M S *

22. A lampholder substantially as hereinbefore described with reference to, and as illustrated in, any one of the accompanying drawings.

5

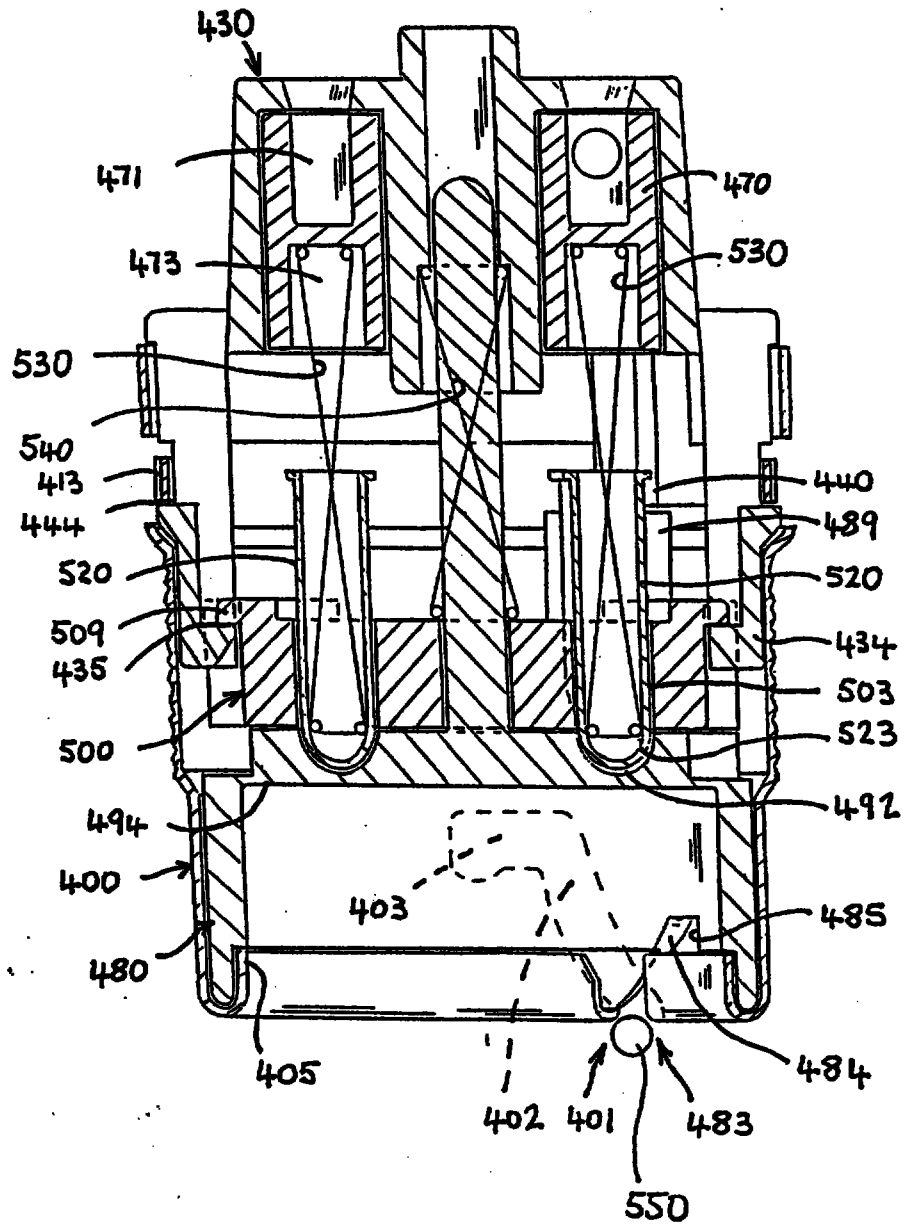


ABSTRACT (Fig. 1)LAMPHOLDER

A safety lampholder comprises a housing (400) with
5 slots (401) to receive bayonet pins (500) of an inserted
bulb. Resilient bulb engaging contacts (520) supply
electricity to the inserted bulb. The contacts (520) have
ramp formations (522) at their respective free ends. A
rotatable apertured shutter means (480) is also located
10 within the housing (400) for selectively obstructing
access to the contacts (520). The shutter (480) requires
axial and rotational insertion of a bulb to actuate its
displacement, between a first inoperative position in
which it obstructs the contacts and the contacts are
15 offset from the shutter apertures (492), and a second
operative position in which the free ends of the contacts
extend through the apertures (492) in the shutter means to
bear against an inserted bulb. Both axial and rotational
removal of a bulb actuates displacement of the shutter
20 means (480) to drive the contacts (520) inwardly of the
housing (400) and against the bias of the contacts (520)
to the first inoperative position by interengagement of
the shutter means (480) with ramp formations (522) on the
contacts.

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FIG 1.

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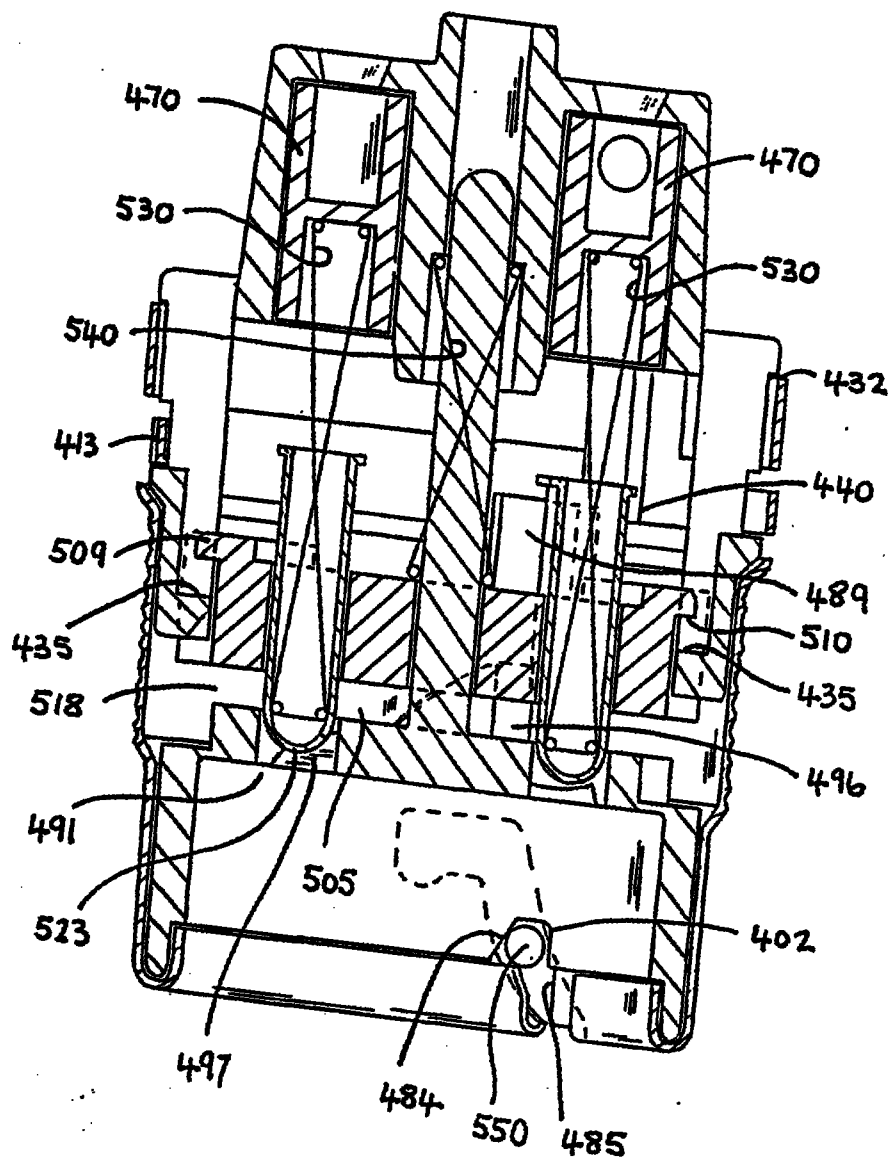
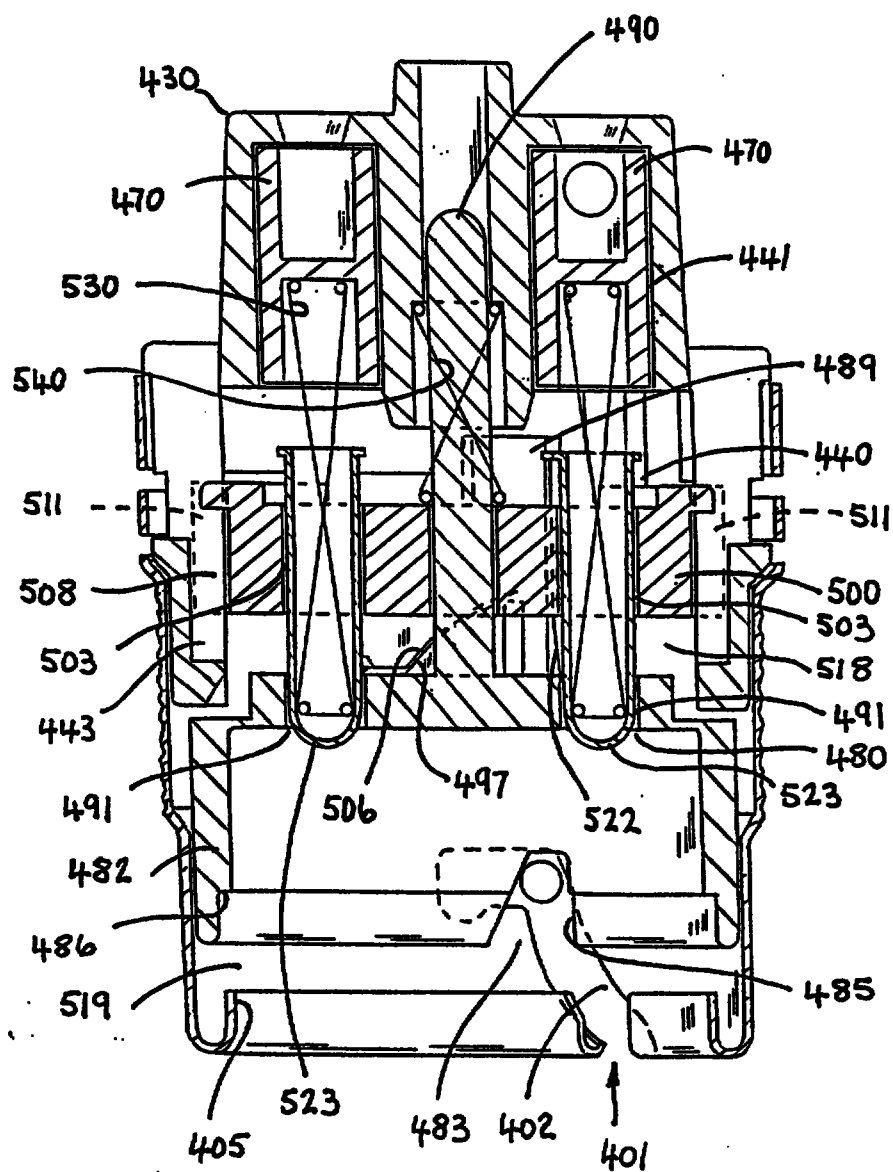


FIG 3



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FIG 4

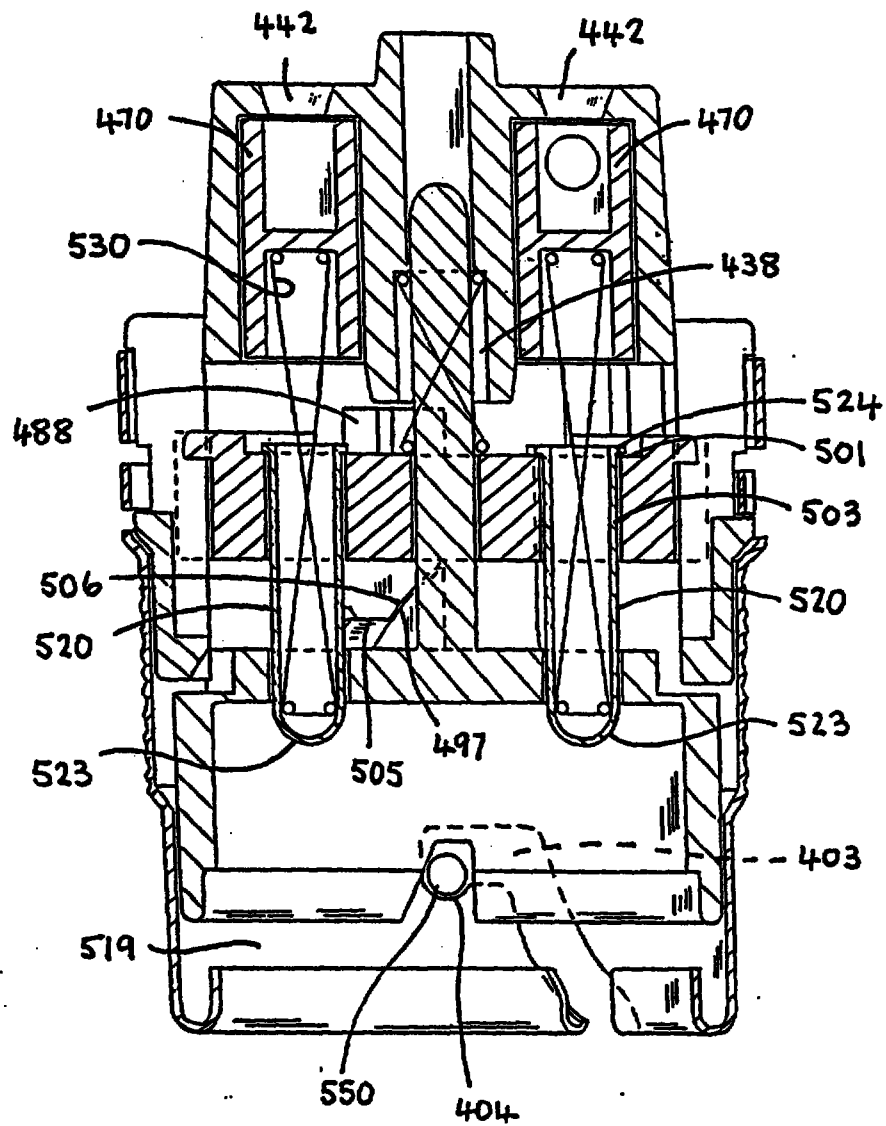


FIG 5

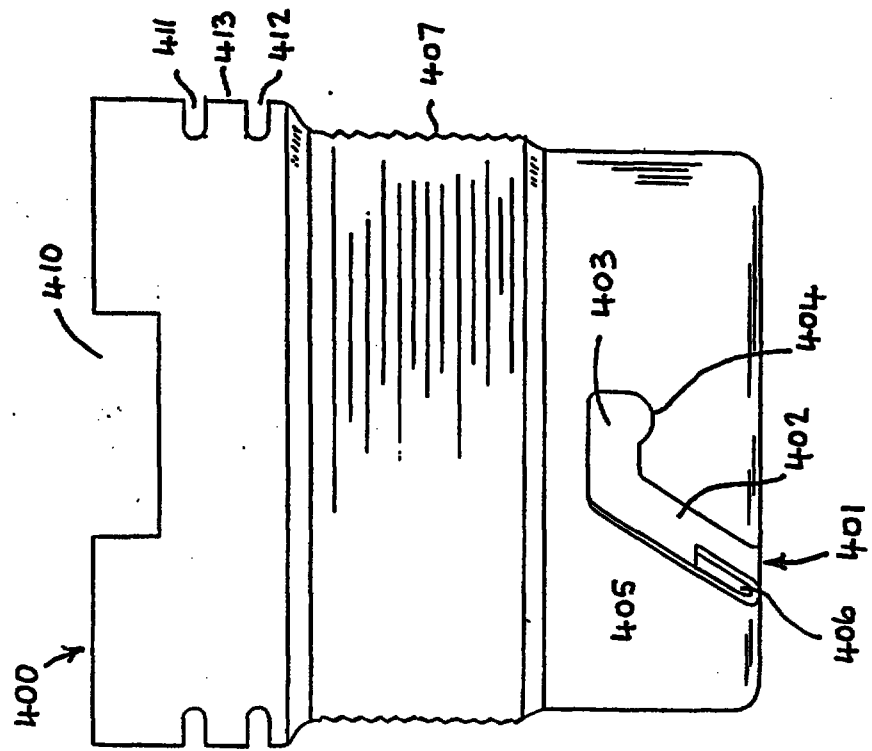
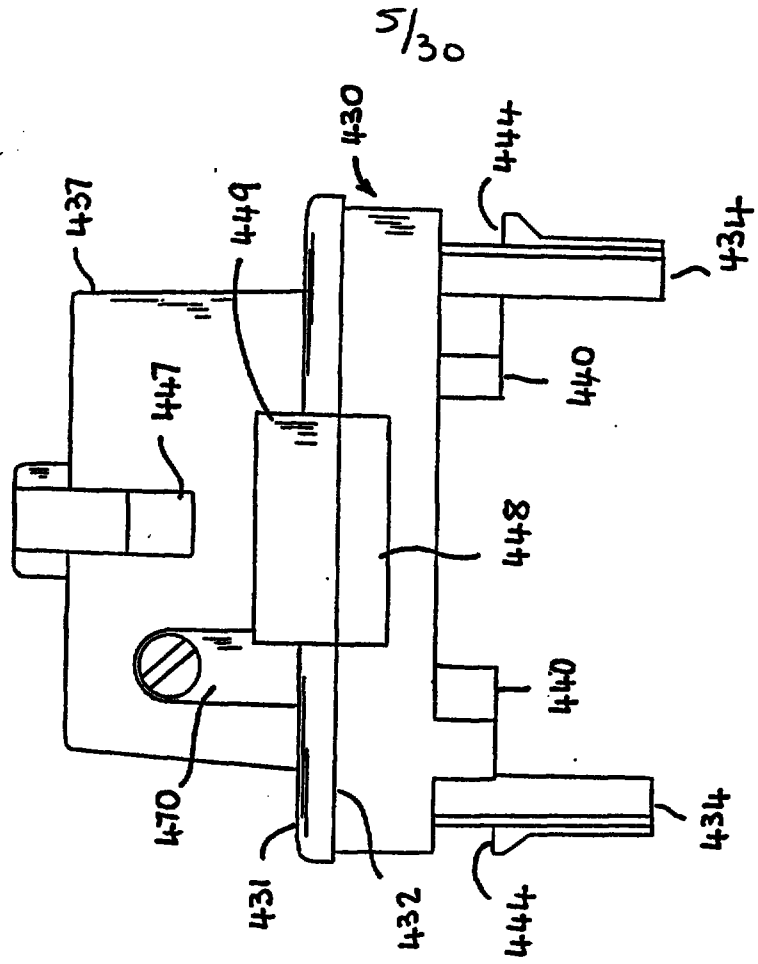


FIG 6



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FIG 7

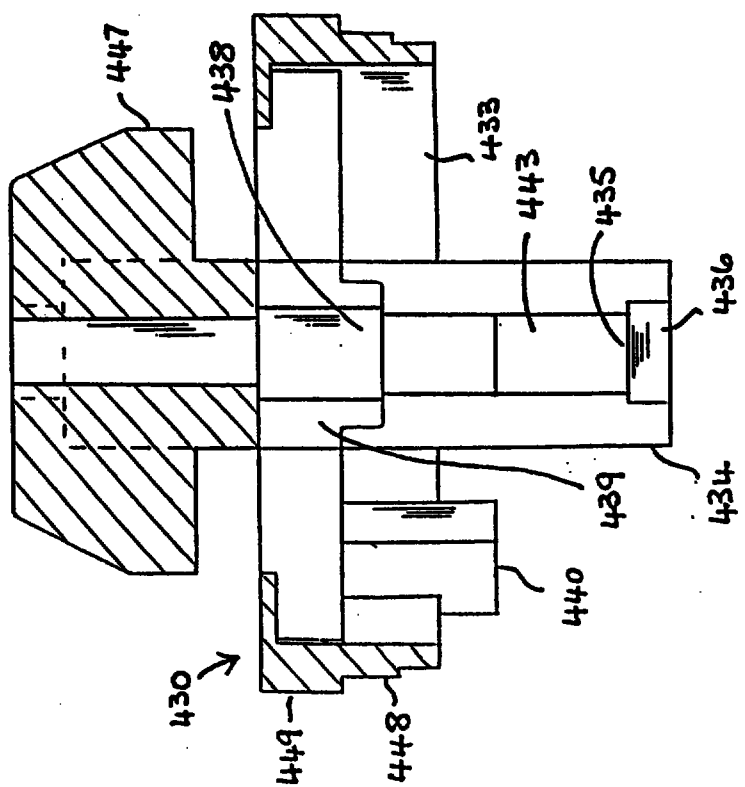
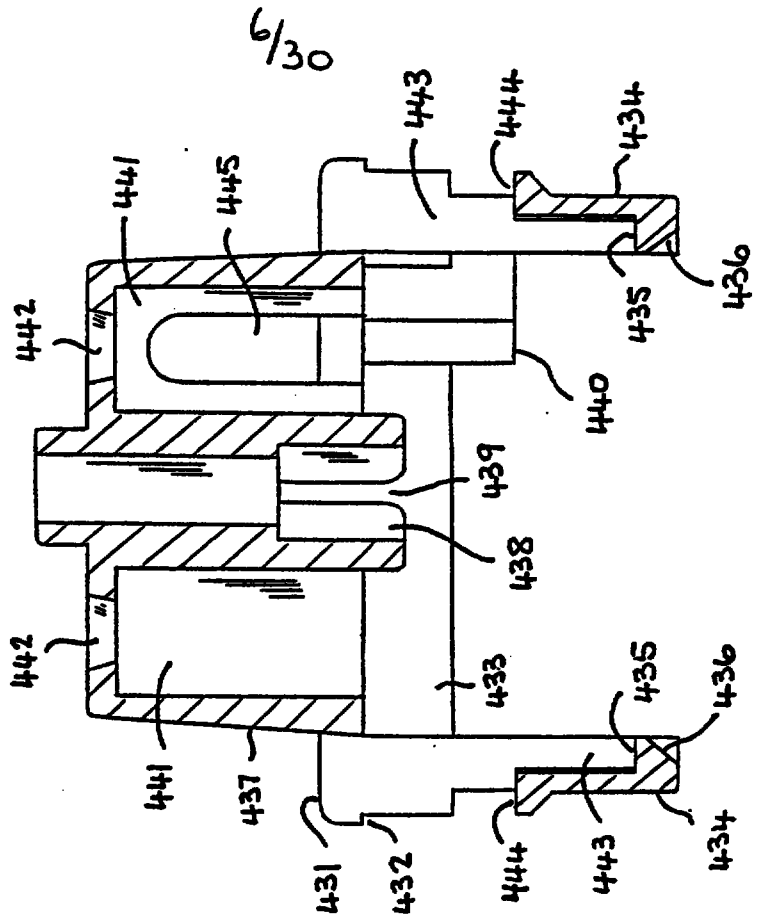
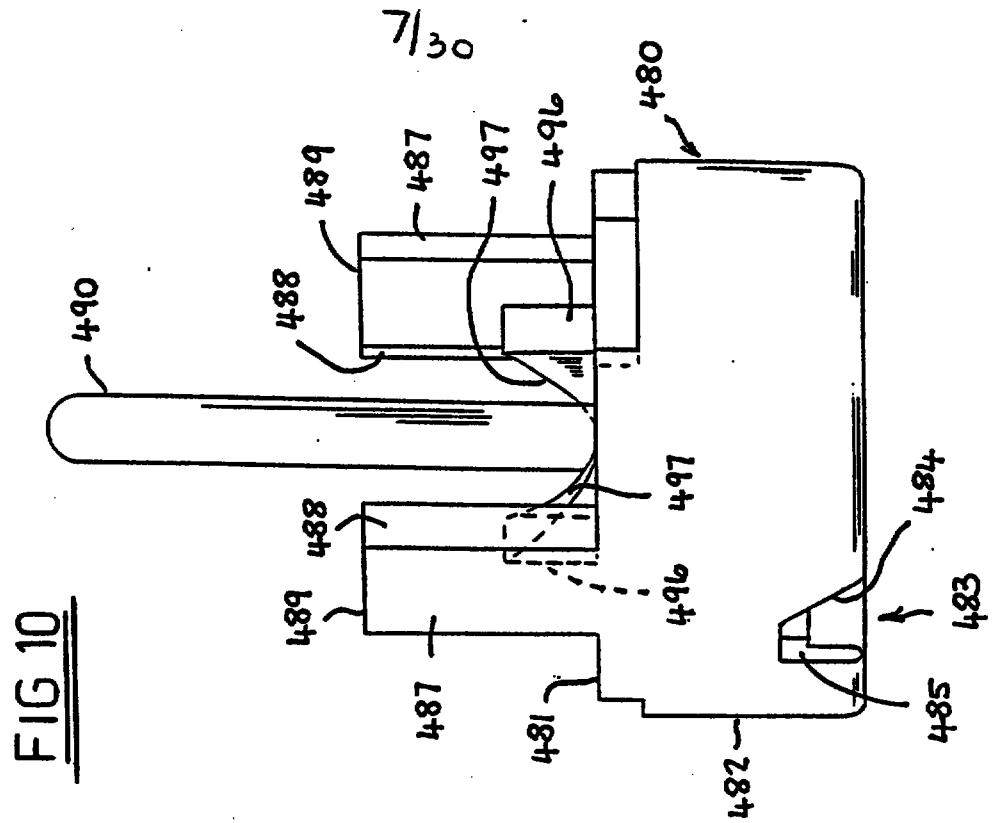
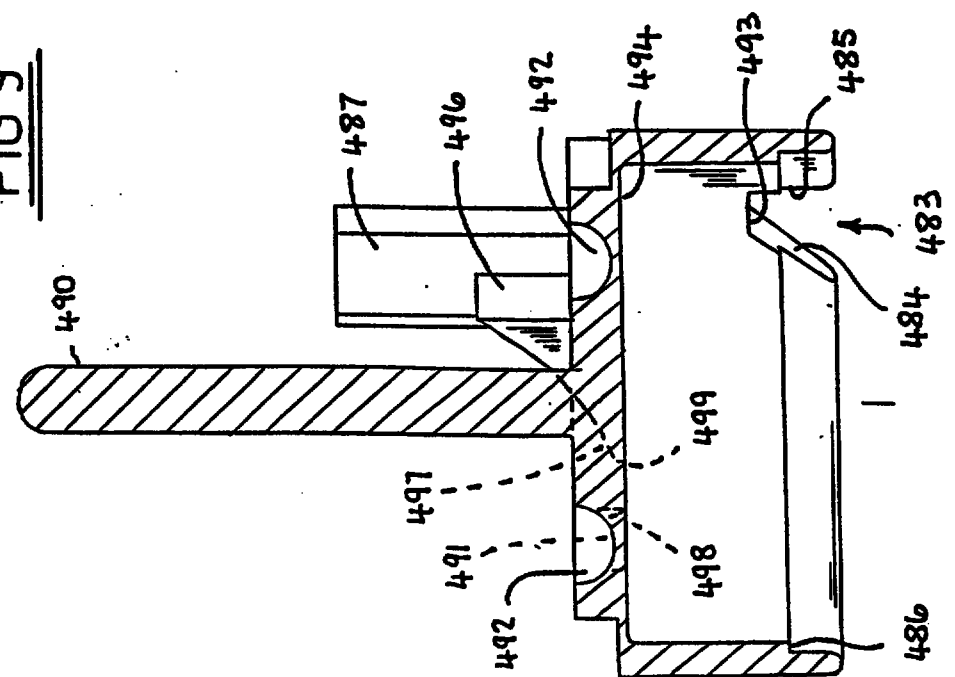


FIG 8





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FIG 11

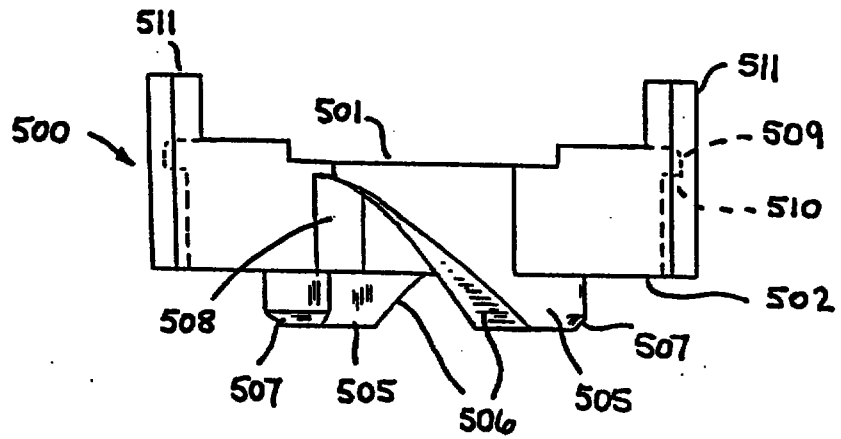


FIG 12

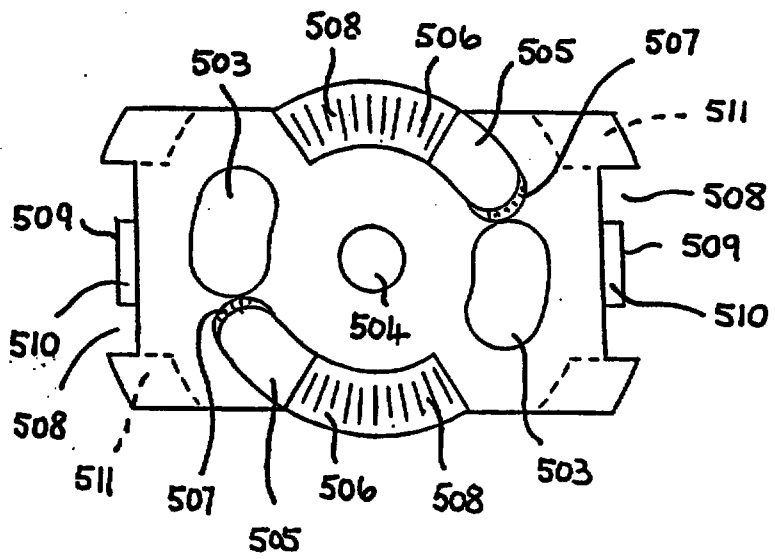
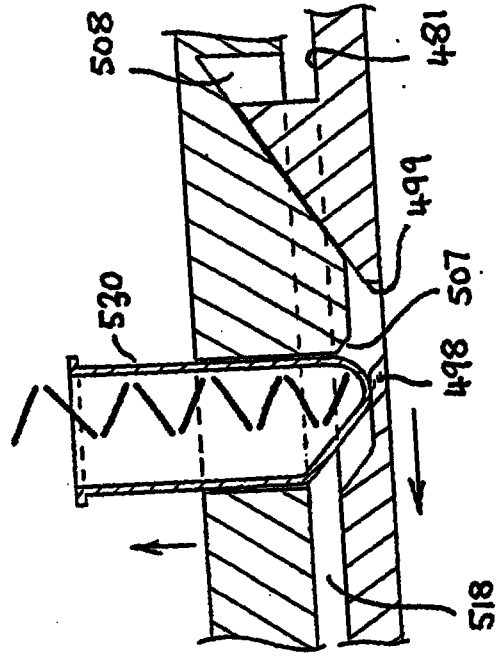
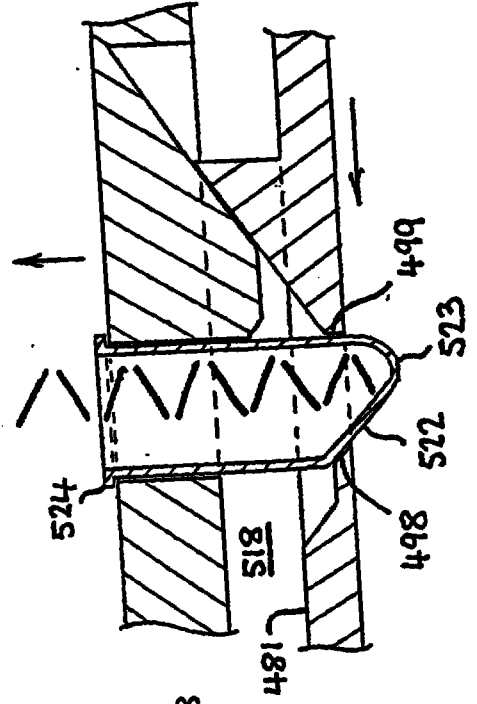


FIG 13

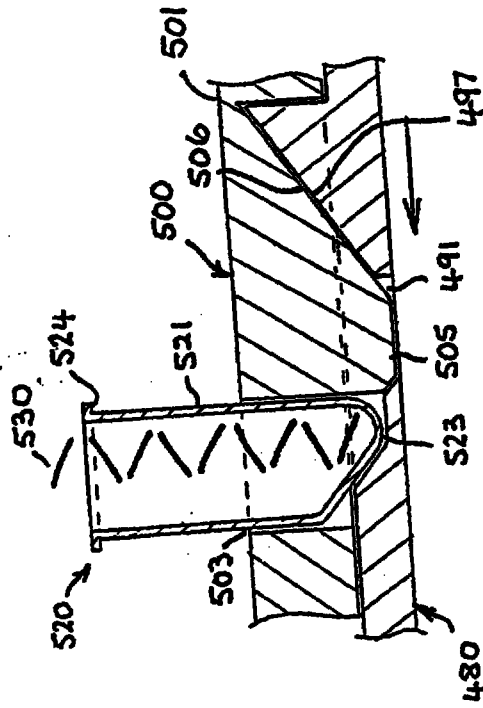
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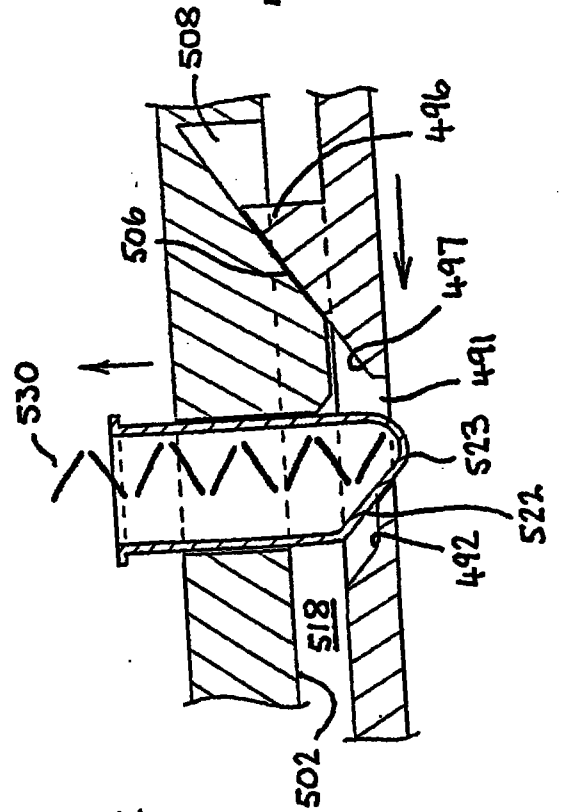
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A

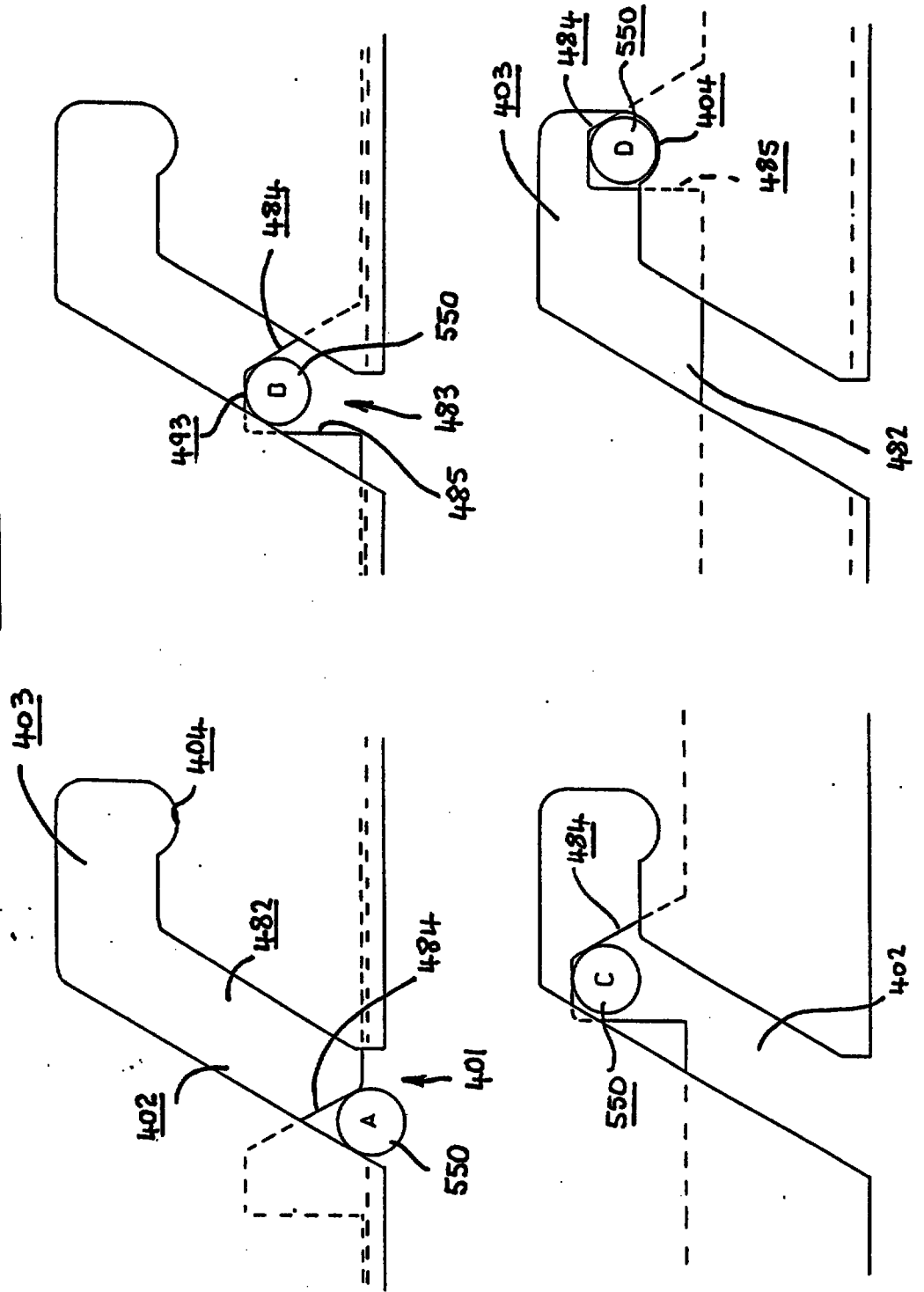


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FIG 14



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FIG 15

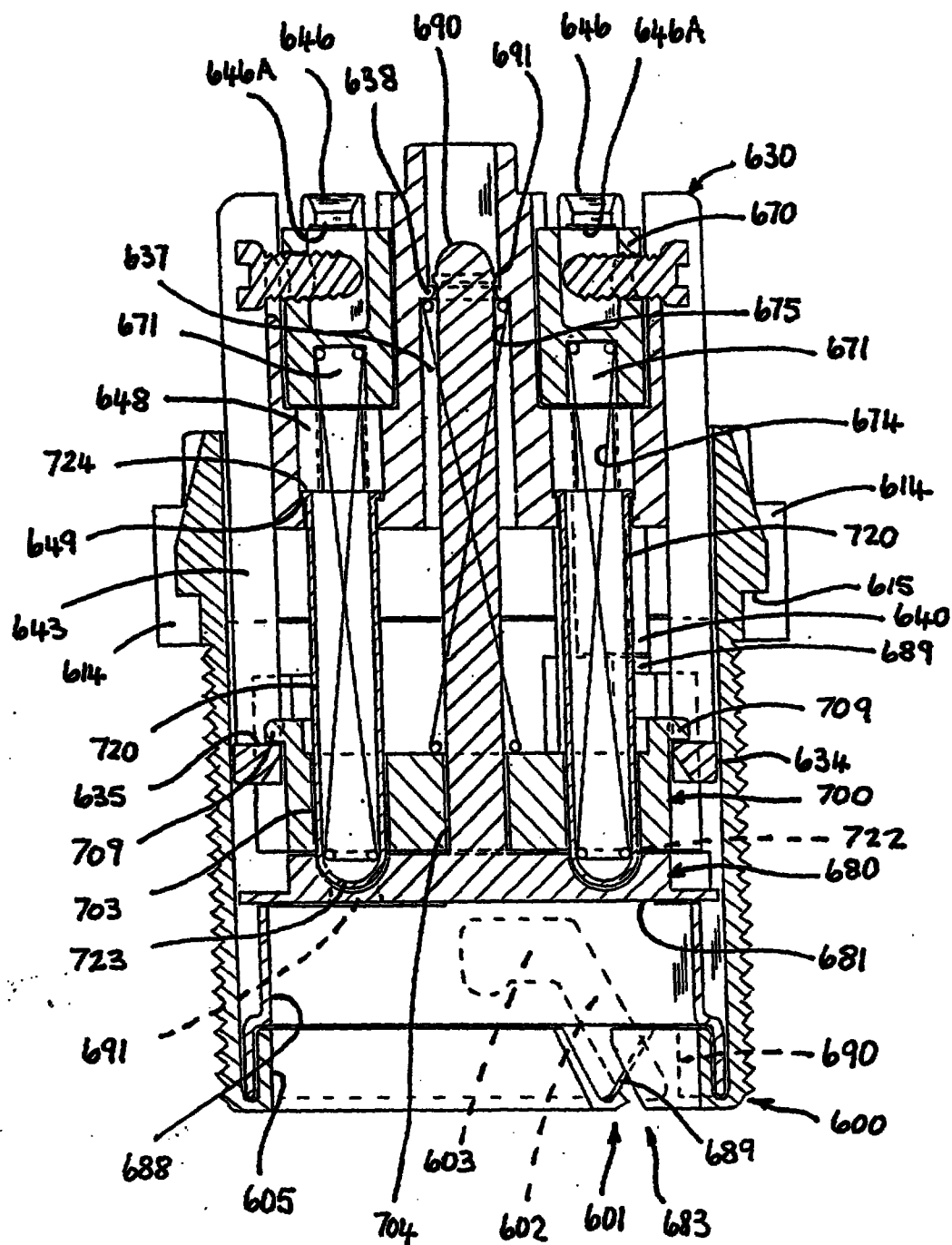


FIG 16

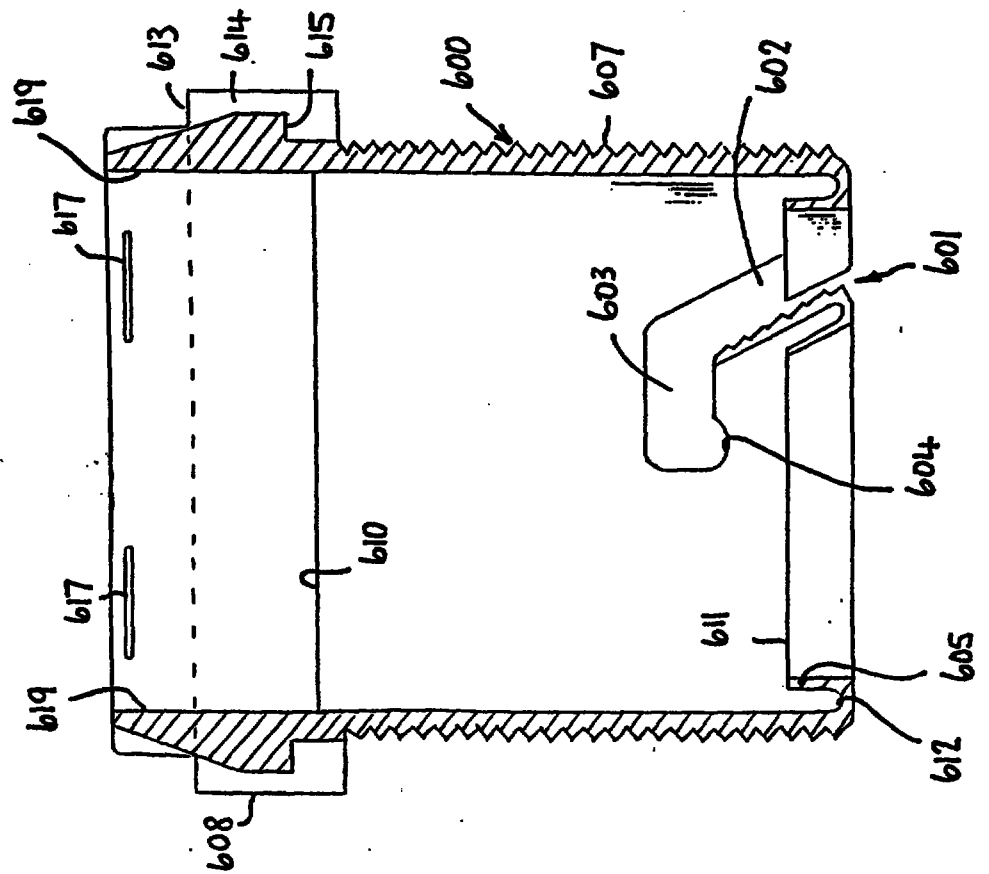
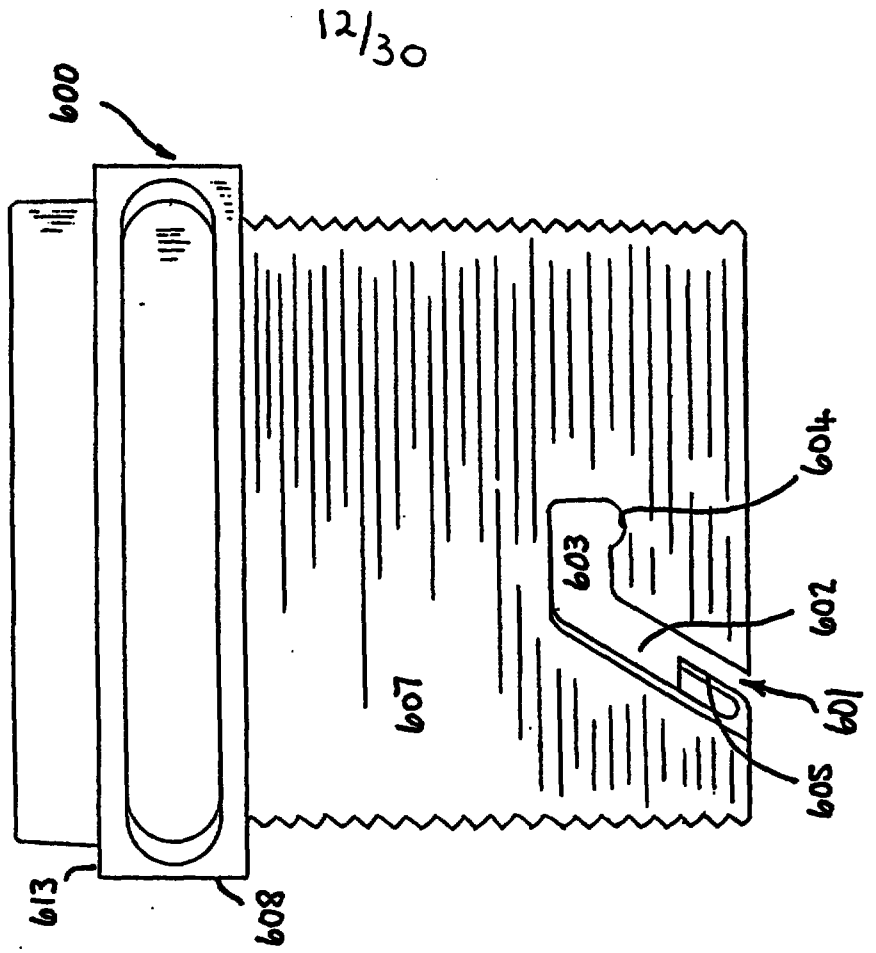
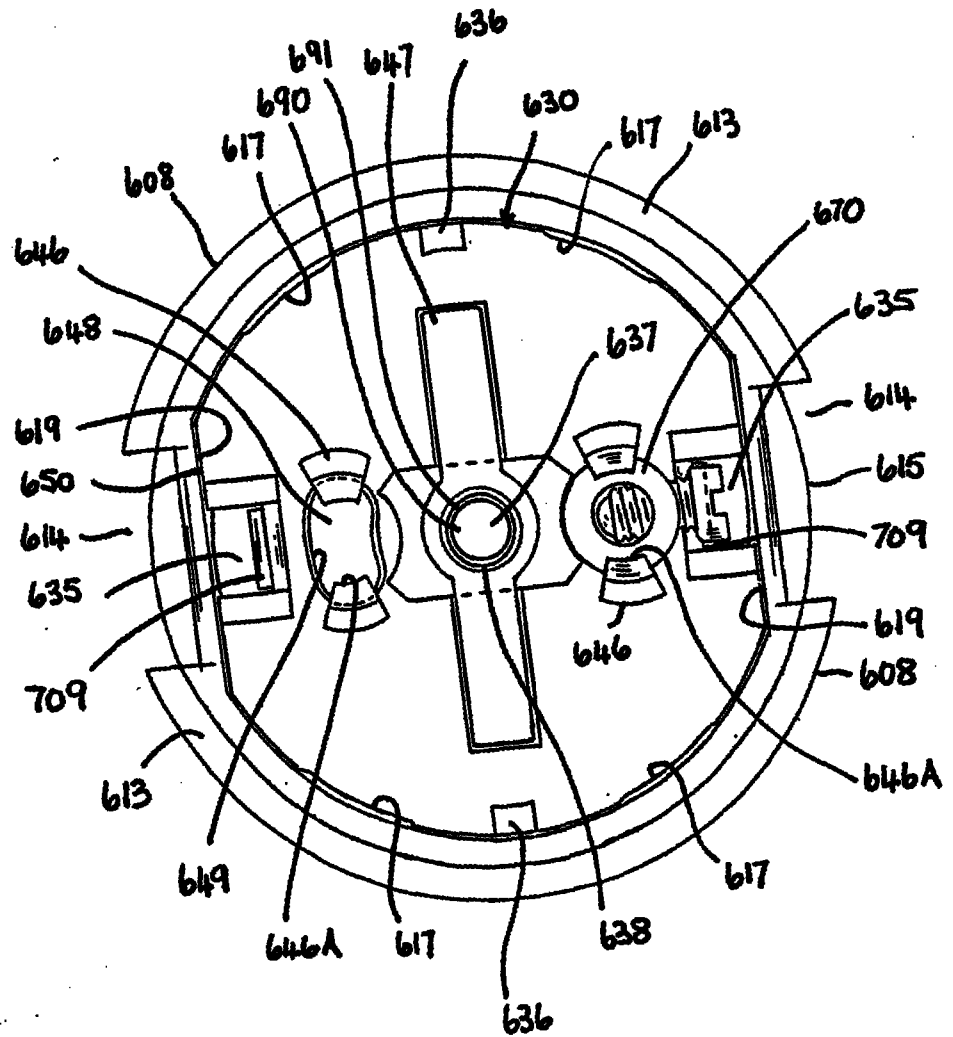


FIG 17

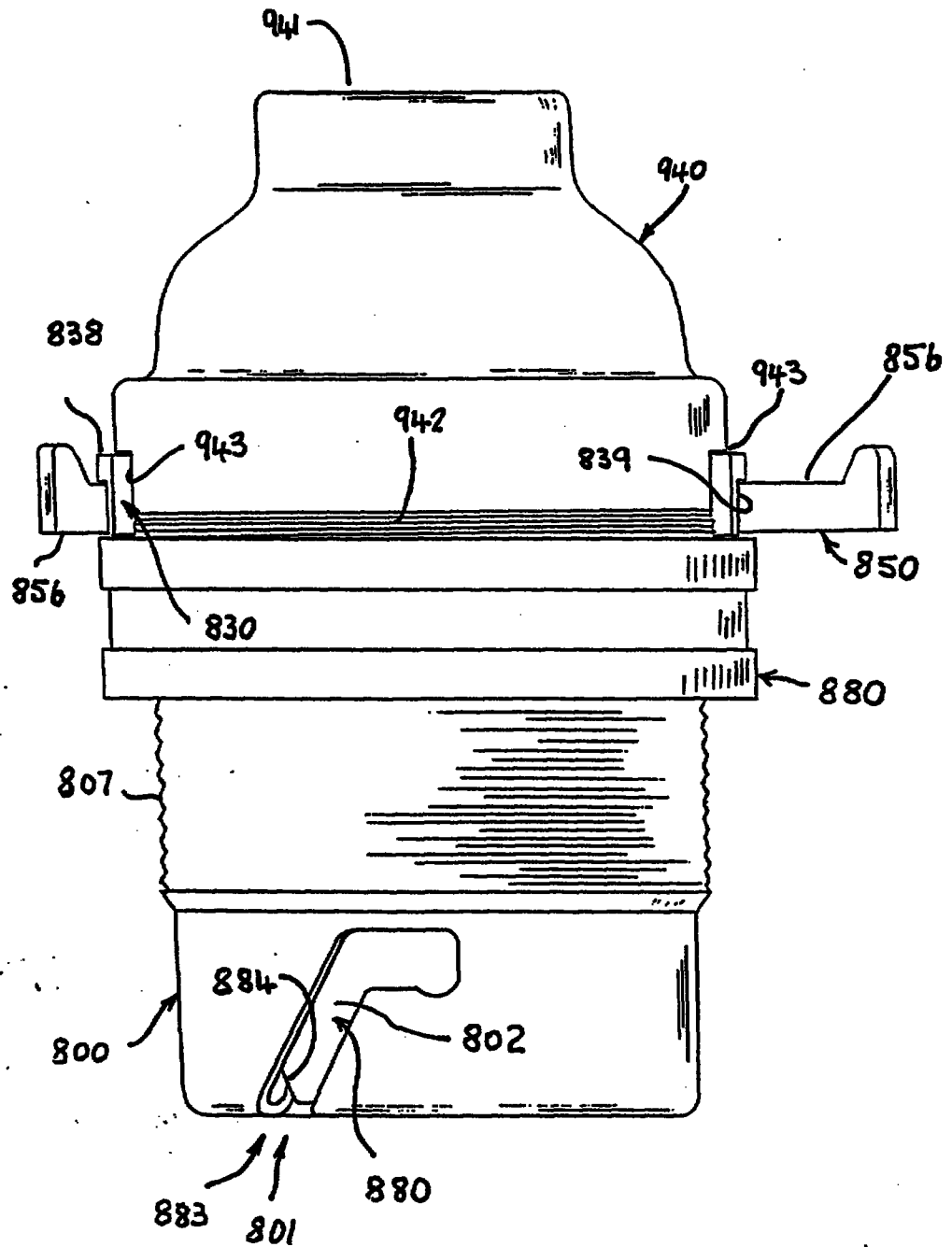


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FIG 18

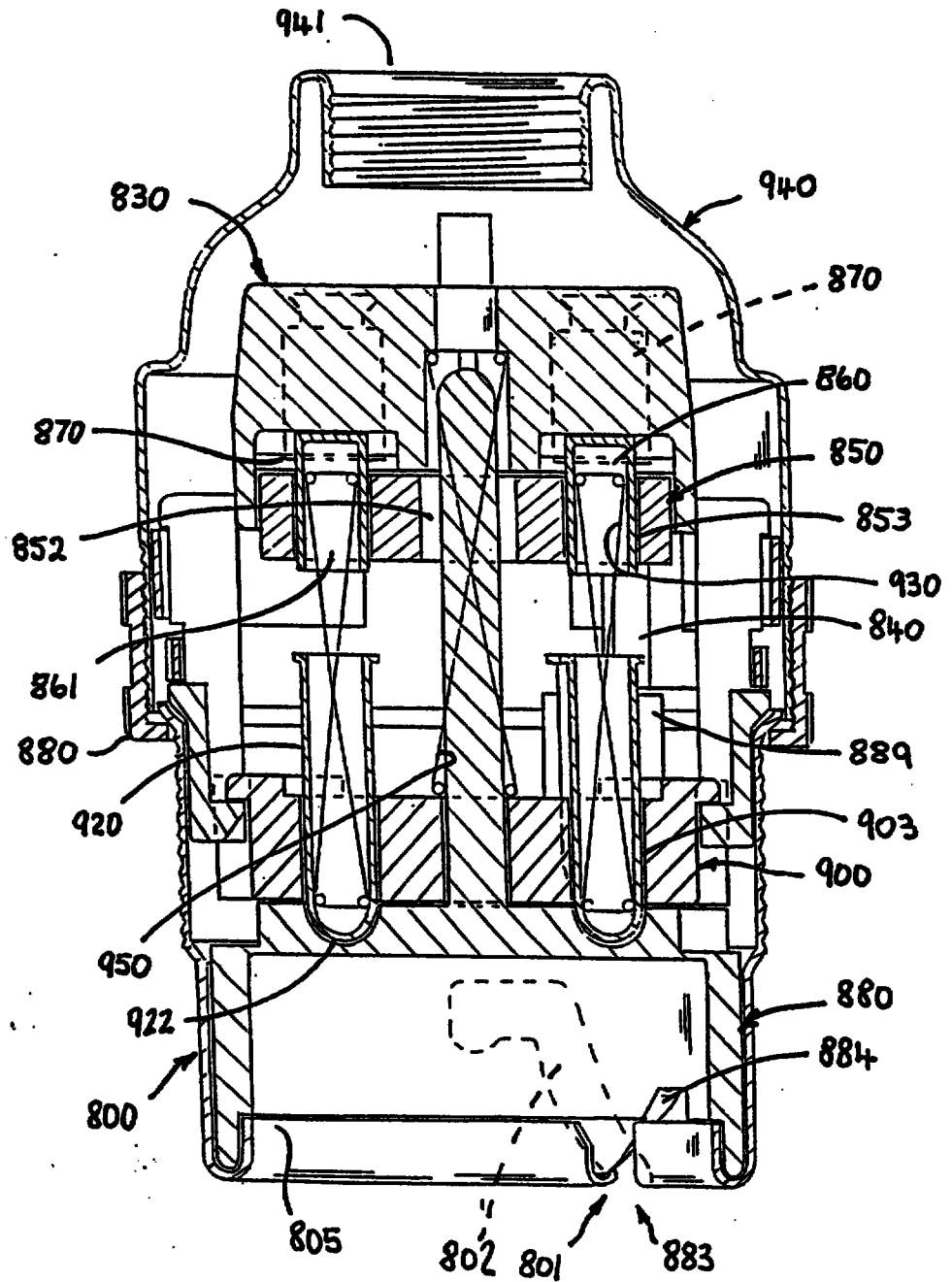
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FIG 19



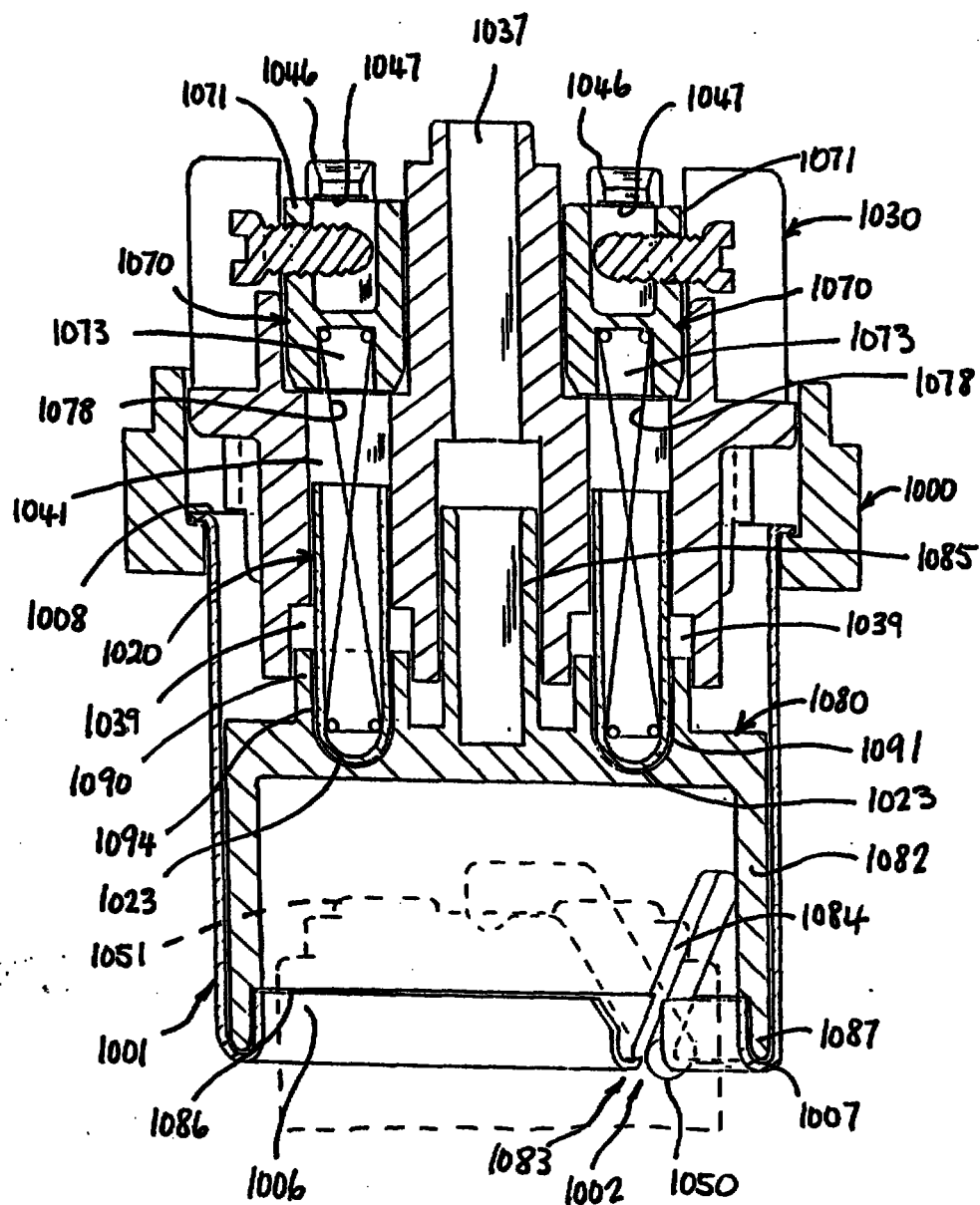
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FIG 20



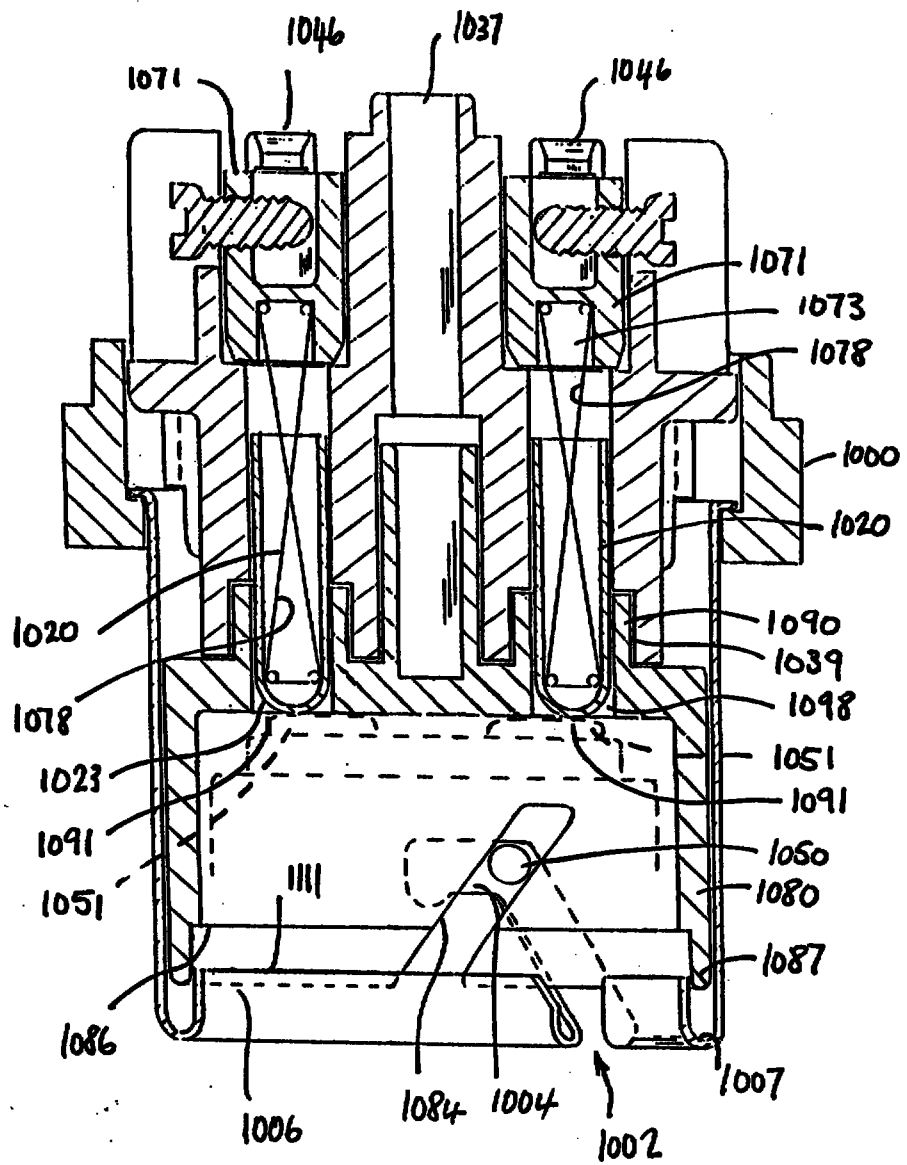
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FIG 21



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FIG 22



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FIG 23

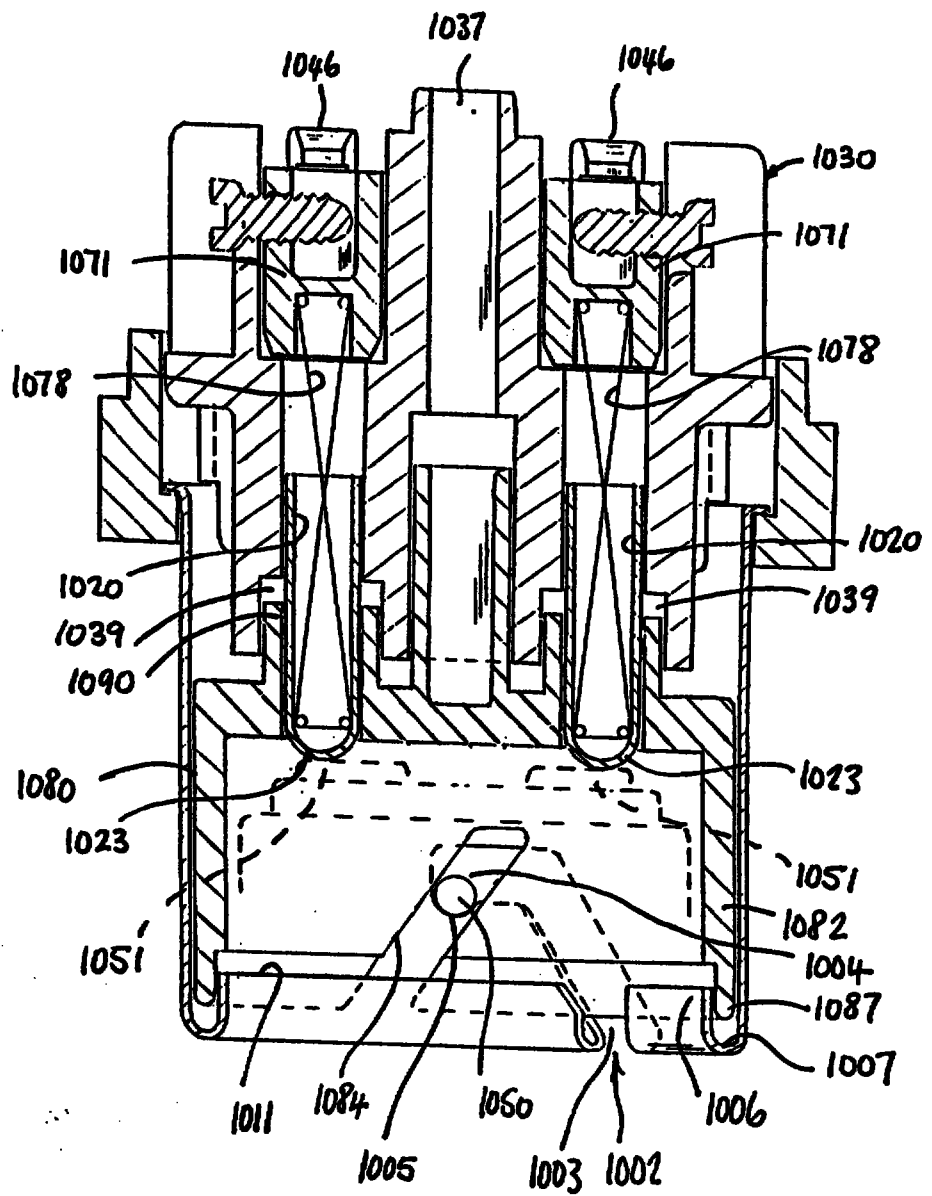


FIG 24A

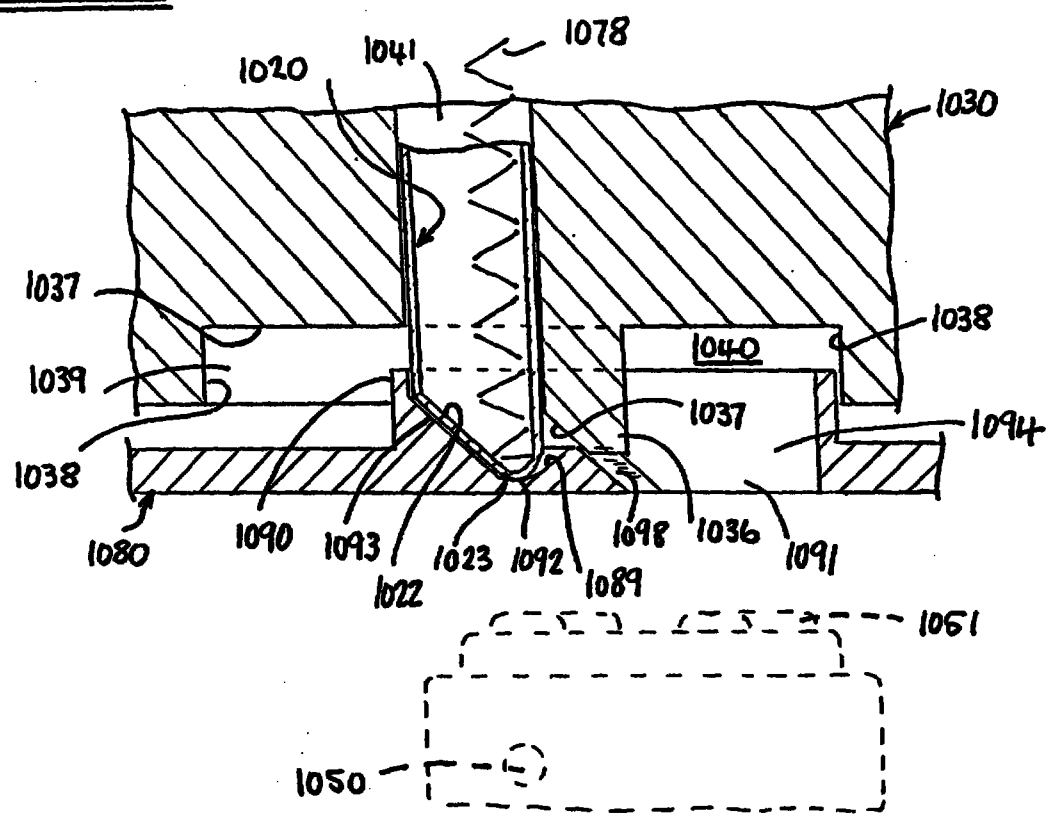
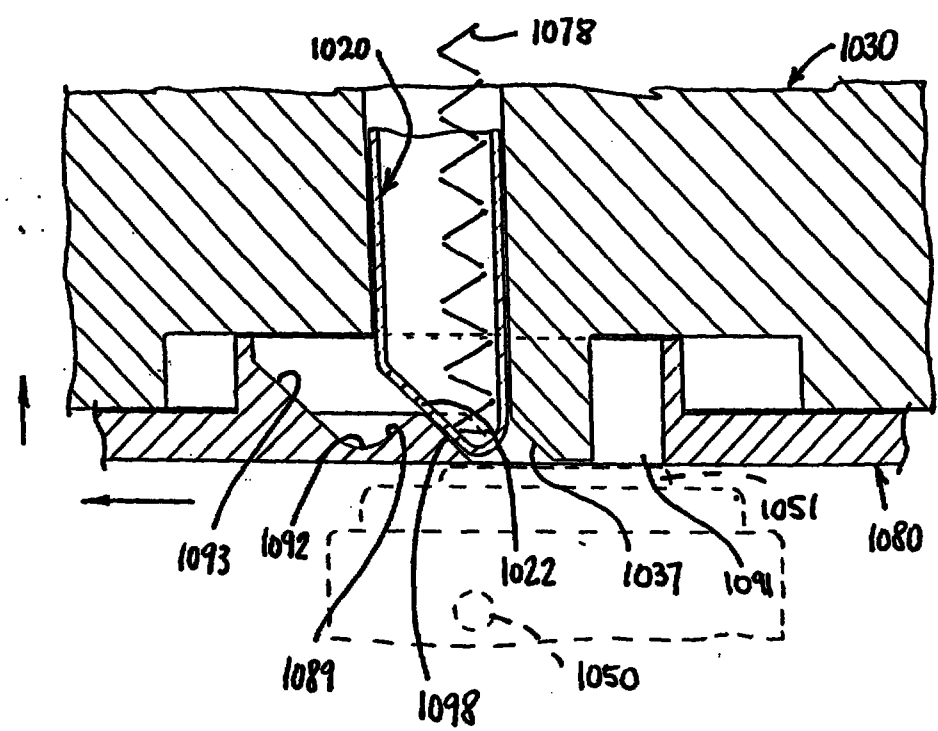


FIG 24B



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FIG 24C

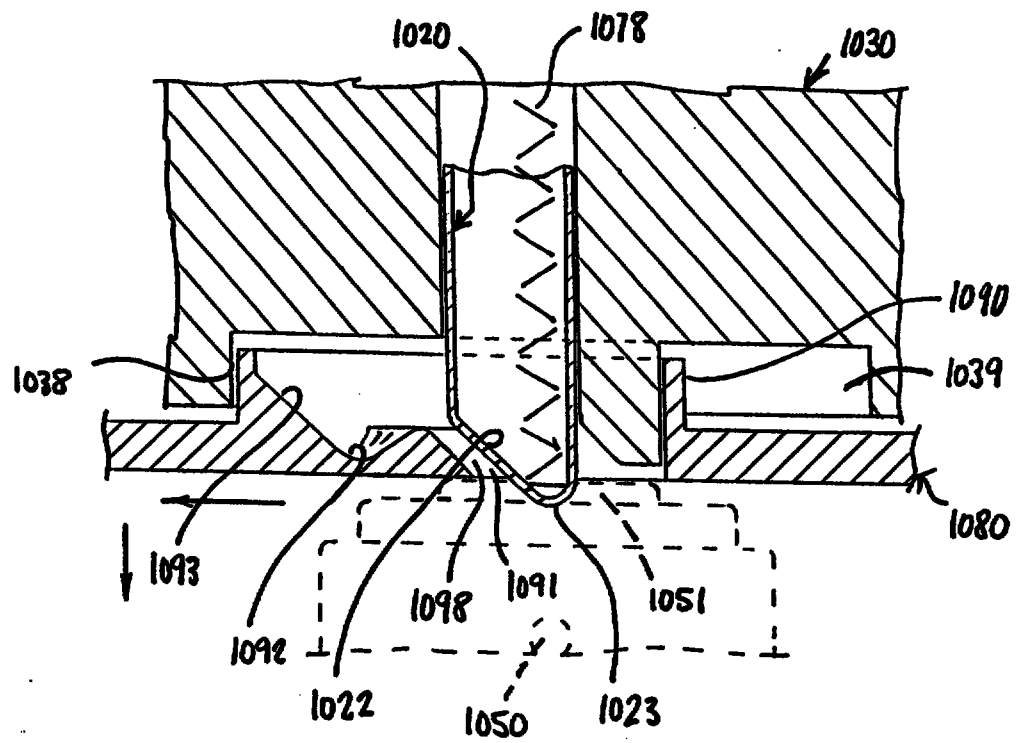
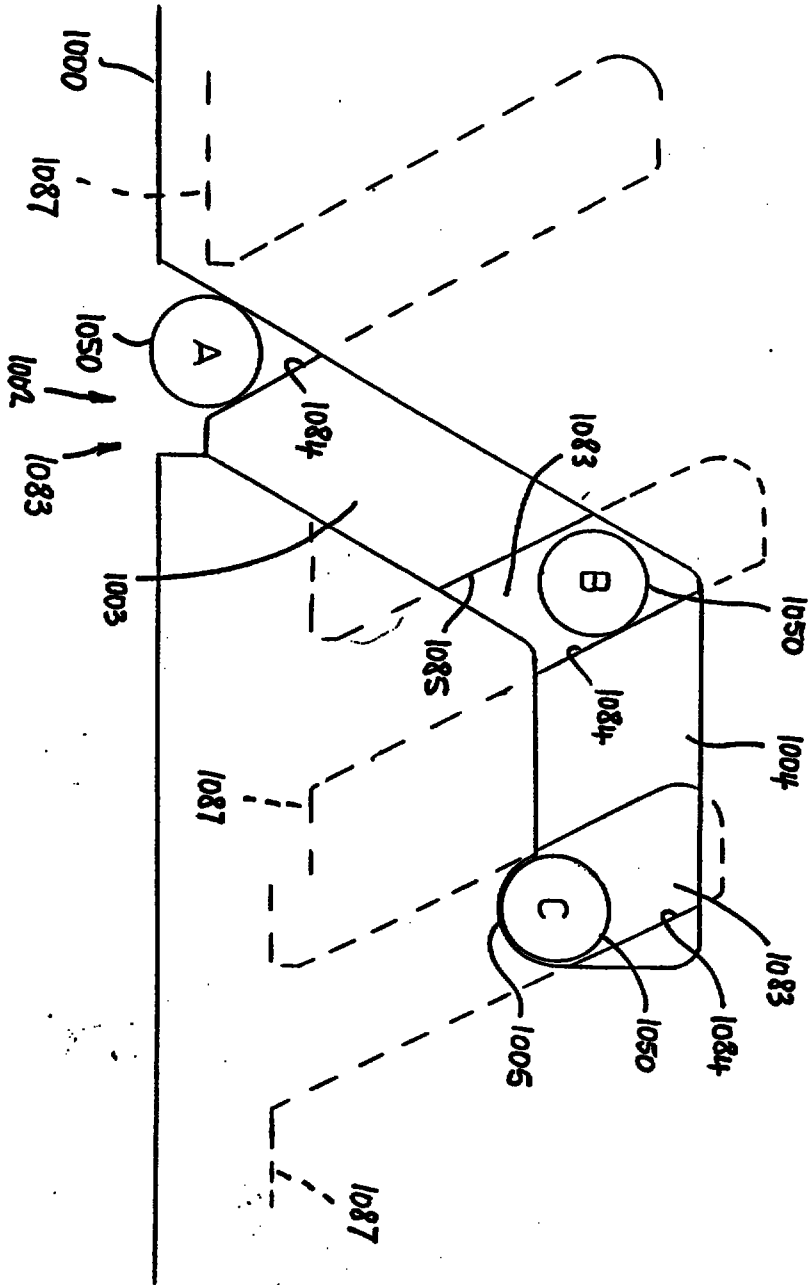


FIG 25



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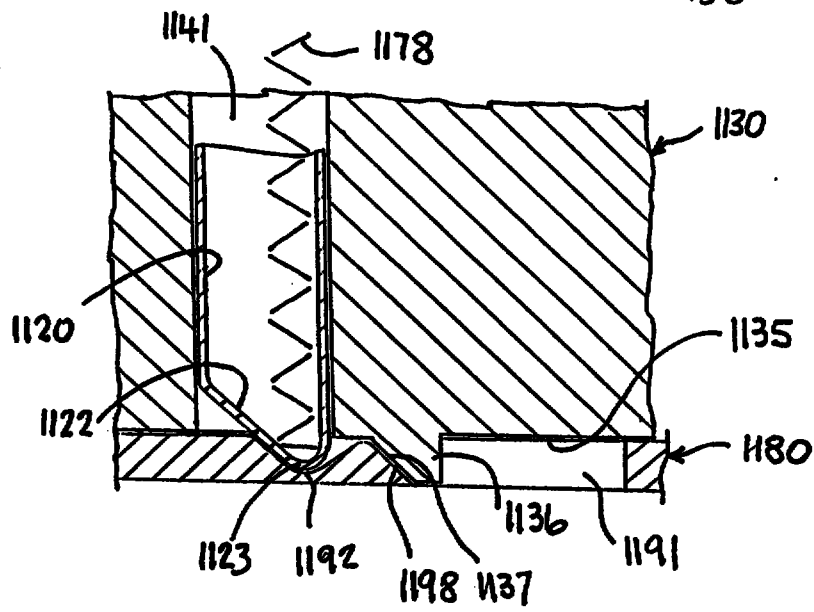


FIG 26

FIG 27

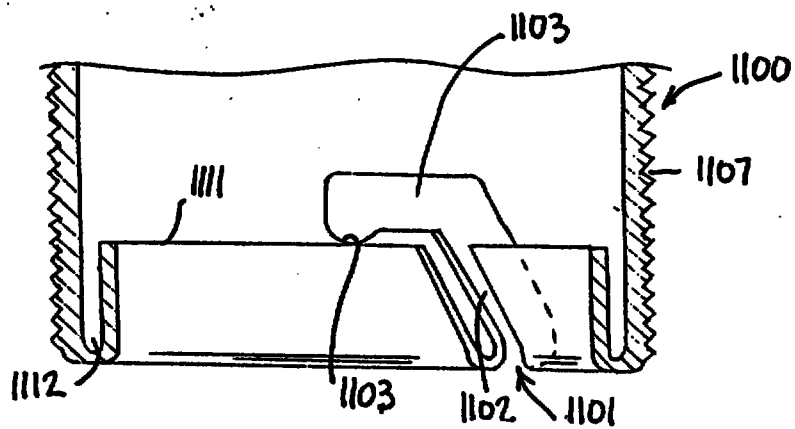
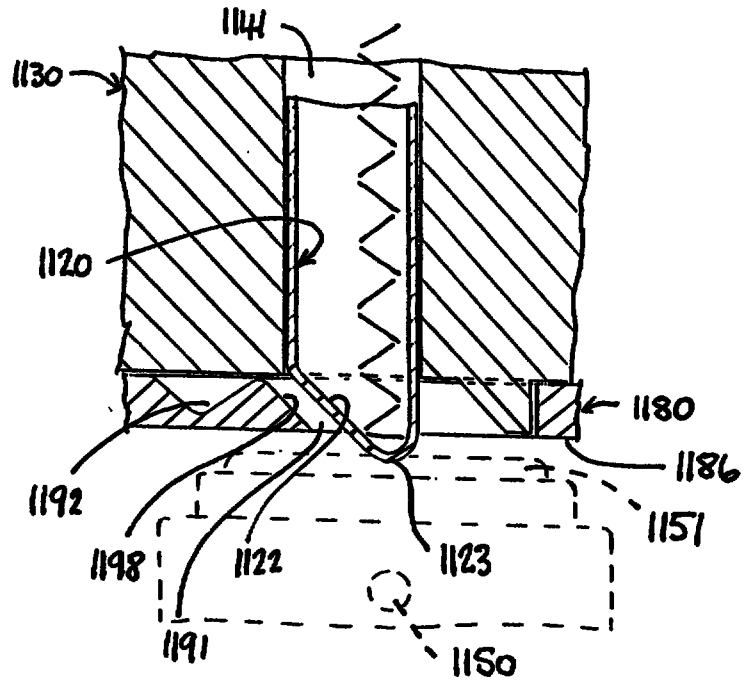


FIG 28

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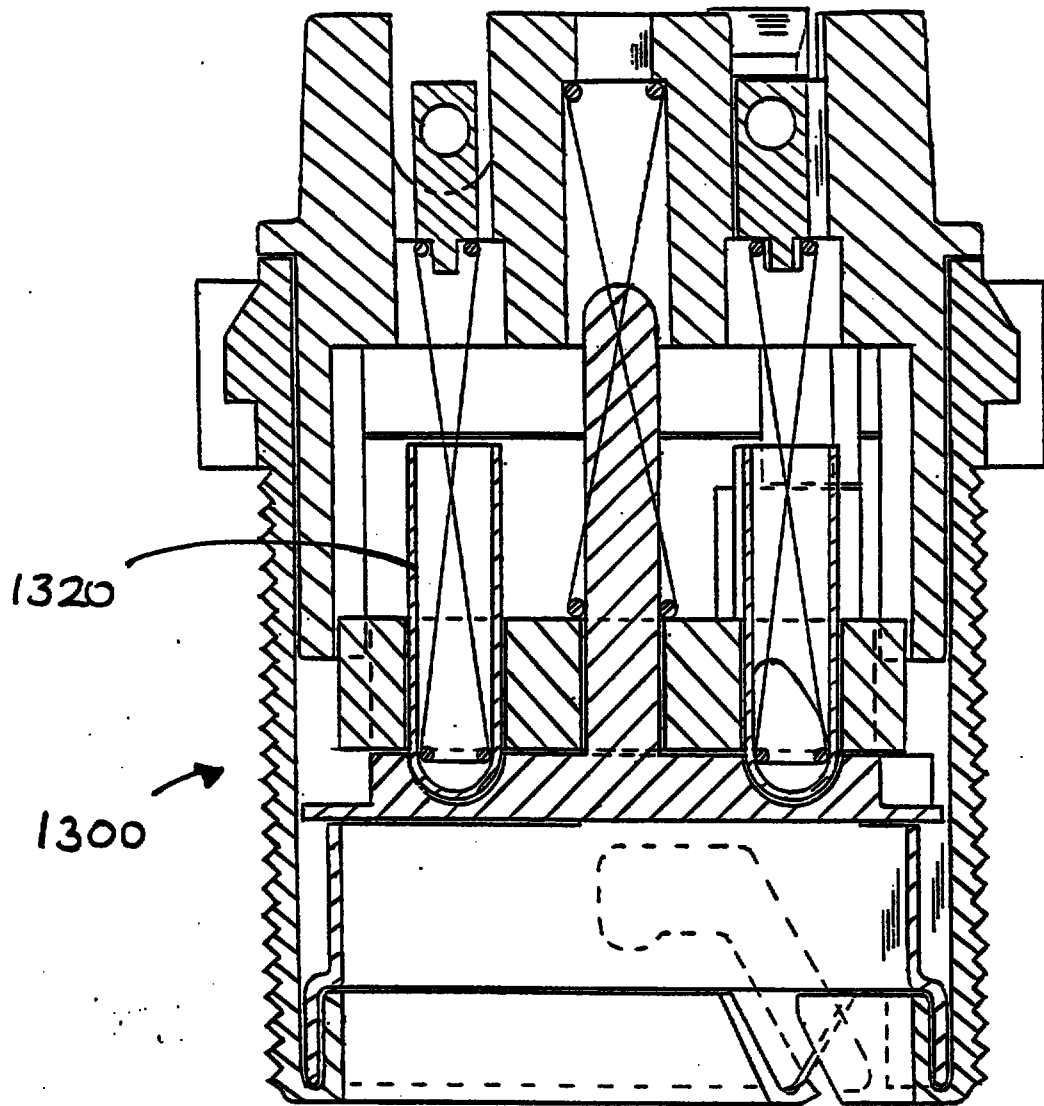


FIG 29

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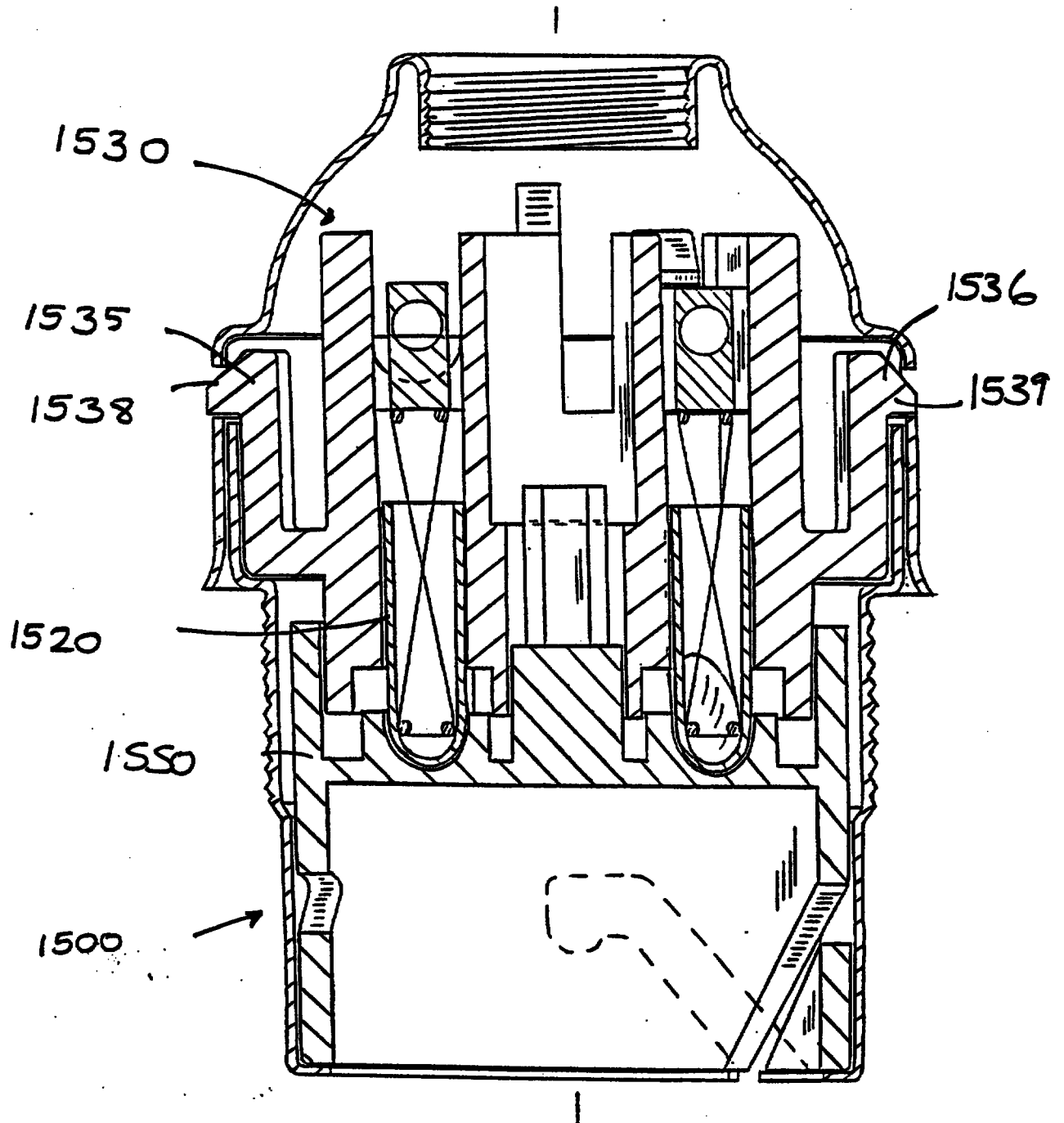


FIG 30

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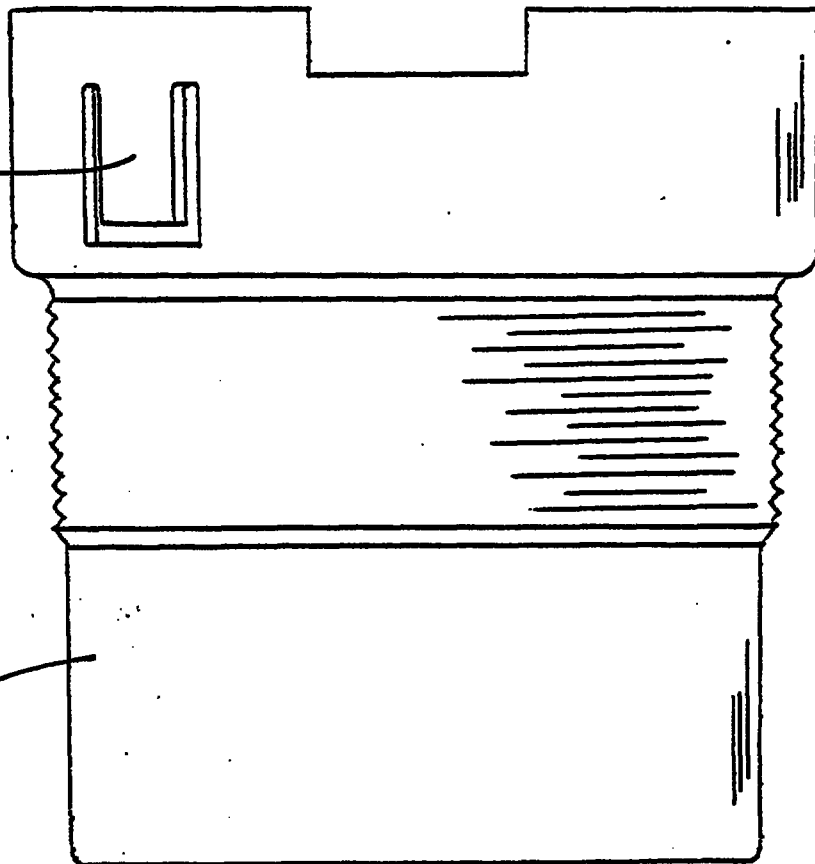
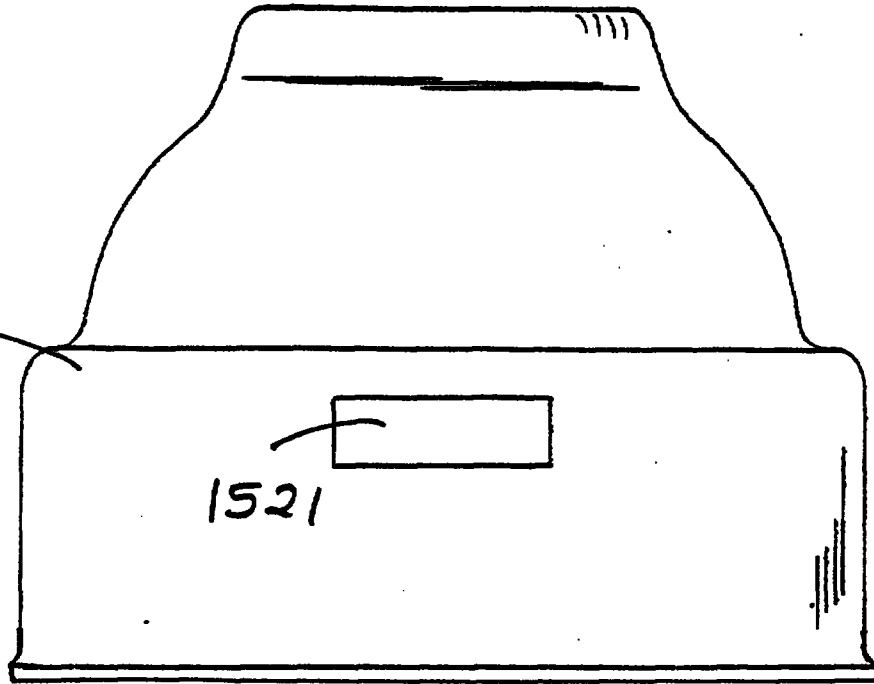
1502

1521

1511

FIG 31

1501



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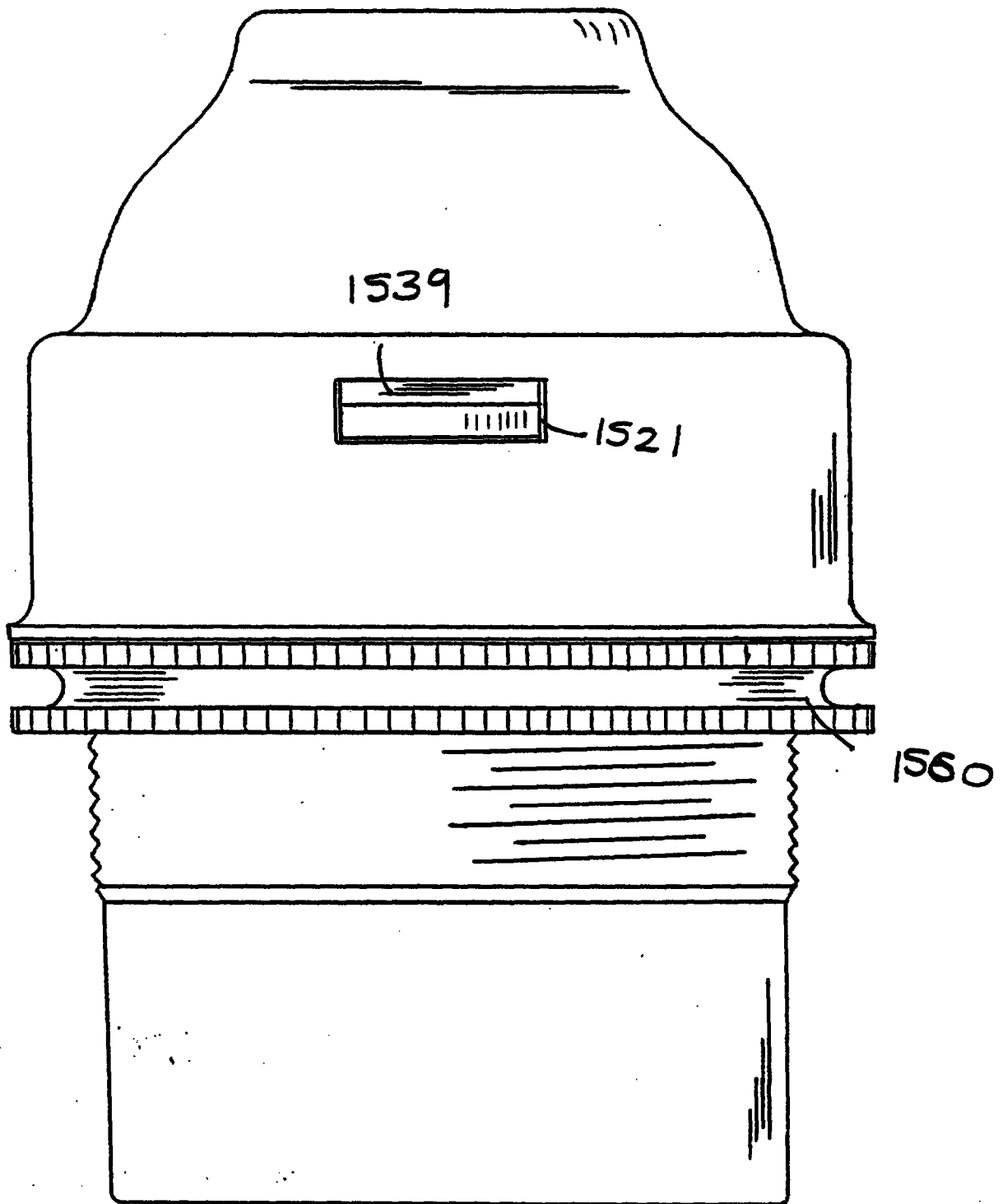


FIG 32

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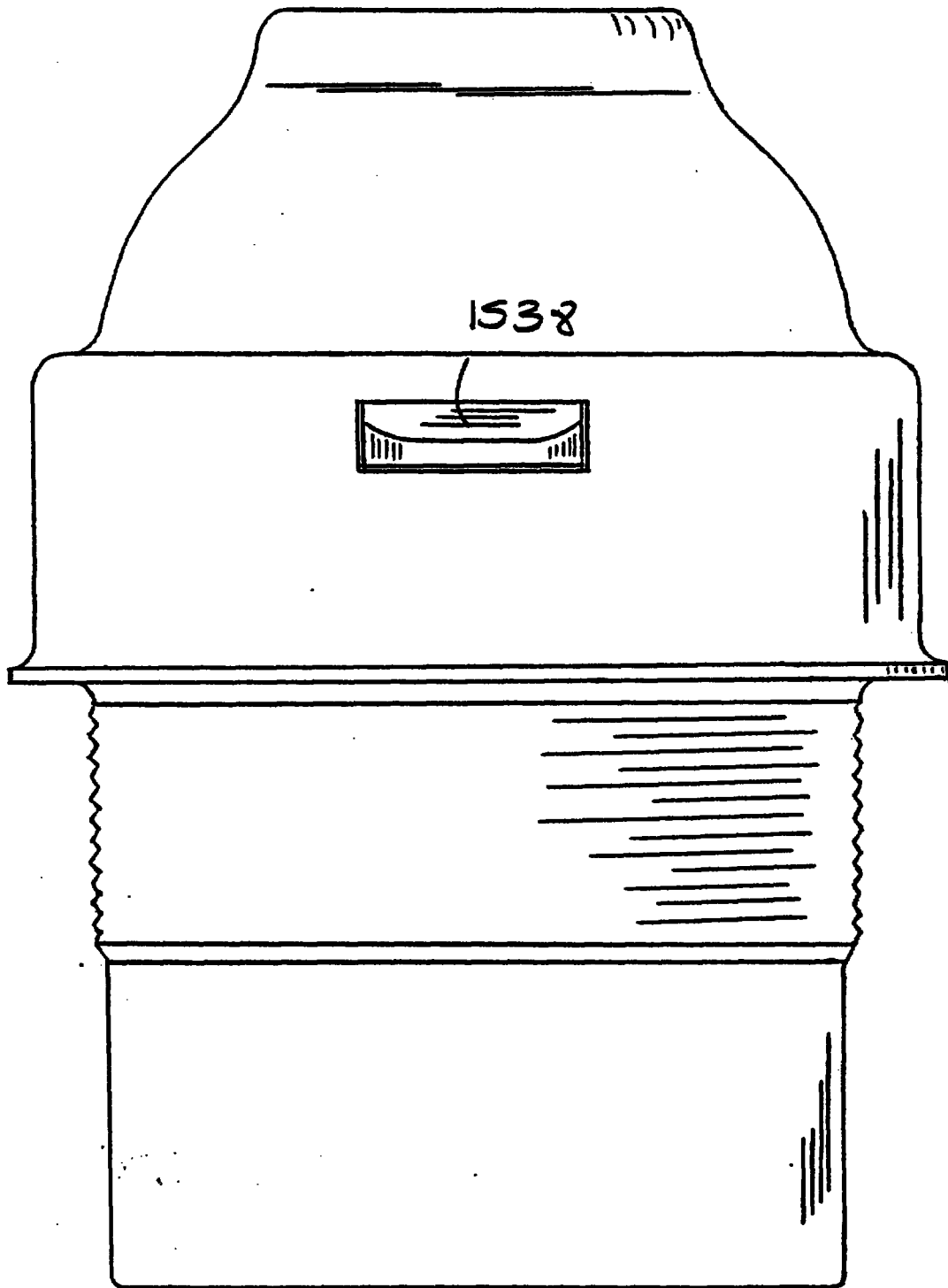


FIG 33

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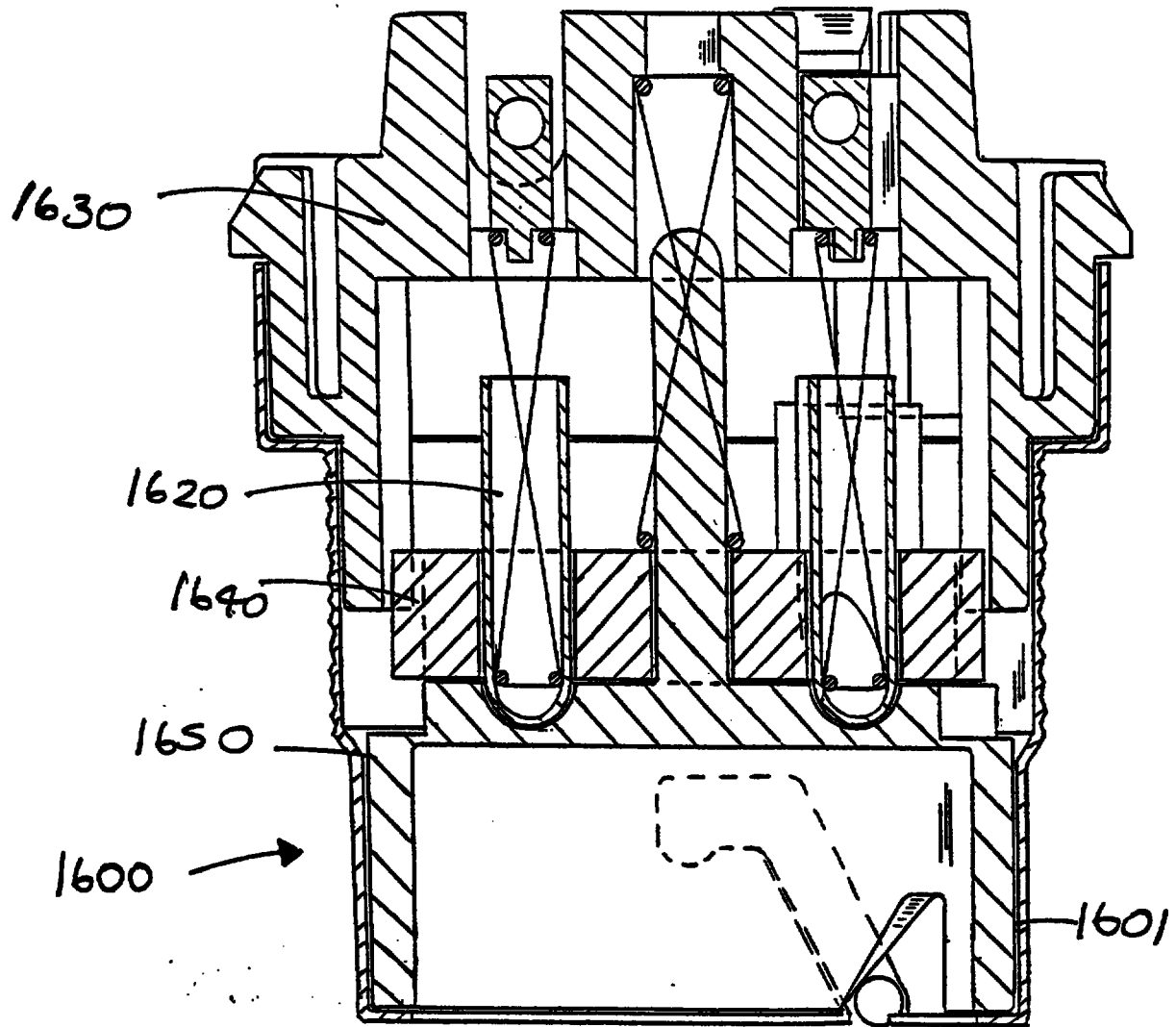


FIG 34

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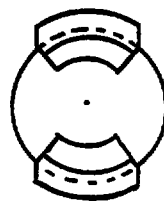
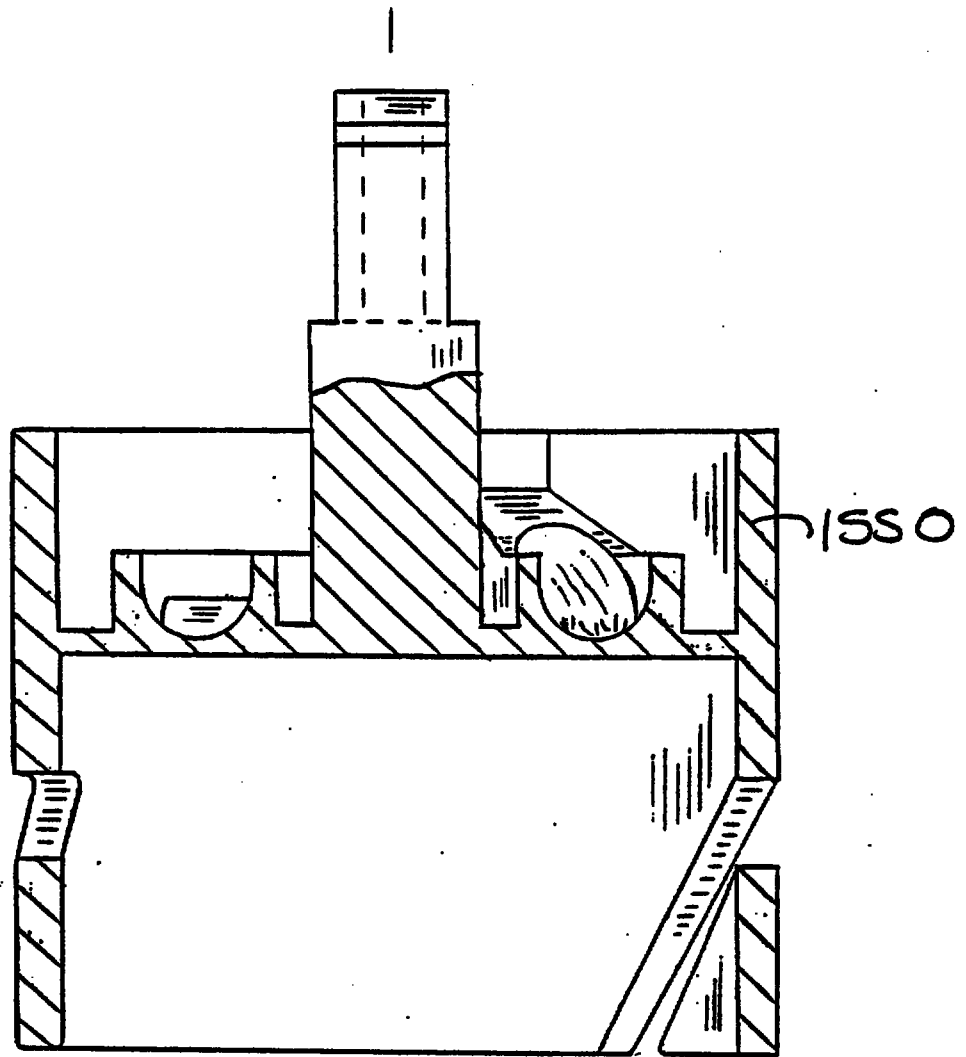


FIG 35

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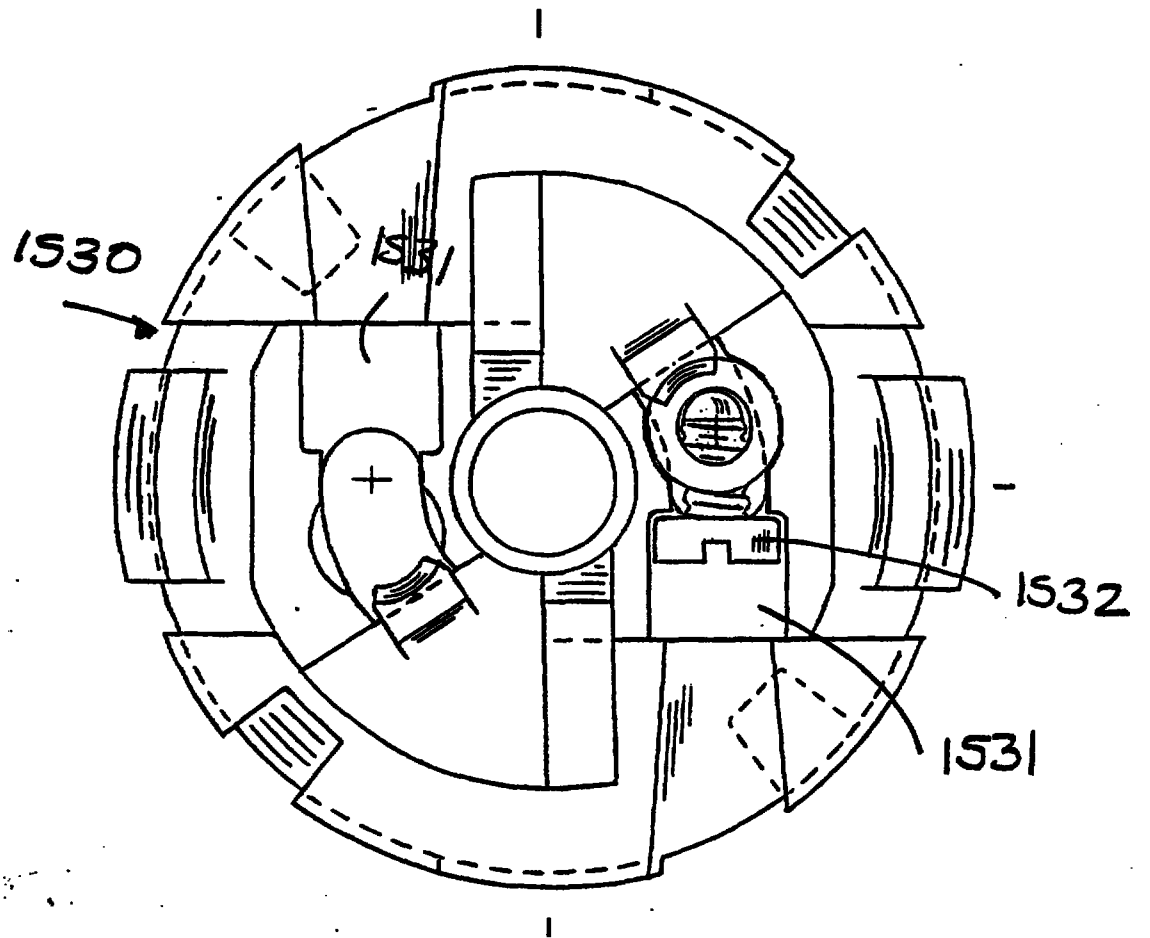


FIG 36



TEXT OF THE ABSTRACT

LAMPHOLDER

A safety lampholder comprises a housing (400) with slots (401) to receive bayonet pins (550) of an inserted bulb. Resilient bulb engaging contacts (520) supply electricity to the inserted bulb. The contacts (520) have ramp formations (522) at their respective free ends. A rotatable apertured shutter means (480) is also located within the housing (400) for selectively obstructing access to the contacts (520). The shutter (480) requires axial and rotational insertion of a bulb to actuate its displacement, between a first inoperative position in which it obstructs the contacts. The contacts are offset from the shutter apertures (492), and a second operative position in which the free ends of the contacts extend through the apertures (492) in the shutter means to bear against an inserted bulb. Both axial and rotational removal of a bulb actuates displacement of the shutter means (480) to drive the contacts (520) inwardly of the housing (400) and against the bias of the contacts (520) to the first inoperative position by interengagement of the shutter means (480) with ramp formations (522) on the contacts.

Fig. 1.

REPLACEMENT SHEET

Date :- 5 DEC 1997