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Kusz

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[45] **Reissued Date of Patent: May 9, 1995**

[54] **CHILD RESISTANT REMINDER CLOSURE**

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[73] Assignee: **Owens Illinois Closure Inc.,** Toledo, Ohio

[21] Appl. No.: **83,818**

[22] Filed: **Jun. 28, 1993**

Related U.S. Patent Documents

Reissue of:

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Issued: **Feb. 9, 1993**
Appl. No.: **878,647**
Filed: **May 5, 1992**

[51] **Int. Cl.**[6] **B65D 55/02**

[52] **U.S. Cl.** **215/220;** 215/230; 206/534; 116/308

[58] **Field of Search** 215/219, 220, 230; 206/534; 116/308

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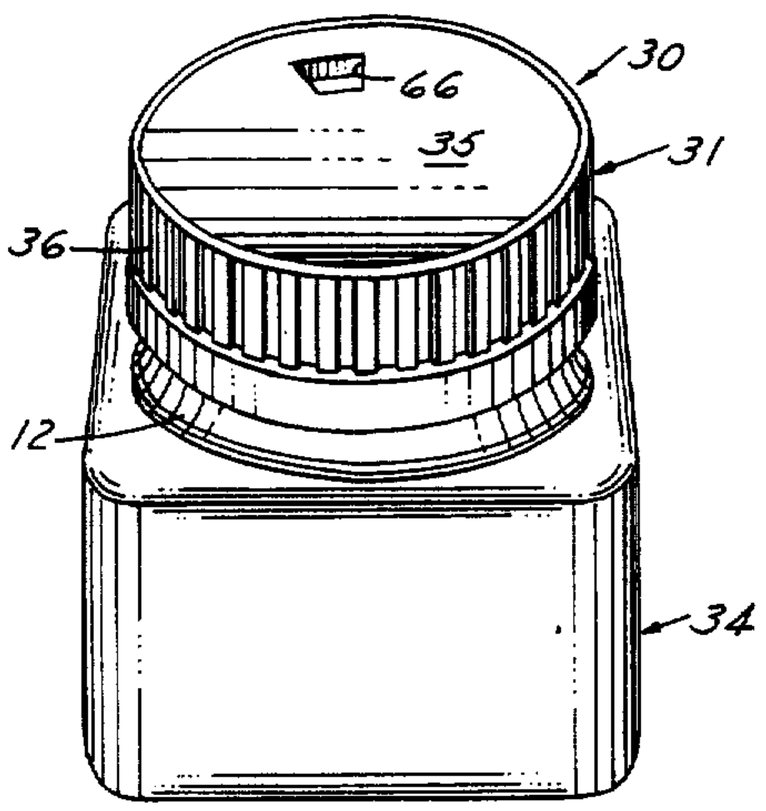
Primary Examiner—Allan N. Shoap
Assistant Examiner—Nova Stucker

[57] **ABSTRACT**

A child resistant reminder closure comprising an outer closure member having a base wall and a peripheral skirt, an inner closure member having a base wall and peripheral skirt with a bead on the outer closure member retaining the inner closure member against limited axial outward movement relative to the outer closure member. An assembly of a day disk and an indexing disk is provided in the outer closure member and is rotatable relative thereto. A first set of flexible radial ratcheting fingers extend radially from the day disk and engage radial lugs on the undersurface of the base wall of the outer closure member. A second set of flexible radial ratcheting fingers extend radially from the day disk and engage circumferentially spaced lugs on the upper surface of the indexing disk. Axially interengageable lugs and recesses are provided on the outer closure member and the indexing disk and interengaging lugs and recesses are provided between the indexing disk and inner closure member which are interengaged to remove the closure or to apply the closure to s container thereby providing a child resistant feature. A window is provided on the outer closure member and is associated with indicia on the day disk to indicate the circumferential position of the outer closure member relative to the day disk.

9 Claims, 7 Drawing Sheets



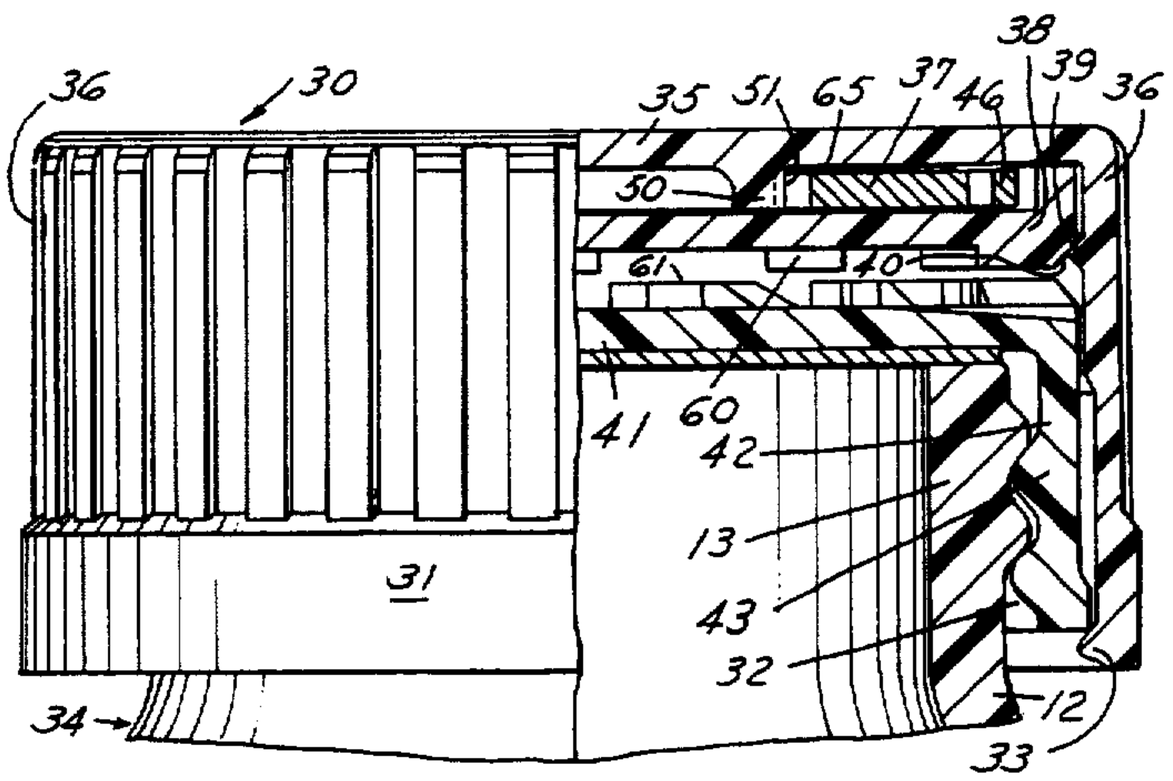


FIG.1

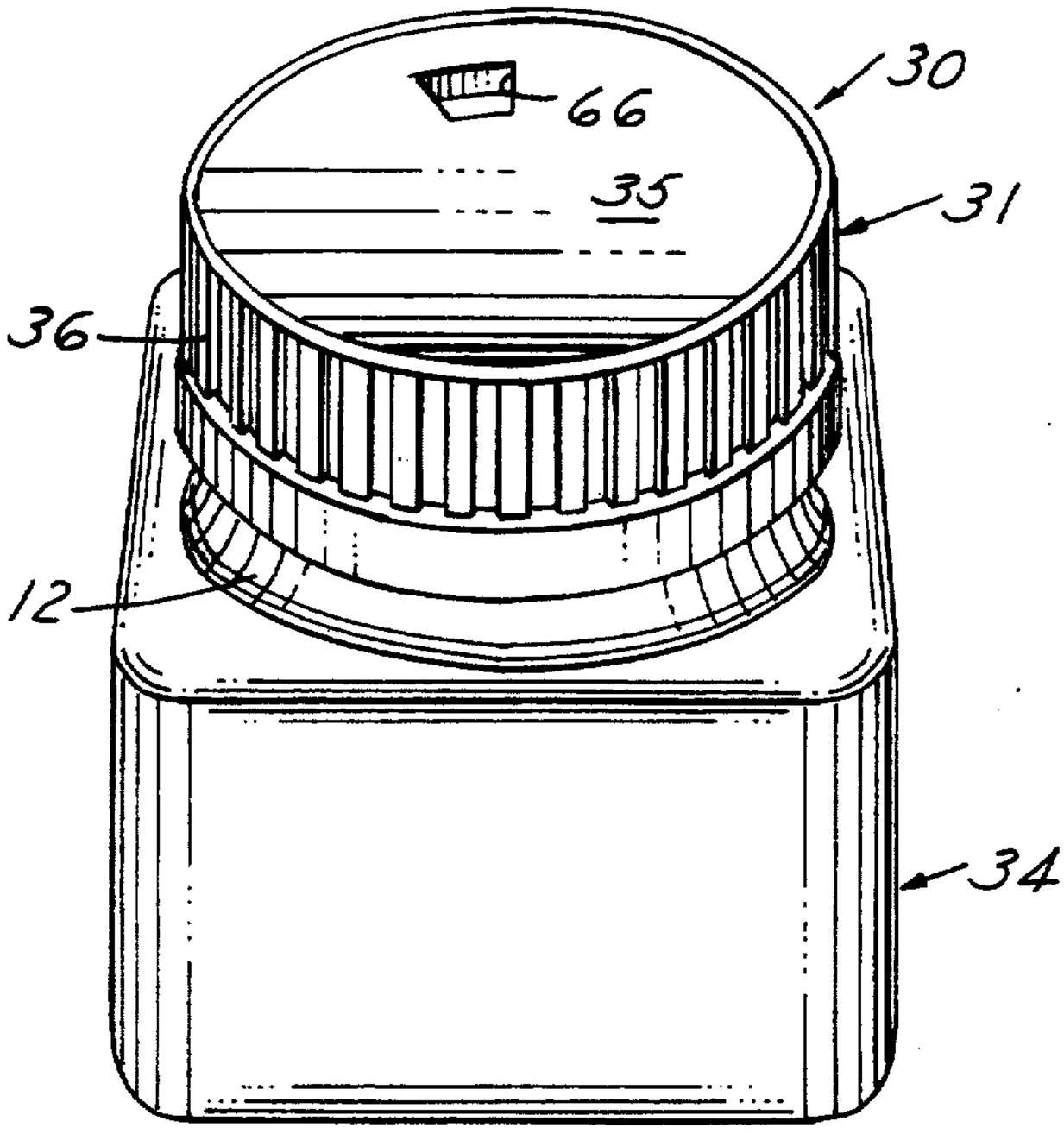

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FIG.2

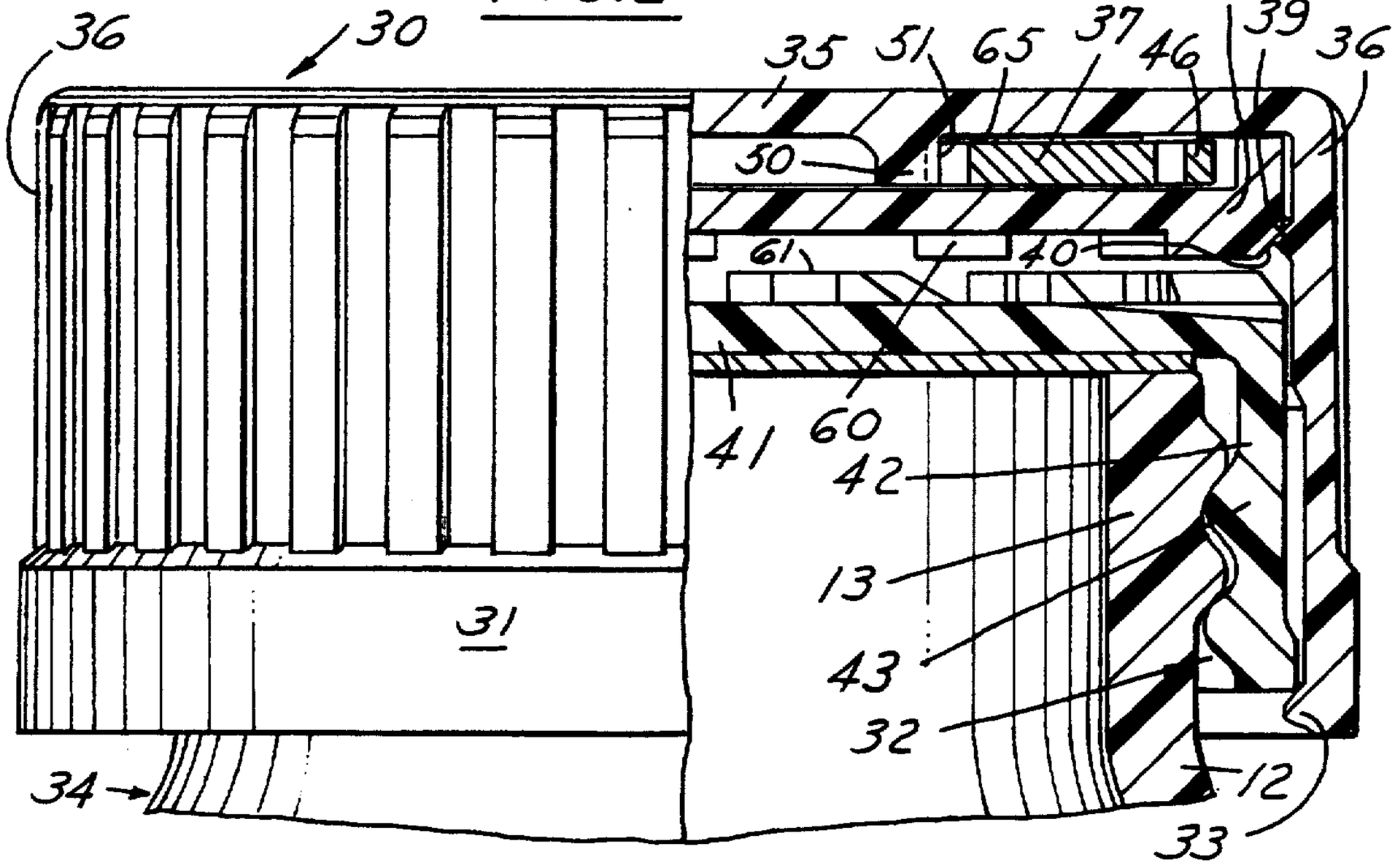
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FIG. 3

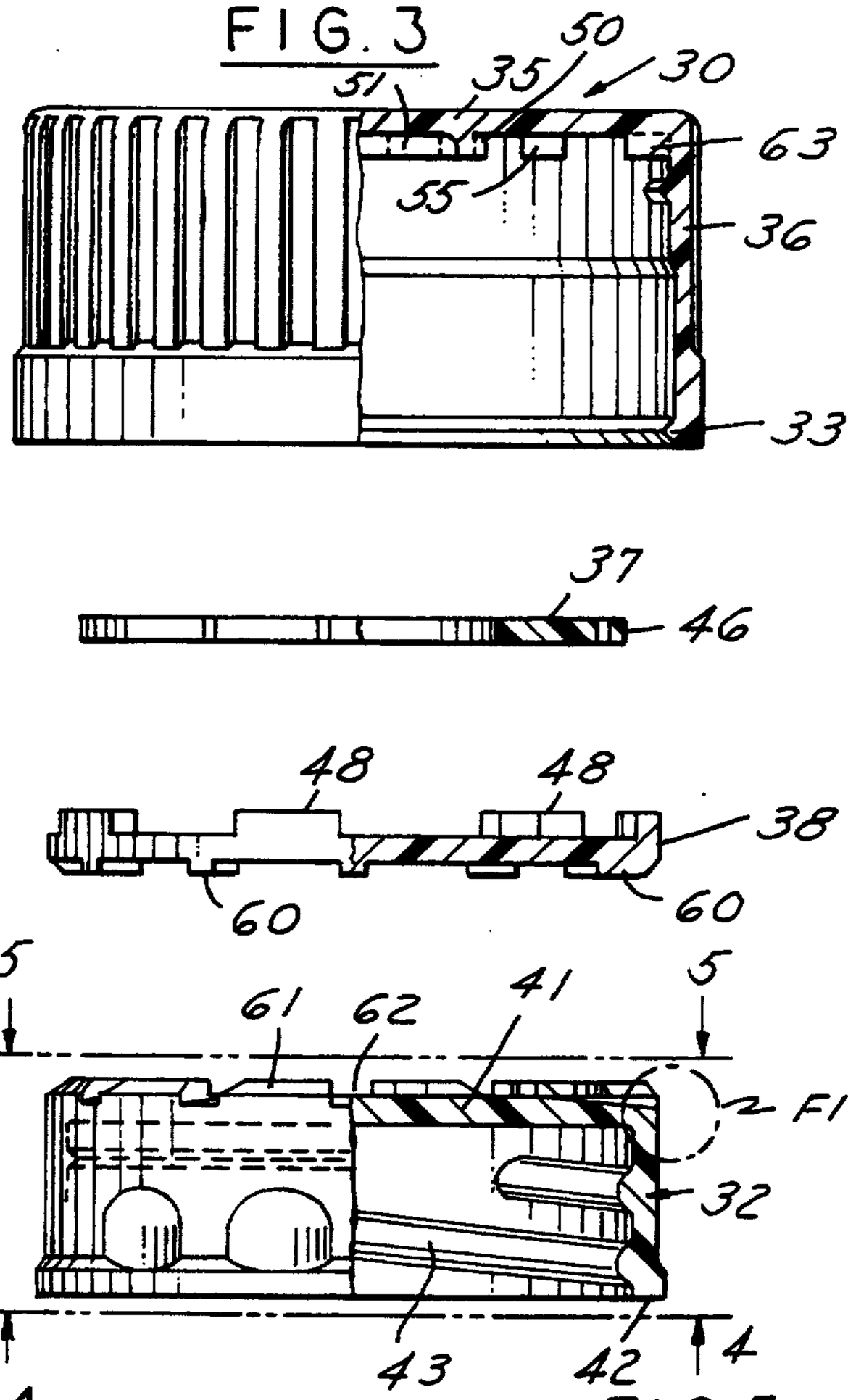


FIG. 4

FIG. 5

FIG.6

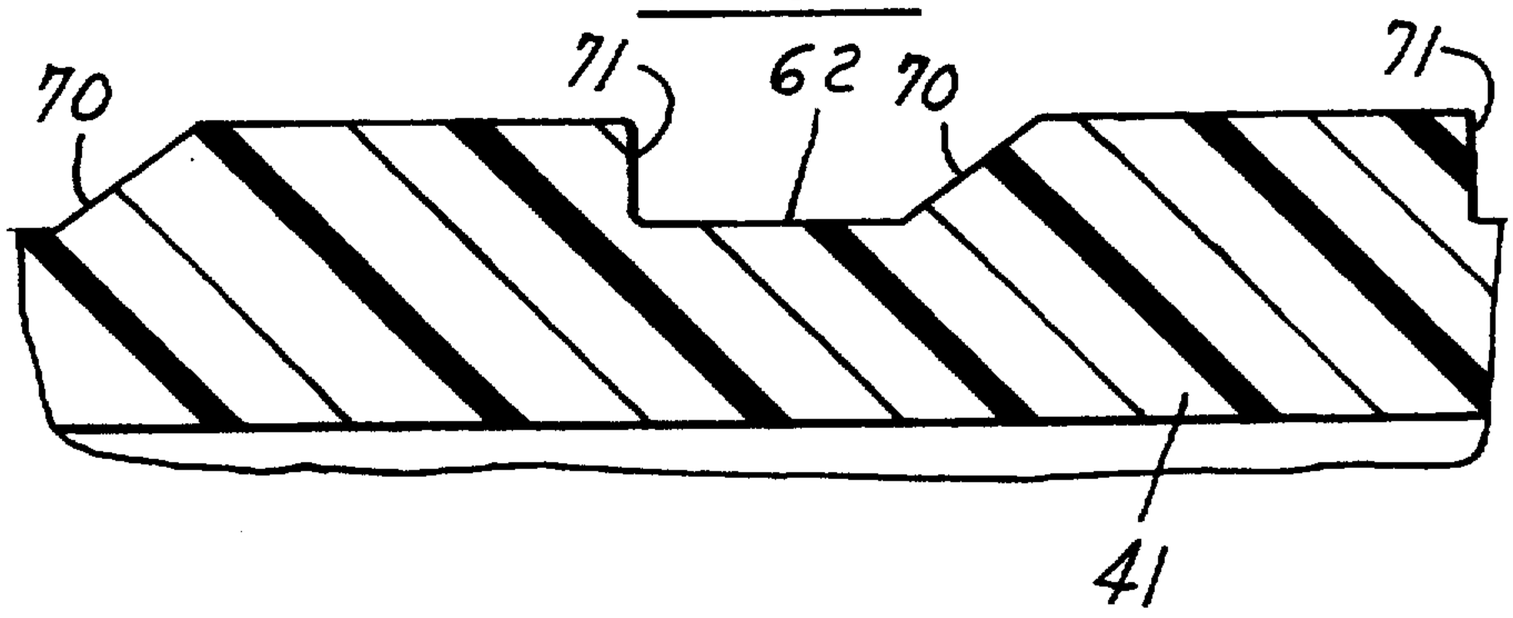


FIG.7

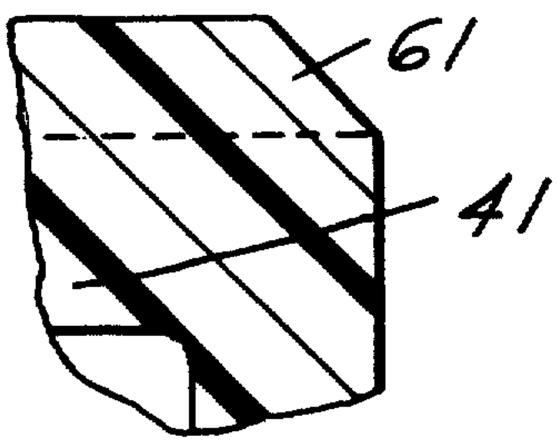


FIG.8

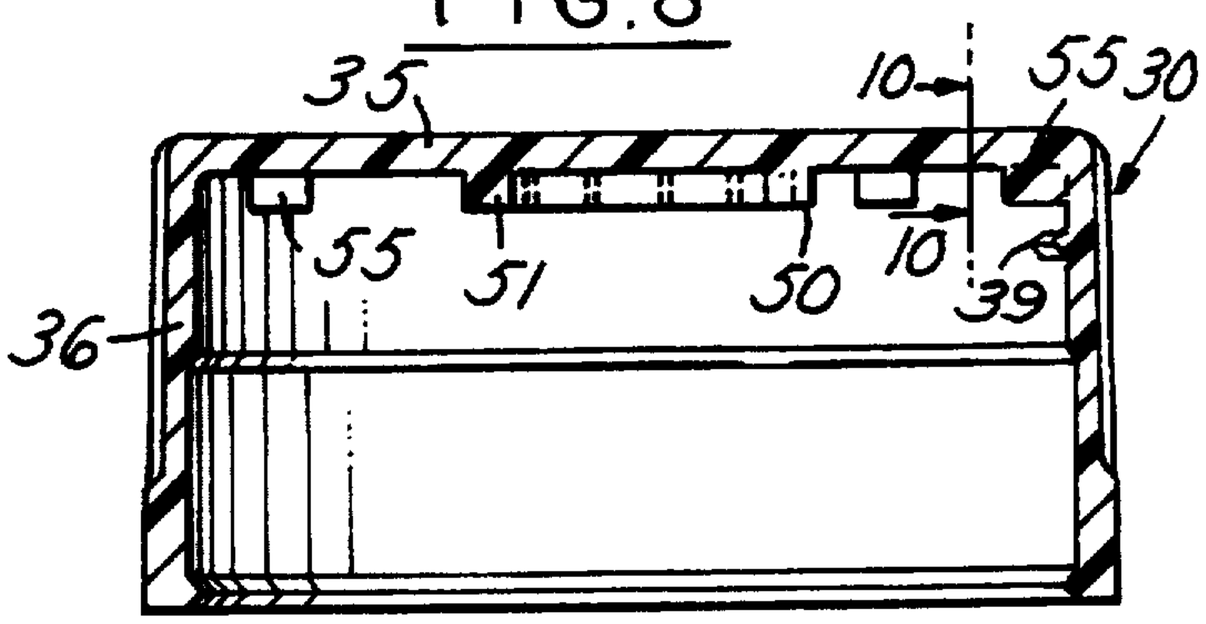
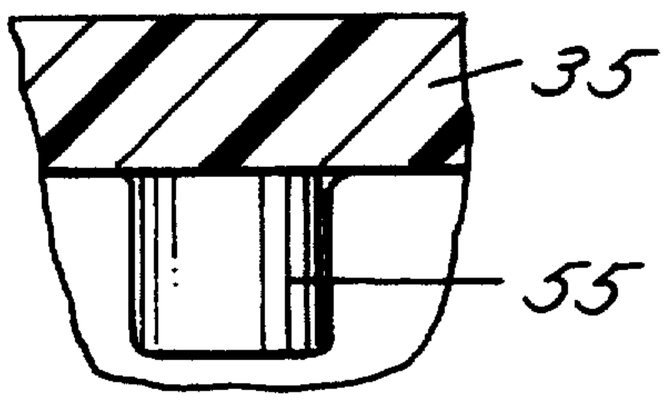


FIG.10



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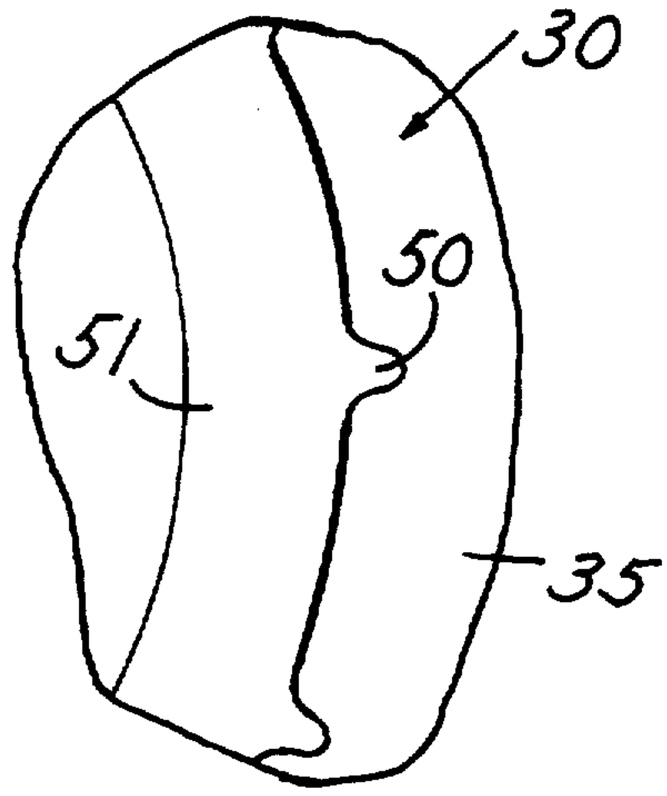


FIG.9

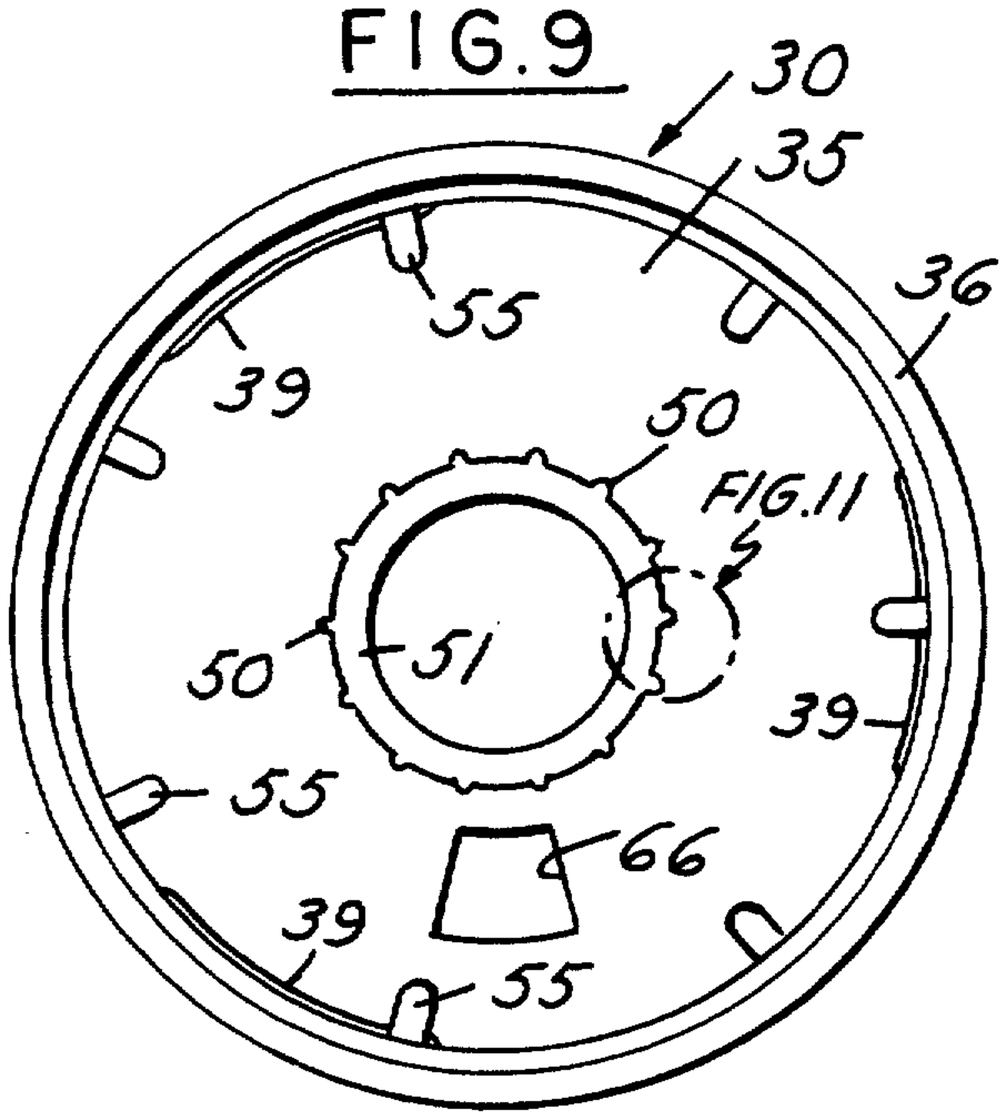
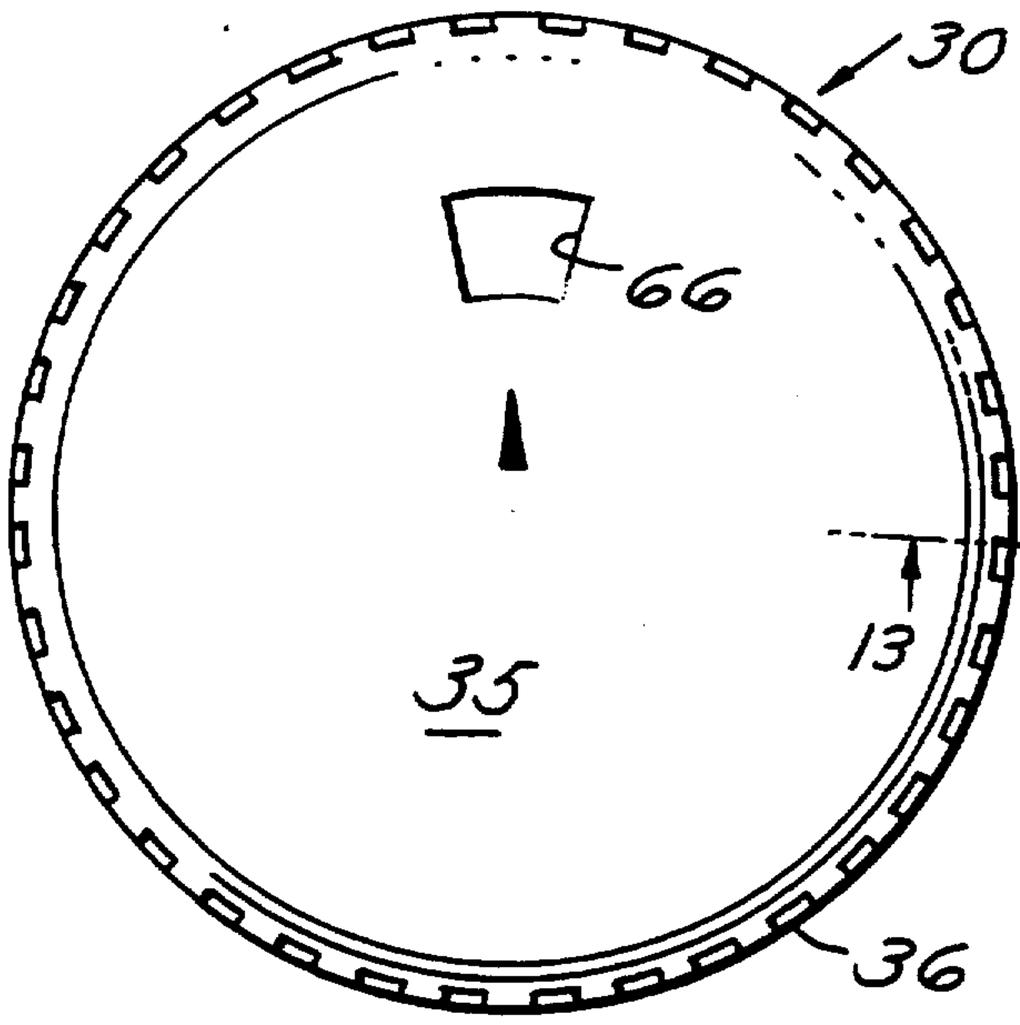


FIG.12



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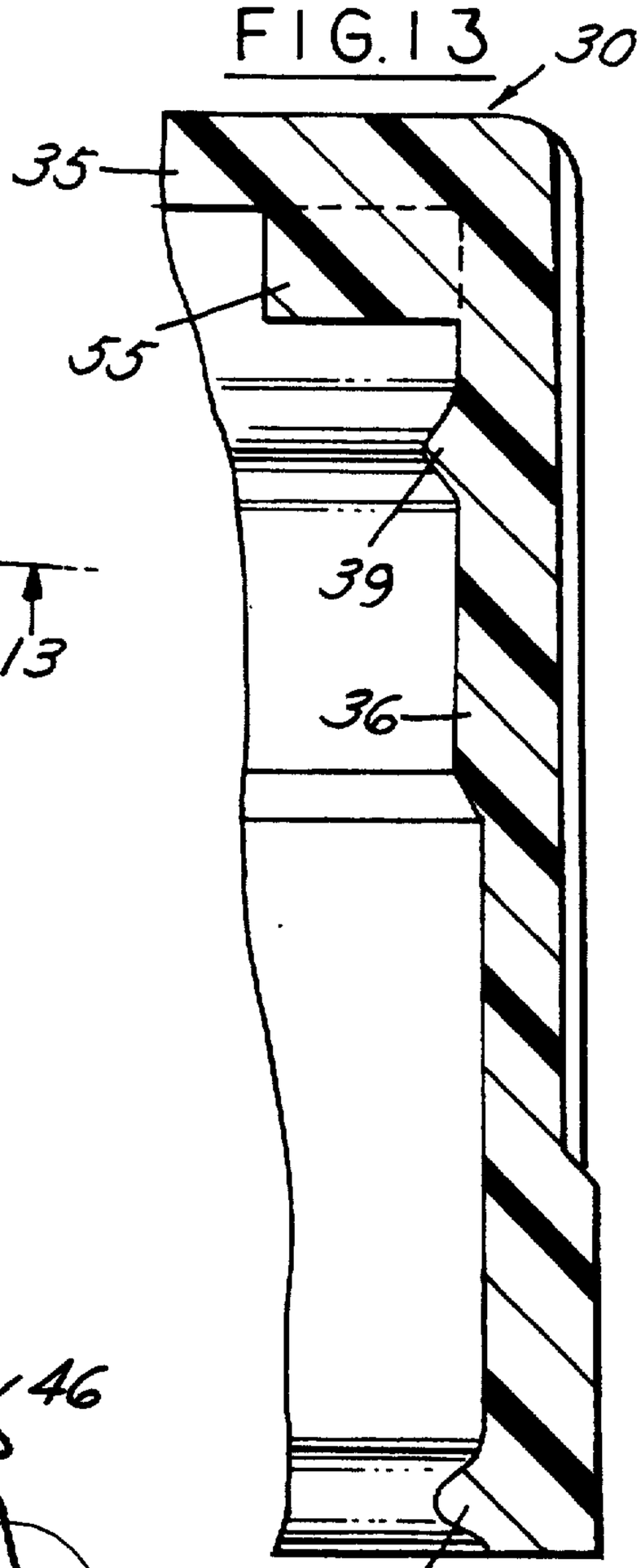

FIG.14

FIG.15

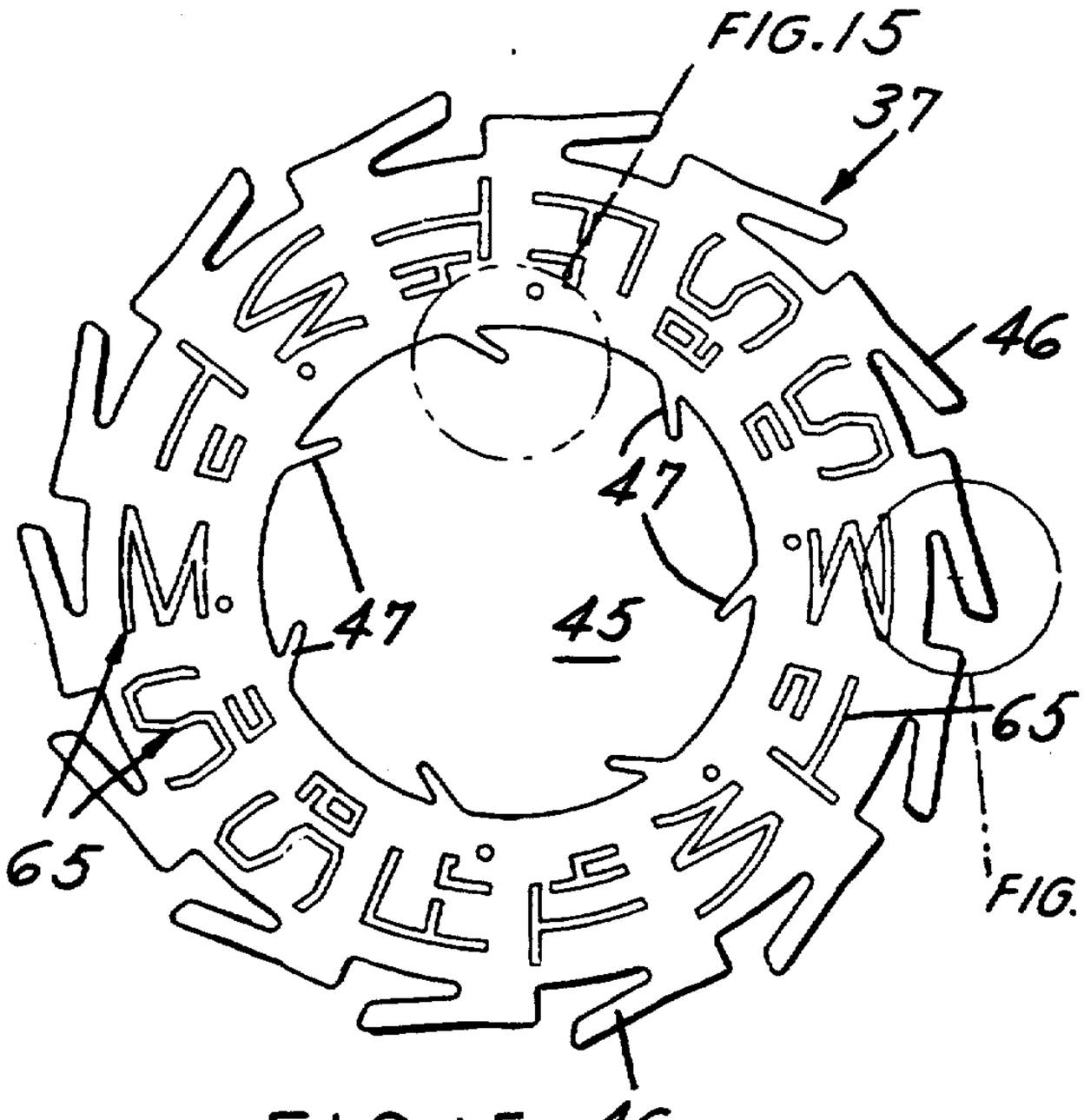

FIG.16

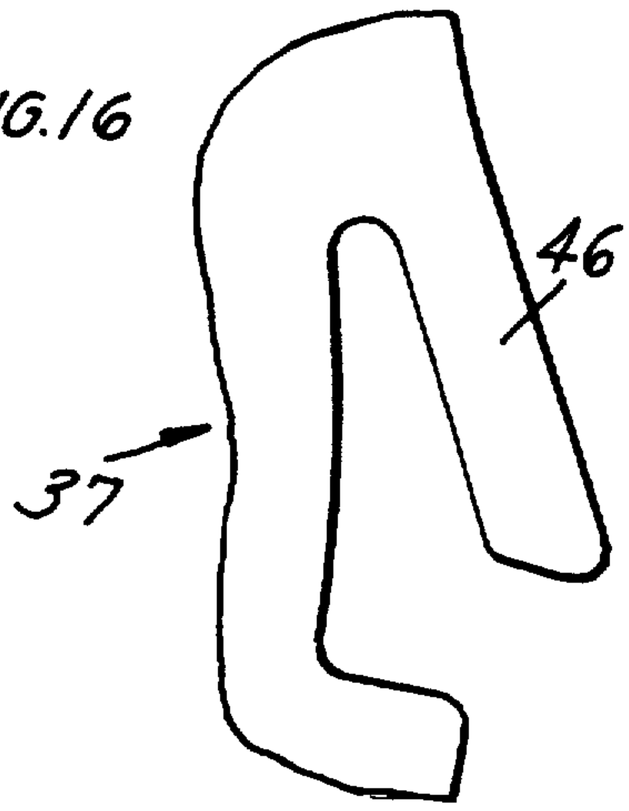

FIG.15

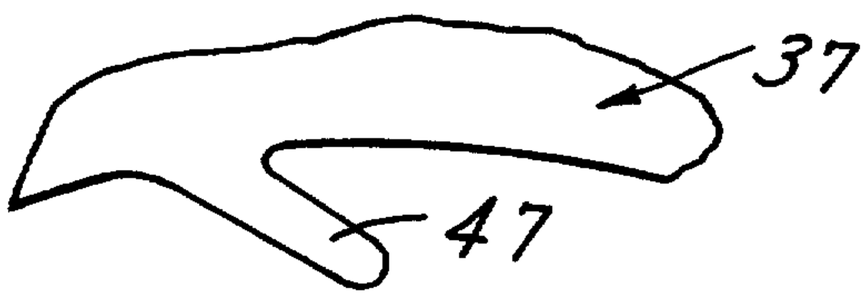

FIG. 17

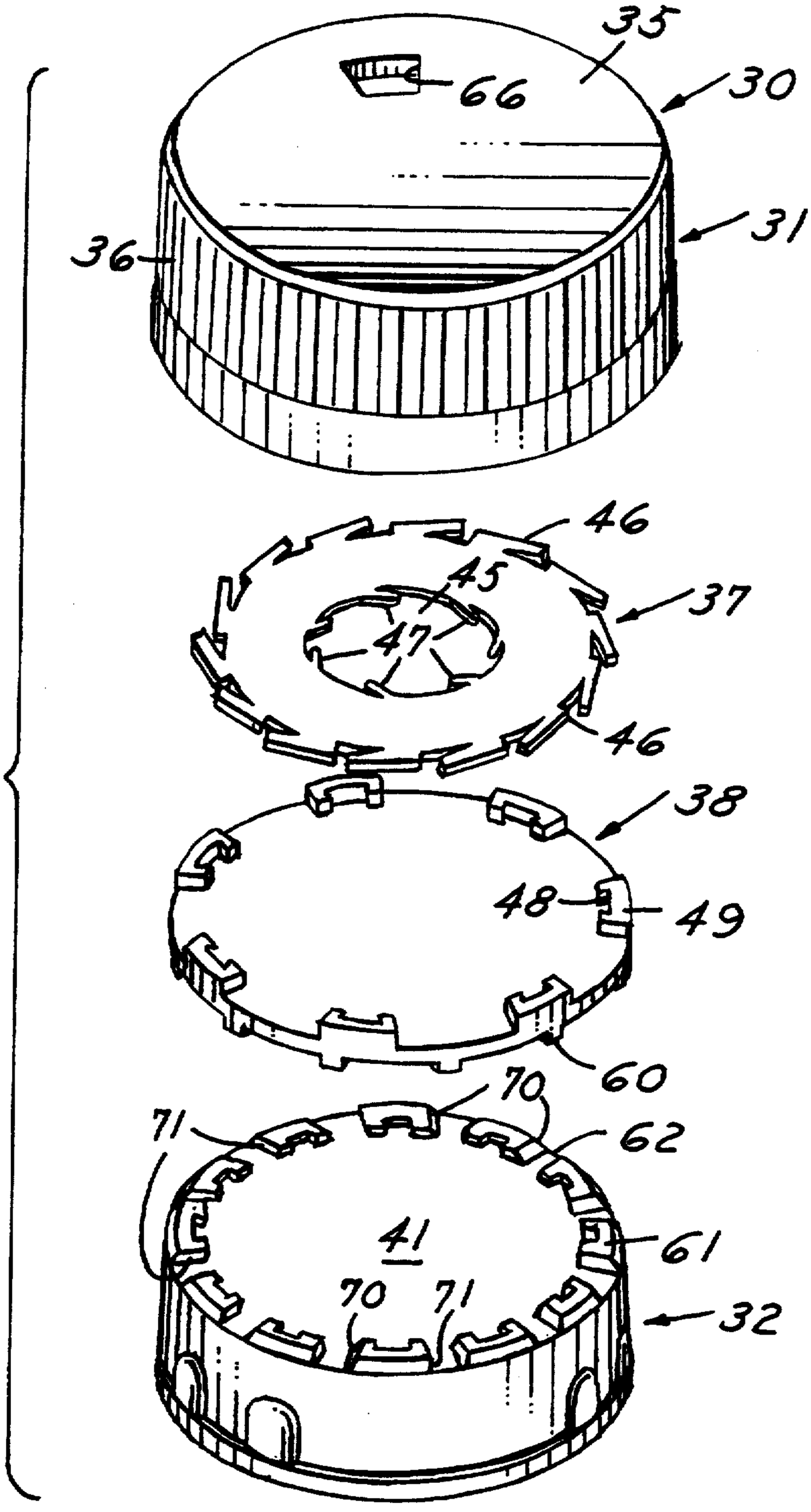

FIG. 18

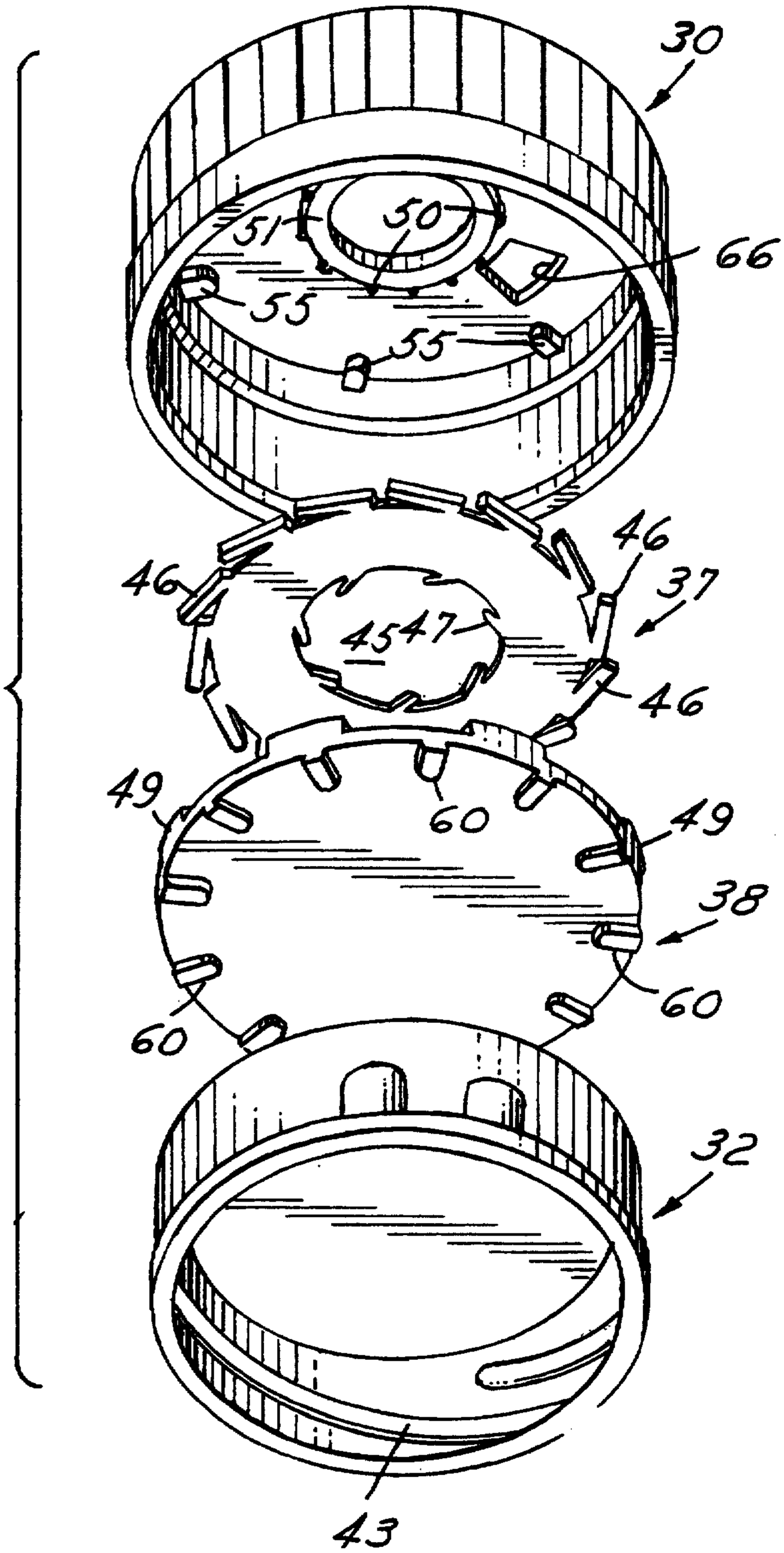

FIG. 19

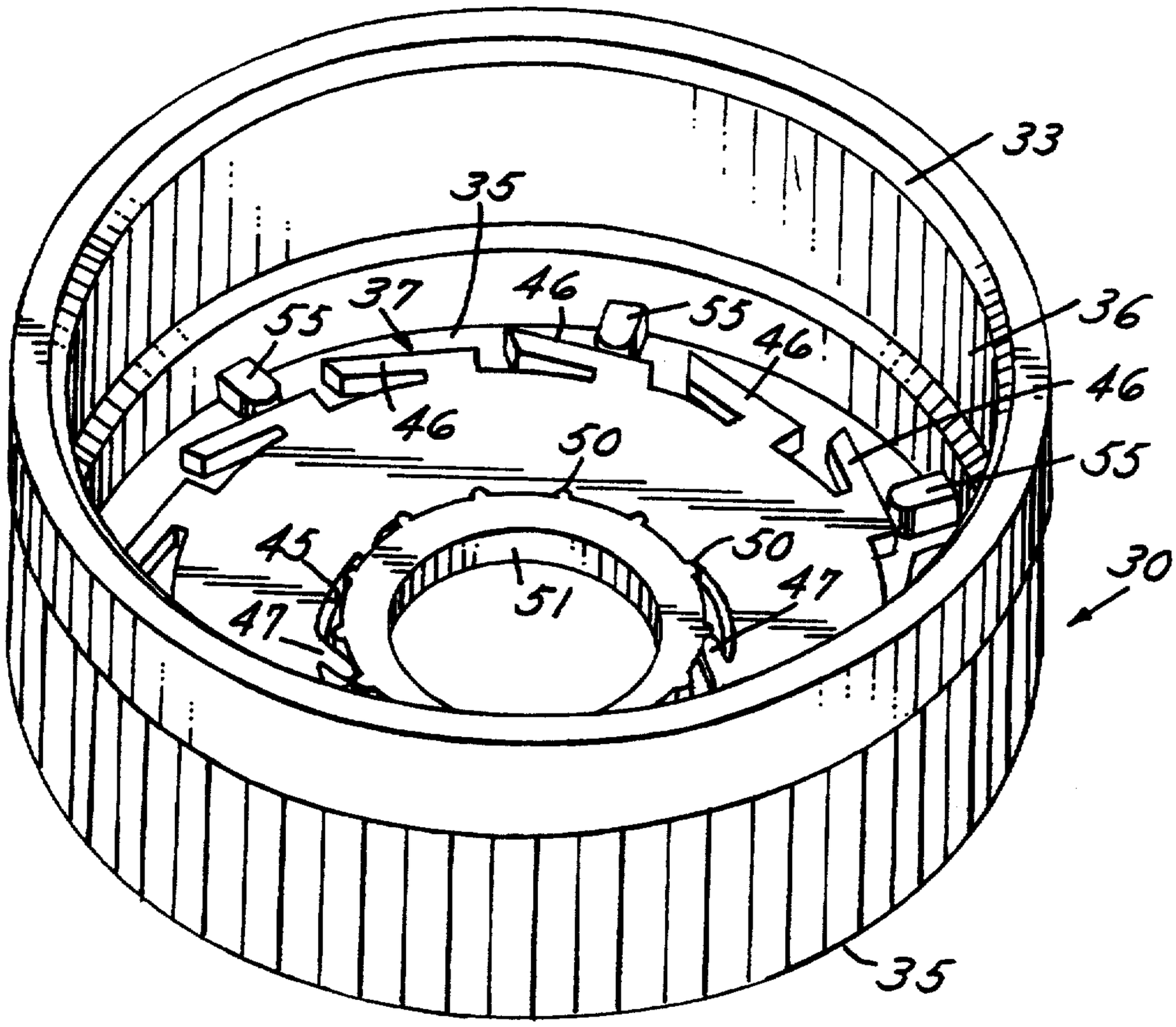
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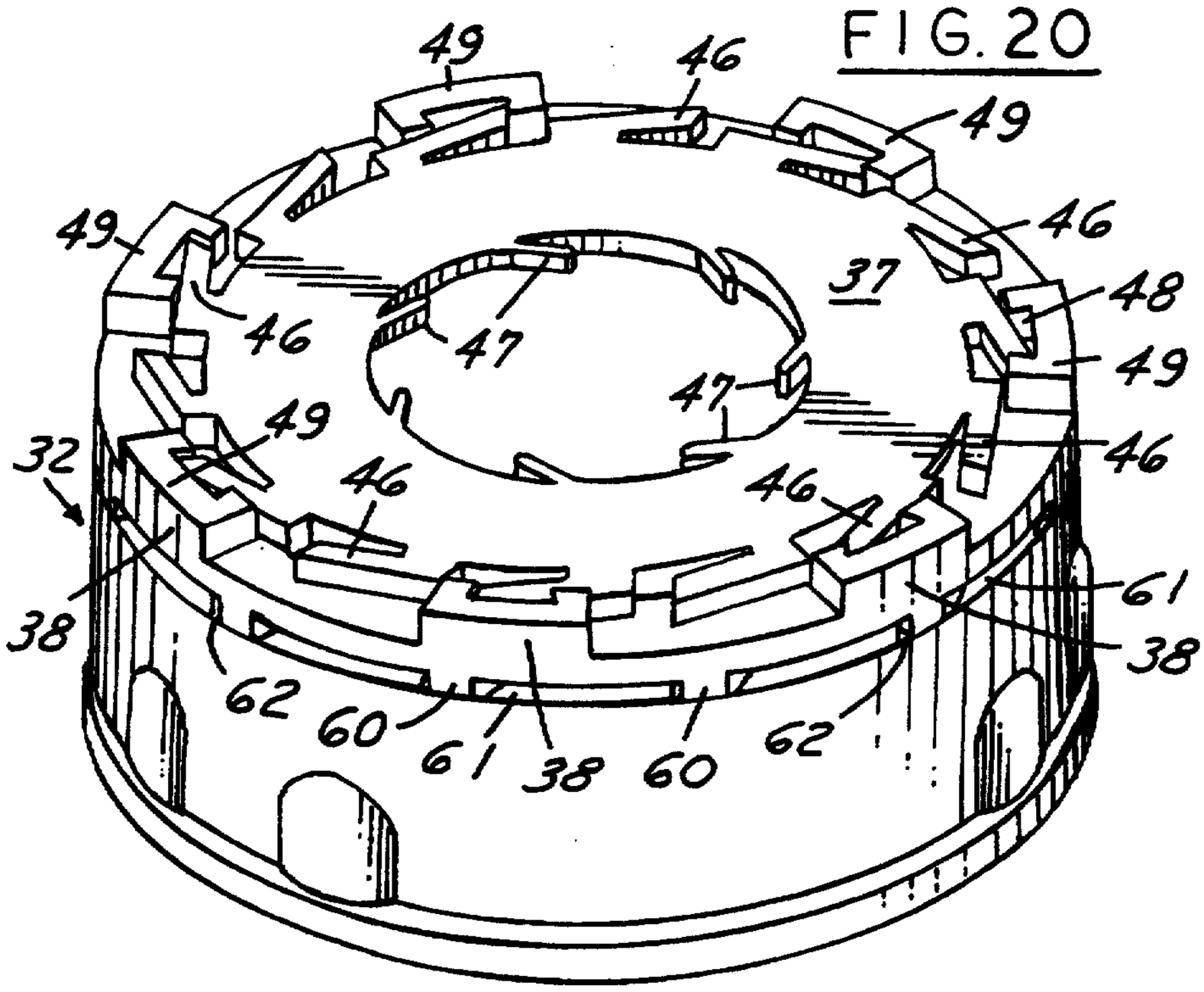
FIG. 20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CHILD RESISTANT REMINDER CLOSURE

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This invention relates to child resistant reminder closures.

BACKGROUND AND SUMMARY OF THE INVENTION

Regular use or maintenance of prescription drugs has become important in ensuring the health of users thereof and is being stressed and advocated by health authorities and governmental agencies such as the United States Food and Drug Administration. To comply with a regimen, it is helpful to remember when the person taking the medication last took the medication. One way of helping in this regard is to have a closure with a visual indicator of when the closure package was last opened or when the package should be opened next.

Current compliance closures use expensive battery operated indicators. Others use mechanical constructions that are complex and costly.

Typical closures of the mechanical type are shown in U.S. Pat. Nos. 3,151,599, 4,011,829, 4,365,722 and 5,009,338. Such closures have the disadvantage that they require axial movement between the reminder components. The axial movement between an outer closure member and an inner closure member to a child resistant closure would not permit such normal axial movement between the components or such reminder closures. In addition, relative axial movement and rotation between the reminder components can cause wear and obliteration of the indicia.

Among the objectives of the present invention are to provide a child resistant reminder closure of the mechanical type which is reliable; which functions to repeatedly provide the desired information; which do not incorporate axial forces between the reminder components; wherein the components are reversible so that the change in visible indicia can be made either on application or removal of the closure; which utilizes old and well known child resistant construction; and which can be manufactured readily in high-production.

In accordance with the invention, a child resistant reminder closure comprising an outer closure member having a base wall and a peripheral skin, an inner closure member having a base wall and a peripheral skin with a bead on the outer closure member retaining the inner closure member against limited axial outward movement relative to the outer closure member. An assembly of a day disk and an indexing disk is provided on the outer closure member and is rotatable relative thereto. The day disk is provided adjacent the inner surface of the base wall of the outer closure member and is mounted on the underlying indexing disk. A first set of flexible radial ratcheting fingers extend radially from the day disk and engage radial lugs on the undersurface of the base wall of the outer closure member. A second set of flexible radial ratcheting fingers extend radially from the day disk and engage circumferentially spaced lugs on the upper surface of the indexing disk. Axially interengageable lugs and recesses are provided on the outer closure member and the indexing disk and interengaging lugs and recesses are provided between the underside of the indexing disk and the inner closure member which are adapted to be engaged to remove or apply the closure from a container thereby providing a child resistant feature. A window is provided on the outer closure member and is associated with indicia on the day disk to indicate the circumferential position or the outer closure member relative to the day disk.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a child resistant package with a reminder closure.

FIG. **2** is a part sectional view on a greatly enlarged scale showing the closure.

FIG. **3** is a part sectional exploded view of the closure.

FIG. **4** is a bottom plan view taken along the line **4—4** in FIG. **3**.

FIG. **5** is a top plan view taken along the line **5—5** in FIG. **3**.

FIG. **6** is a fragmentary sectional view on an enlarged scale taken along the line **6—6** in FIG. **5**.

FIG. **7** is a fragmentary sectional view on an enlarged scale taken at line **7** in FIG. **3**.

FIG. **8** is a sectional view or the outer closure member shown in FIG. **3**.

FIG. **9** is a bottom plan view of the outer closure member shown in FIG. **8**.

FIG. **10** is a fragmentary sectional view taken along the line **10—10** in FIG. **8**.

FIG. **11** is a fragmentary view on an enlarged scale taken along the line **11—11** in FIG. **10**.

FIG. **12** is a top plan view of the outer closure shown in FIG. **8**.

FIG. **13** is a fragmentary sectional view on an enlarged scale taken along the line **13—13** in FIG. **12**.

FIG. **14** is a plan view of an indexing ring.

FIG. **15** is a fragmentary view on an enlarged scale taken along the line **15—15** in FIG. **14**.

FIG. **16** is a fragmentary view on an enlarged scale taken along the line **16—16** in FIG. **14**.

FIG. **17** is a top perspective exploded view of the closure embodying the invention.

FIG. **18** is a bottom exploded perspective view of the closure.

FIG. **19** is a bottom perspective view of the outer closure member with the indexing disk therein.

FIG. **20** is a top perspective view of the inner closure member with the indexing disk and locking disk thereon.

DESCRIPTION

Referring to FIGS. **1** and **2**, in accordance with the invention, the child resistant reminder closure **30** comprises an outer closure member **31** and an inner closure member **32** retained against limited axially outer movement by an annular bead **33**. The closure **30** is adapted to be used with a container **34** having threads adapted to be engaged with the threads of the closure **30** as presently described.

As shown in FIGS. **2–3**, and **15** the outer closure member **31** comprises a base wall **35** and a peripheral skirt **36**. An assembly of a day disk **37** and an indexing disk **38** is retained against axial movement but permissible rotatable movement with respect to the outer closure member **31** by an annular fiber **39** which engages an inclined surface **40** on the periphery of the indexing disk **38**. The inner closure member **32** is of conventional child resistant construction as presently described and

includes a base wall **41** and a peripheral skirt **42** having internal threads **43** that are adapted to engage threads **44** on the neck of the container **34**. (FIG. **2**).

Upon clockwise rotation of the outer closure member **31** combined with axial movement of the outer closure member **31** toward the inner closure member **32**, the closure **30** is threaded ohio the container. During this rotation, the outer closure member **31** ratchets past the day disk **37** bringing the succeeding indicia **65** into view through the opening **66**, as preferably described.

The day disk **37** is reversible and indicia **65** can be provided on the opposite side as in FIG. **14**. In such an arrangement, the rotation of the outer closure member **31** with respect to the day disk **37** occurs on application of the closure **30** to the container **34**.

As shown in FIG. **14**, the day disk **37** has an opening **45**. A plurality of equally spaced flexible ratcheting fingers **46** are provided on the outer periphery thereof that radially extend clockwise as viewed in FIG. **14** and a plurality of equally spaced and ratcheting flexible fingers **47** on the inner periphery of the opening **45** therein which extend radially circumferentially in the same direction. Fingers **46** are adapted to move into recesses **48** on lugs **49** extending axially from the indexing disk **38** (FIG. **20**). The flexible fingers **47** are adapted to engage axially extending radial ribs **50** on an annular wall **51** that is integral with and extends from the underside of the base wall **35** of the outer closure member **31** (FIG. **19**).

As shown in FIG. **9**, there are axially extending lugs **55** on the underside of the outer closure member **31**. The lugs **55** are adapted to engage the lugs **49** on the indexing disk **38** when the closure **30** is rotated in either direction after a predetermined angle. Interengaging means comprising lugs **60** on the underside of the indexing disk **38** extend into spaces **62** between lugs **61** on the inner closure member **32** (FIG. **17**). Upon axial movement of the outer closure member **31** relative to the inner closure member **32** and counterclockwise rotation of the outer closure member **31**, engagement is provided between the lugs **60**, **61** for unthreading the closure **30** from the container.

The day disk **37** includes indicia **65** for time, such as the days of the week or as shown in FIG. **14**, for two sets of days of the week. The outer closure member **31** is provided with an opening **66** through which each of the indicia **65** may be viewed. The indicia **65** are either embossed, debossed or printed. Upon clockwise rotation of the outer closure member **30** in a direction to apply the inner closure member **32**, the abutments **50** deflect on depending ring Sl and rotate past the flexible elements **47** on the inner surface of the day disk **37**.

The closure components are preferably made of plastic such as polypropylene or polyethylene and the day disk **37** preferably has a different color from the outer closure member **31**.

The closure **30** is applied to the container **34** by rotating the closure onto the threads of the container in at clockwise direction. Continued rotation, in a clockwise direction as viewed from above tightens the threads. Rotation of the outer closure member **31** in a counterclockwise direction will normally merely cause the outer closure member to rotate relative to the inner closure member **32**. In order to remove the closure **30** from the container, it is necessary to move the outer closure member **31** axially toward the inner closure member **32** bringing the lugs **60** on the indexing disk **38** and into the spaces **62** between the lugs **61** on the inner closure member **32** recesses whereby upon continued downward force and counterclockwise rotation of the outer closure member **31** the inner closure member **32** is unthreaded from the container. During this rotation, and before the lugs **55** engage the lugs **49**, the fingers **47** engage the ribs **50** to rotate the day disk **37** with the outer closure member.

Referring to FIG. **2** and **3**, segmented bead **39** on skirt **36** of the ouler closure member **31** is positioned a specific distance from the top panel **35** such that indexing disk **38** and day disk **37** are retained within the upper region or outer closure member **31**. There is sufficient axial distance between the segmented bead **39** and the top panel **35** of the outer closure member **31** that little or no axial dimensional interference exists between the outer closure member **31**, the indexing disk **38** or the day disk **37**. The outer closure member **31**, the indexing disk **38** or the day disk **37** are free to rotate relative to each other but there is very limited axial movement between these parts because of segmented retaining bead **39**. The axial height or thickness of the day disk **37** is less than the axial height of lugs **49** on indexing disk **38** and the lugs **55** on the outer closure member. This arrangement allows the outer closure member **31** and indexing disk **38** to operate in unison with regard to any axial movement of the outer closure **31**. As a result, the axial forces on the outer closure do not interfere with the rotation of the reminder components. Furthermore, the axial forces do not cause wear and obliteration of the indicia.

Closure Removal

To remove closure **30** from container **34**, the outer closure member **31** must be rotated counterclockwise which causes the lugs **55** on the top panel **35** of outer closure member **31** to contact the sides of projections **49** on indexing disk **38** causing it to rotate in a counterclockwise direction. The lugs **60** on indexing disk **38** now contact the lugs **61** on the base wall **41** of inner closure member **32** and will cam up the inclined surface **70** of the succeeding projection **61** unless sufficient axial force is applied to prevent the lugs **60** from camming up this inclined surface. When sufficient downward force is exerted the lugs **60** will impart rotational torque onto the inner closure **32** and cause it to unscrew from the container **34**. The construction of such a child resistant feature is like that of U.S. Pat. No. 4,997,096, incorporated herein by reference. Other well known child resistant constructions may also be used such as shown in U.S. Pat. Nos. 4,353,474, 4,371,088, 4,480,759, 4,609,114, 4,957,210, 5,020,681 and U.K. 1,529,999, incorporated herein by reference, each of which functions with relative axial movement and torque between an outer closure member and an inner closure member.

Closure Application and Tightening

When the closure **30** is applied to the container **34** the outer closure member **31** is rotated in a clockwise direction causing the lugs **55** on its top panel to contact projections **49** on the base wall of the indexing disk **38** causing the indexing disk **[30]** *38* to rotate in a clockwise direction bringing lugs **60** on its bottom panel into contact with sides **71** of lugs **61** on the top panel **41** or inner closure **32** causing it to turn in a clockwise direction. Continued rotation of outer closure member **31** will cause the inner closure **32** to become tightened into container **34**.

During the removal of the closure **30** from the container **34** rotation of the outer closure **31** causes ribs **50** on the ring **51** depending from top panel **35** to contact flexible projections **47** on the day disk **37** causing the day disk to also rotate in the removal direction (counterclockwise). This rotation or the day disk **37** causes the flexible projections **46** to rotate out of indexing pockets **48** in projections **49** on the indexing disk **38**. This rotation of the outer closure **31** and day disk **37** with respect to indexing disk **38** continues until lugs **55** on the base wall **35** of outer closure member **31** come into contact with projections **49** on the indexing disk **38**. The total angular rotation of the outer closure member **31** and day disk **37** with respect to the indexing disk **38** will have advanced the day disk one indexing position with respect to the indexing disk **[37]**" *38* and the day disk **[38]** *37* will have remained stationary with respect to the outer closure **31**. Therefore, the indicia on the day disk **37** viewed through window **66** on the outer closure **31** did not change during this counterclockwise rotation of the outer closure member **31**.

When the closure **30** is applied to the container and the outer closure **31** is rotated in the clockwise direction, the day disk **37** remains stationary with respect to the indexing disk **38** because the flexible projections **46** are locked into the pockets **48** on projections **49** on the indexing disk, while ribs **50** on ring **51** on the outer closure **32** rotate past flexible projections **47** on the interior of day disk **37**. This rotation continues until lugs **55** on the top panel of the outer **31** contact projections **49** on the indexing disk. This entire rotation will have advanced the day disk **31** one indexing position with respect to the outer closure and indicia **[**on**]** *in* the window **66** of the outer **31** will have been advanced one position.

During application and removal of the closure **30** from the container **34** the angular motion of the lugs on the outer closure moves through a predetermined angle as they contact the projections **49** on the indexing disk **38**. For example, if there are **14** indexing positions, then are divides 360° by **14**, or 25.7. Therefore, the indicia should appear on the day disk **37** at 25.7° intervals and the outer should rotate minimum of 25.7° each time a change in rotational direction takes place, for the closure **30** is to advance one indexing position each time the closure **30** is rotated in the clockwise direction as is being applied to the container **34**.

It can thus be seen that there has been provided a child resistant closure which is reliable; which functions to repeatedly provide the desired information; which do not incorporate axial forces between the reminder components; wherein the components are reversible so that the change in visible indicia can be made either as application or removal of the closure; which utilizes old and well known child resistant construction; and which can be manufactured readily in high-production.

I claim:

1. A child resistant reminder closure comprising an outer closure member having a base wall and a peripheral skirt,

an inner closure member having a base wall and a peripheral skirt,

interengaging means between the outer closure member and inner closure member to retain the inner closure member against axially outward movement relative to the outer closure member,

said outer closure member and said inner closure member having limited axial movement **[**to one another**]** *relative to each other,*

an assembly of a day disk and an indexing disk being rotatably mounted on said outer closure member,

said day disk being provided adjacent the inner surface of the base wall of the outer closure member,

said indexing disk being provided adjacent said day disk,

said day disk having an opening and a first set of flexible radial ratcheting means extending radially inwardly into the opening from said day disk and a second set of flexible radial ratcheting means extending radially from the day disk in the same *circumferential* direction as the first set,

said outer closure member having a *first* set of lugs adapted to engage said first set of flexible *radial* ratcheting means *such that there is permissible rotational movement of the day disk relative to the outer closure in one circumferential direction,*

[said outer closure member having another set of lugs adapted to engage said second set of flexible ratcheting means,**]**

said indexing disk having **[**means thereon**]** *a second set of lugs on the top surface* engageable by said **[**first**]** *second* set of *flexible* ratcheting means on said day disk *such that there is permissible rotational movement of the day disk relative to the indexing disk in the opposite circumferential direction from that of permissible rotational movement of the day disk relative to the outer closure member,*

a **[**first**]** set of **[**axially**]** *rotationally* interengageable means between said outer closure member and said indexing disk *which are engaged when the outer closure member is rotated through a predetermined angle in either direction,*

a **[**second**]** set of axially interengageable *child resistant* means between said indexing disk and said inner closure member,

said day disk having circumferentially spaced indicia thereon,

said base wall of said outer closure member having an opening adapted to be selectively aligned with said indicia,

interengaging means on the inner closure member adapted to engage means on a container by relative rotation of said inner closure member and a container,

such that when the outer closure member is moved axially **[**to engage**]** *toward* the inner closure member **[**,**]** *and the outer closure member is rotated, the axially interengageable child resistant means between said indexing disk and said inner closure member become engaged and* the closure can be removed *or applied* from **[**a**]** *the* container *by rotation of the outer closure member* and *such that* said day disk can be rotated relative to said outer closure member during either said application or said removal of said disk to bring different indicia into view through said opening.

2. The child resistant reminder closure set forth in claim **1** wherein said first set of flexible radial ratcheting means on said day disk comprise flexible fingers extending circumferentially in one direction and having free ends, said second of said set of flexible radial ratcheting means comprising a plurality of circumferentially extending flexible fingers extending circumferentially in the same direction as the first set of fingers **[**and**]** , *said*

first set being positioned on [and] *the* opening in said day disk.

3. The child resistant reminder closure set forth in claim 2 wherein [one] said *set of rotationally interengageable means between said outer closure member and said indexing disk comprises a third* set of [said] lugs on said outer closure member [is] positioned at the juncture of the base wall and peripheral skirt of said outer closure member [the other set of lugs is] said set of lugs is, *said first set of lugs on said closure member engaging said first set of flexible fingers being* positioned on the periphery of a cylindrical surface extending downwardly from the base wall of said outer closure member.

4. The child resistant reminder closure set forth in claim 3 wherein said means on said indexing disk engageable with the [first] *second* set of flexible fingers on said day disk comprise lugs on said indexing disk extending toward said base wall of said outer closure and having, recesses therein engaging the free ends of the [first] *second* set of flexible fingers comprising the first set of ratcheting means. [, said one set of lugs on said outer closure member being adapted to engage said lugs on said indexing ring when the outer closure member is rotated in either direction.]

5. The child resistant reminder closure set forth in claim 4 wherein said [second] set of axially interengageable *child resistant* means between said indexing disk and said inner closure member comprises a fourth set of lugs on the underside of said indexing disk and a *and a fifth set of* circumferentially *spaced* lugs on the top surface of said base wall of said inner closure member,

said *fourth set of* lugs on the underside of the indexing disk being adapted to extend between the recesses of said *fifth set of* lugs on the inner closure member when the outer closure member is moved axially toward the inner closure member and to engage the fourth set of lugs on the inner closure member when the outer closure member is rotated to apply or remove the closure from a container.

6. The child resistant reminder closure set forth is any one of claims 1–5 wherein said flexible ratcheting means on said day disk extend circumferentially such that said day disk is rotated relative to said outer closure member on removal of the closure.

7. The child resistant reminder closure set forth in any one of claims 1–5 wherein said flexible ratcheting means on said day disk extend circumferentially such that said day disk is rotated relative to said outer closure member on application of the closure.

8. The child resistant reminder closure set forth in any one of claims 4–7 wherein the thickness of the day disk in an axial direction is less than the axial height of [the] *said second set of* lugs on the indexing disk which extends toward the outer closure member and less than the axial height of [the] *said third set of* lugs [on] *located at the juncture of the base wall and skirt of* the outer closure member.

9. The child resistant reminder closure set forth in claim 1 comprising means on said outer closure member for holding said assembly of said day disk and indexing disk against axially outward movement relative to said outer closure member.

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