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Imanari et al.

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(54) **BAYONET MOUNT**

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(30) **Foreign Application Priority Data**

Dec. 16, 1999 (JP) 11-357374

(51) **Int. Cl.**[7] **G03B 17/14**
(52) **U.S. Cl.** **396/531**; 359/828

(58) **Field of Search** 396/529, 530, 396/531, 532; 359/828

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Primary Examiner—Alan A. Mathews

(57) **ABSTRACT**

A bayonet mount includes a mount main body constituted of resin and a metal member that, at least partially, reinforces a bayonet tab portion at the mount main body.

6 Claims, 10 Drawing Sheets

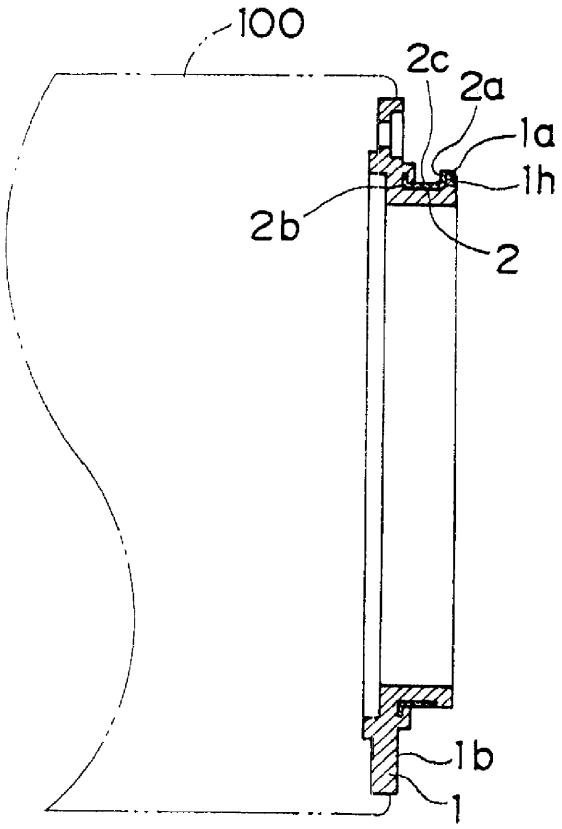
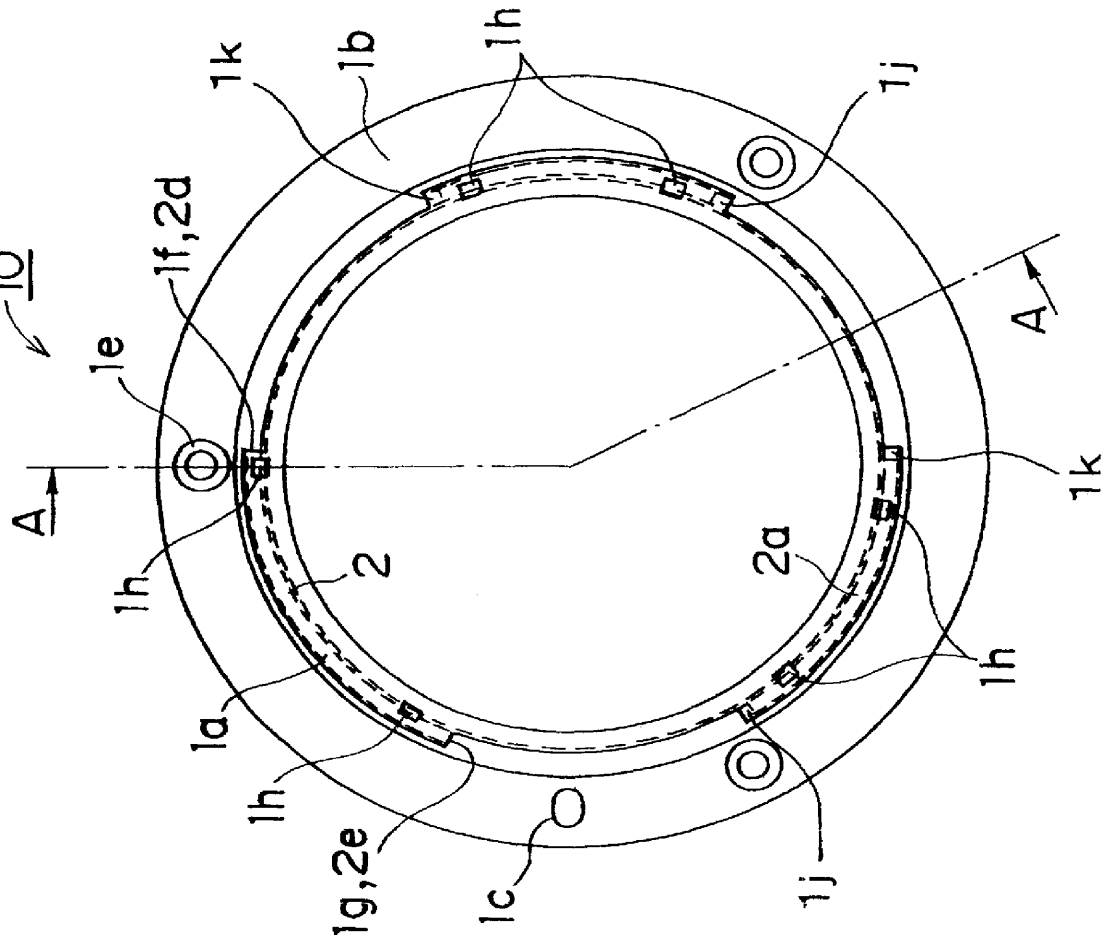


FIG.1B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1k
1b
1h
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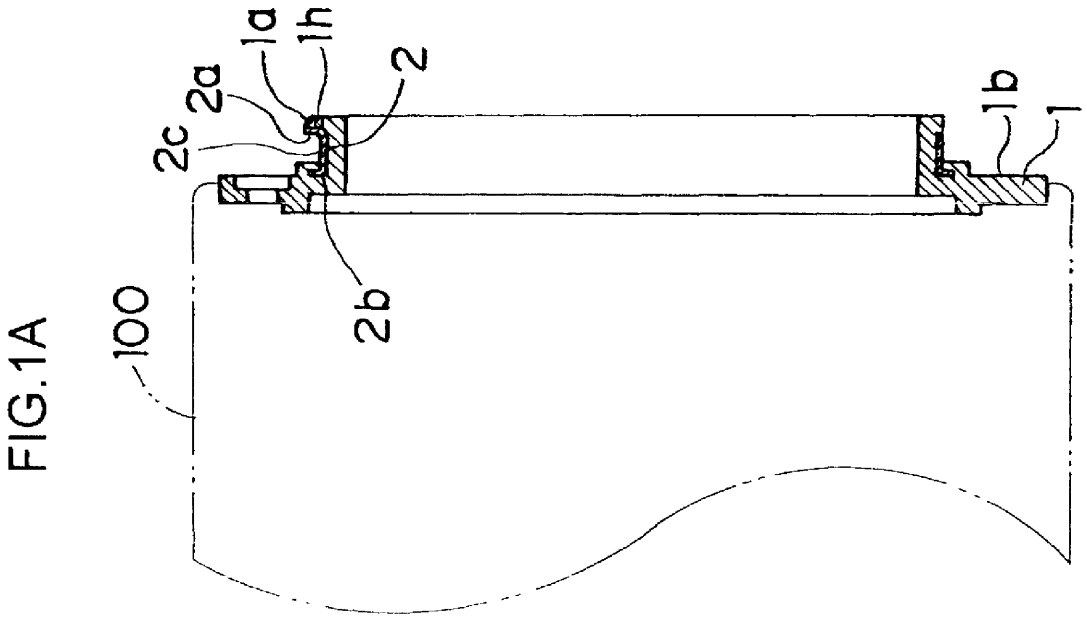
1a
1h
1g,2e
1c
1j

FIG.1A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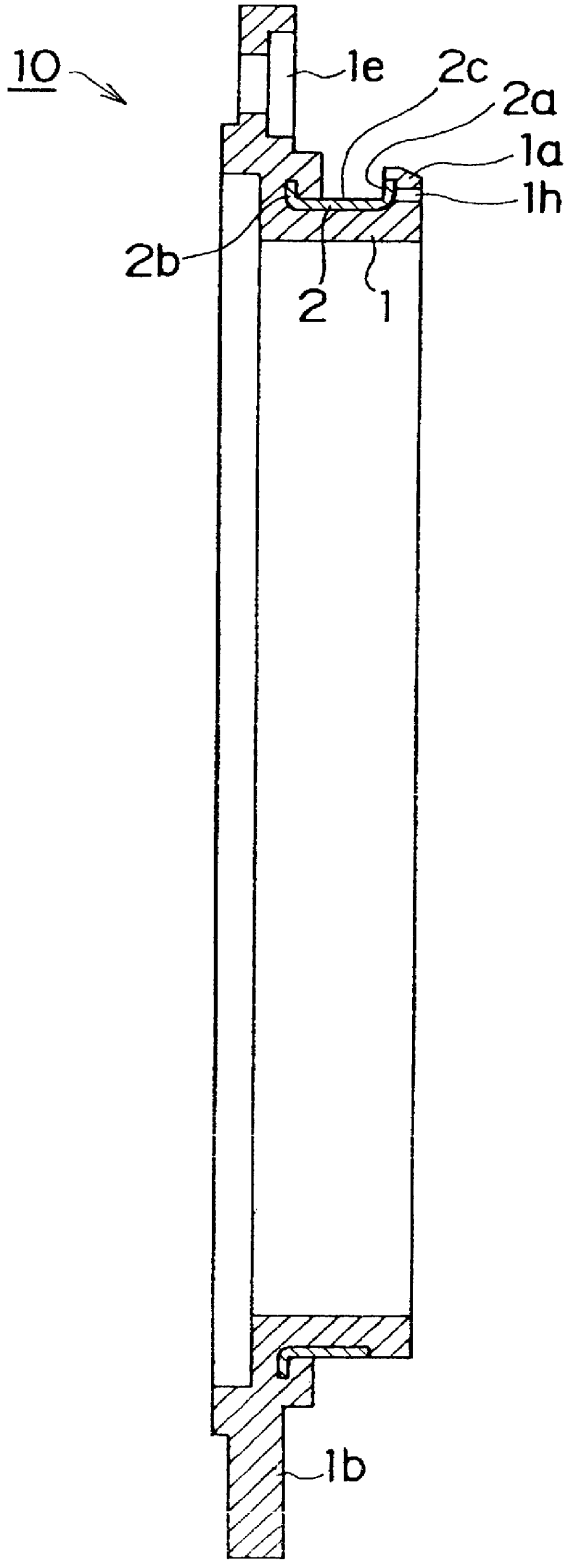
1a
1h
2
1b
1
2b

FIG.2



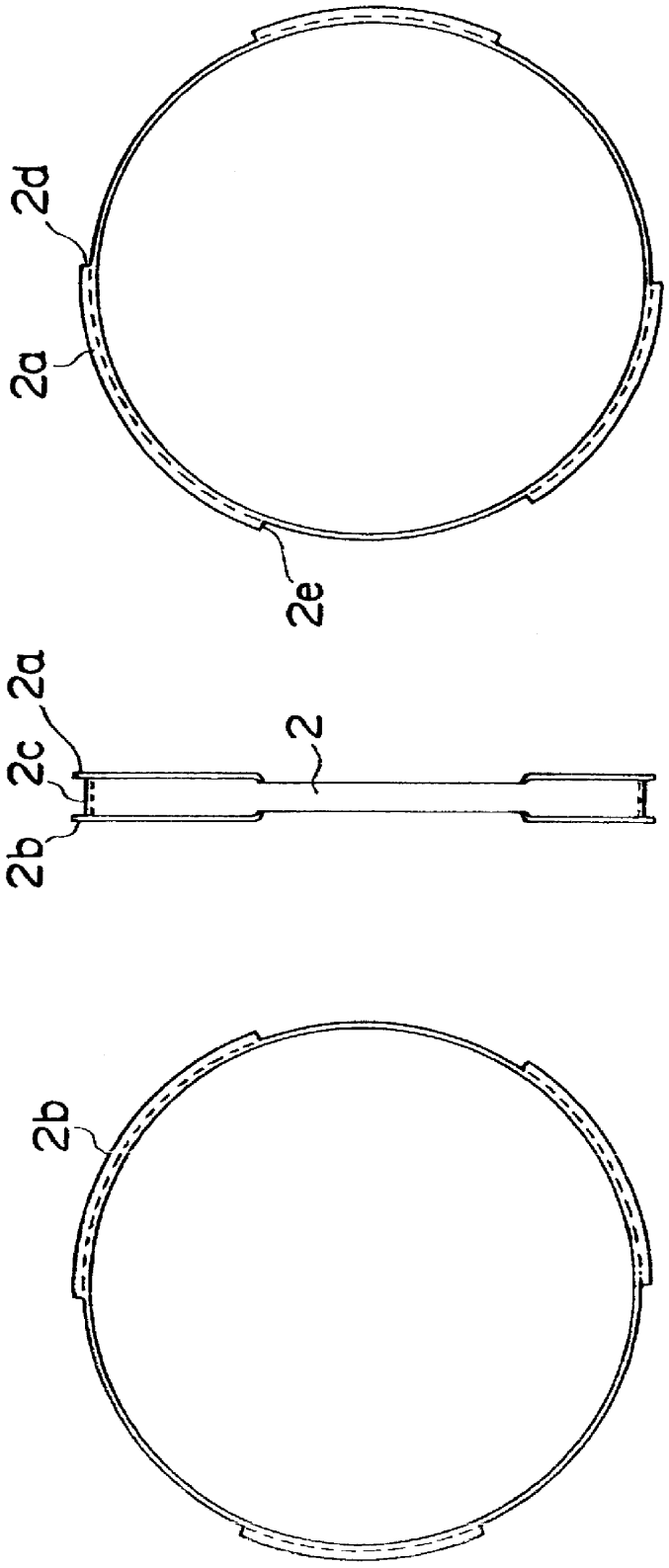


FIG.3C

FIG.3B

FIG.3A

FIG.4C

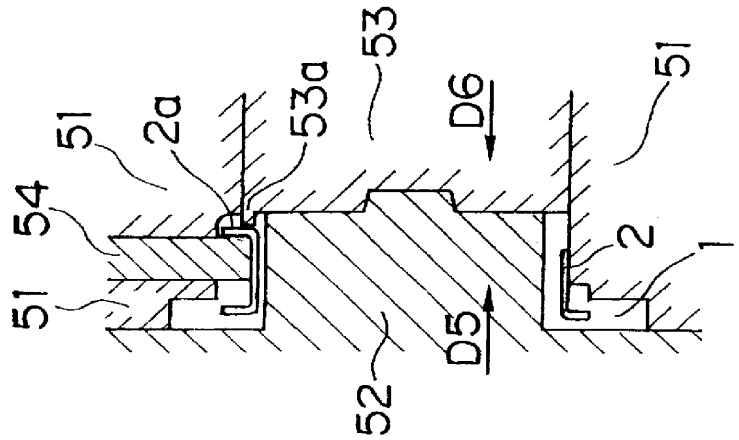


FIG.4B

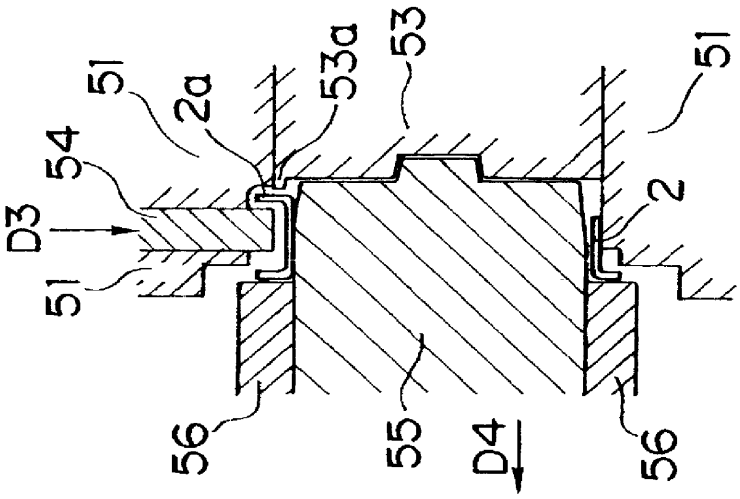


FIG.4A

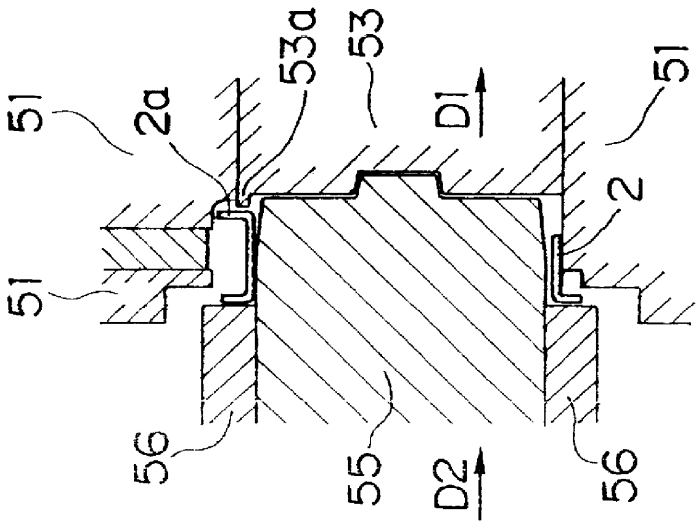


FIG.5

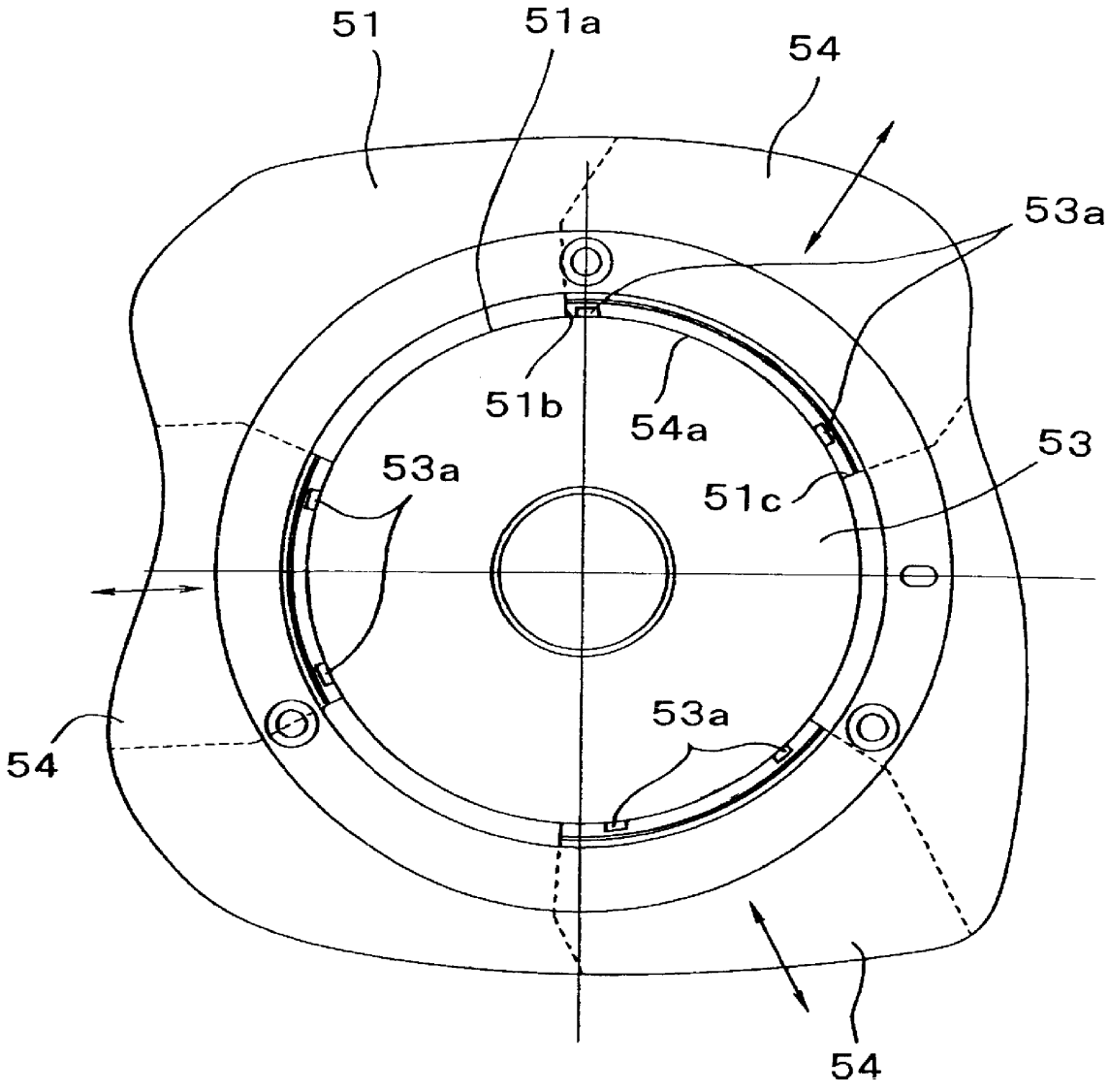


FIG.6

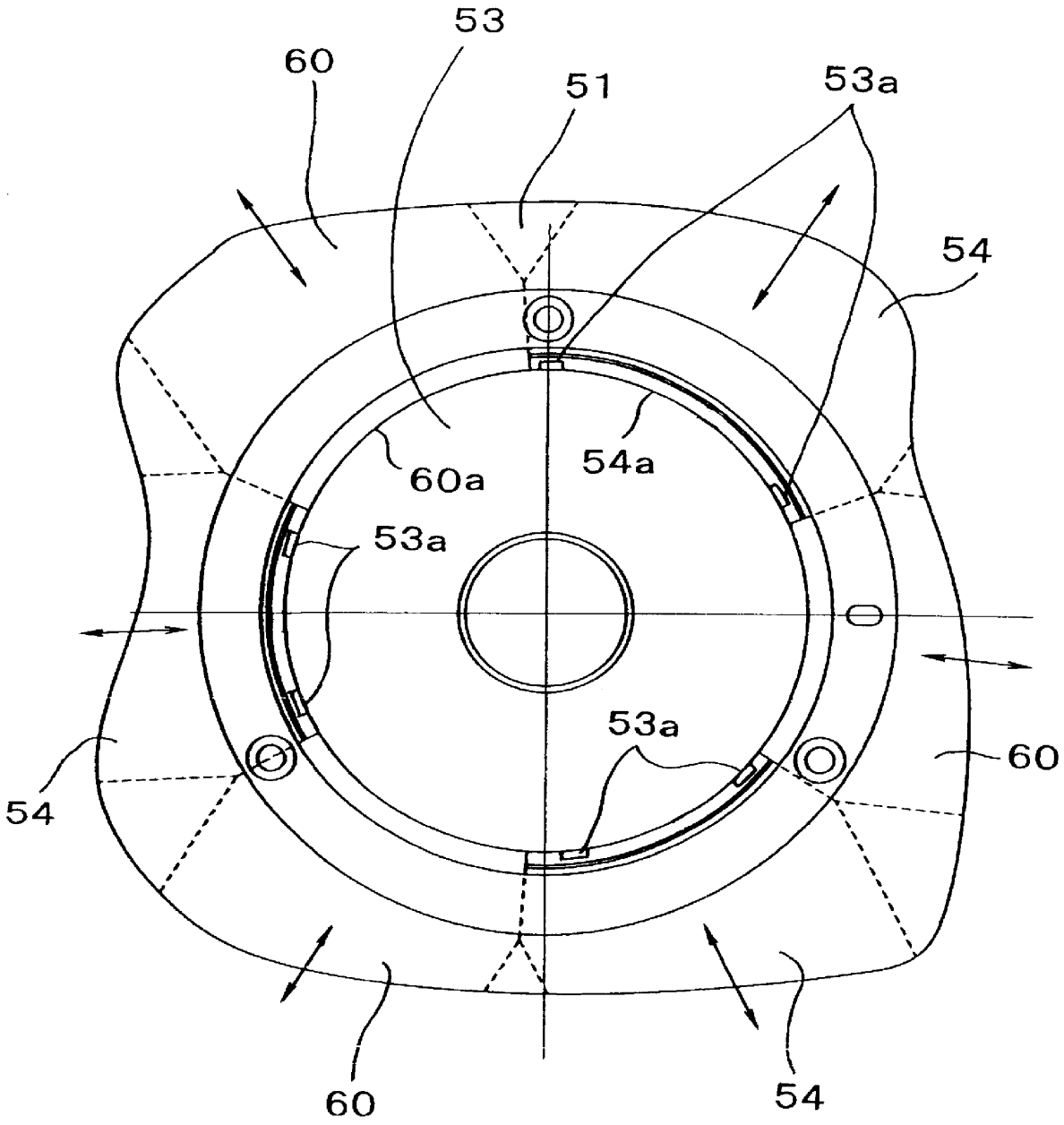


FIG.7B

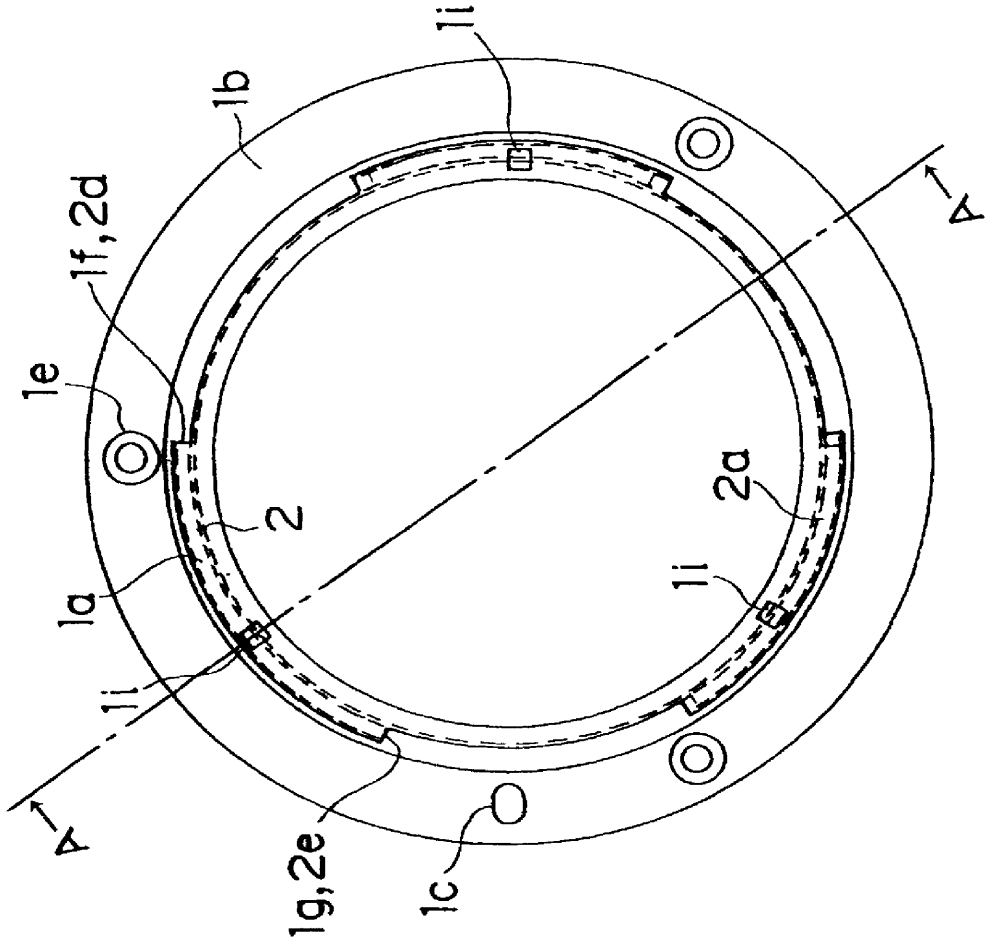


FIG.7A

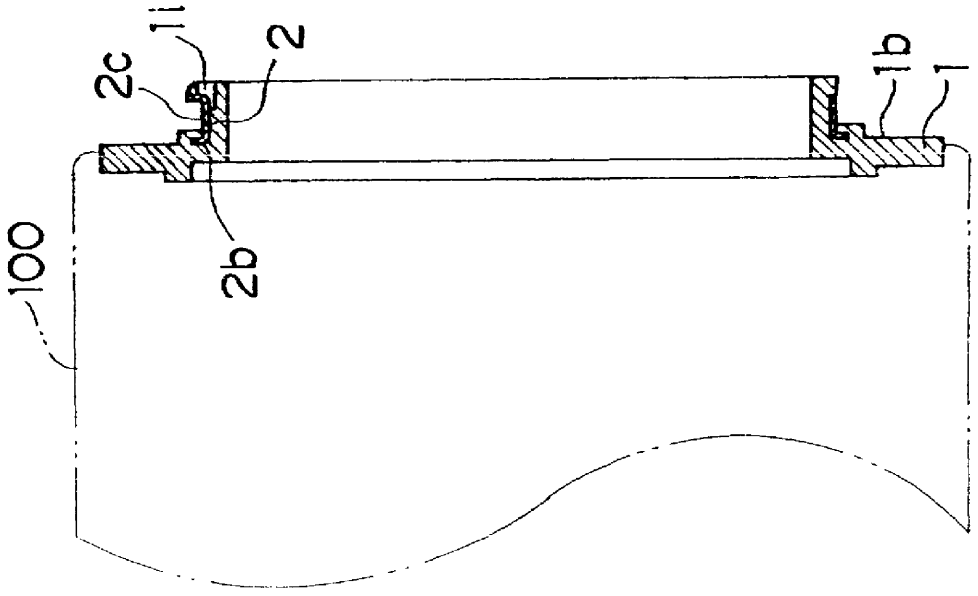


FIG.8

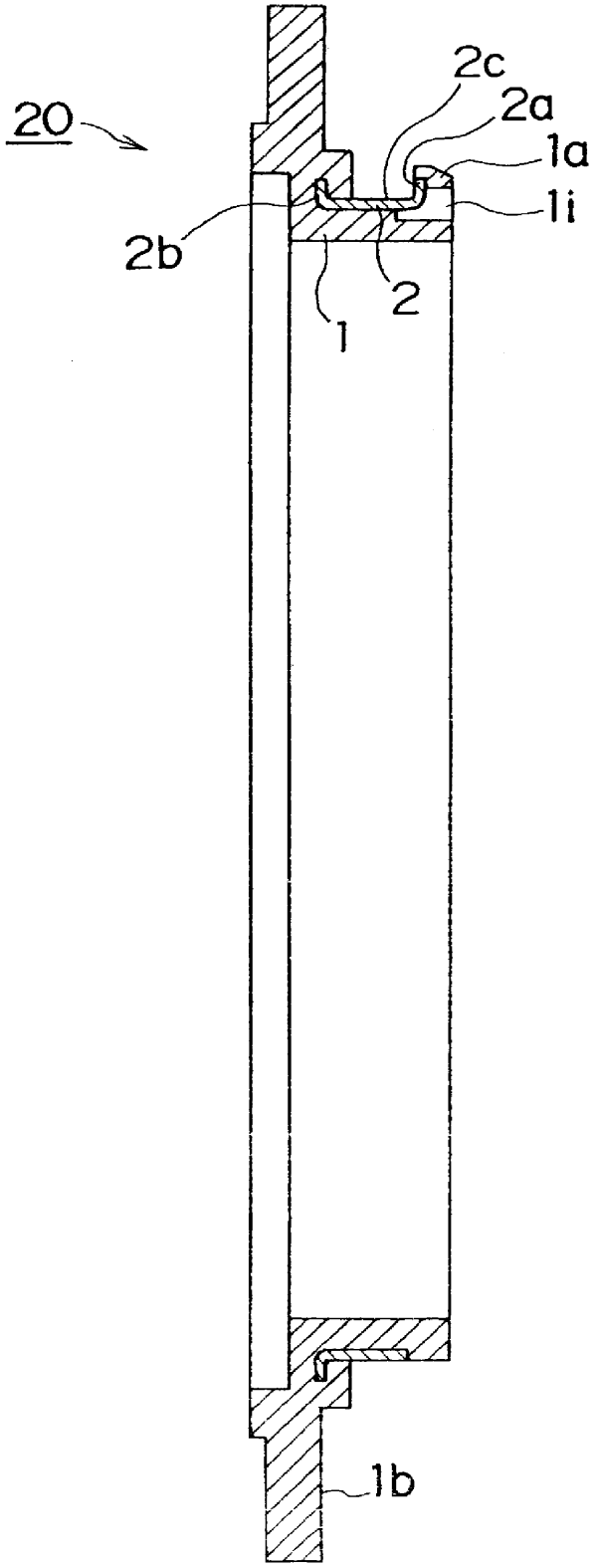
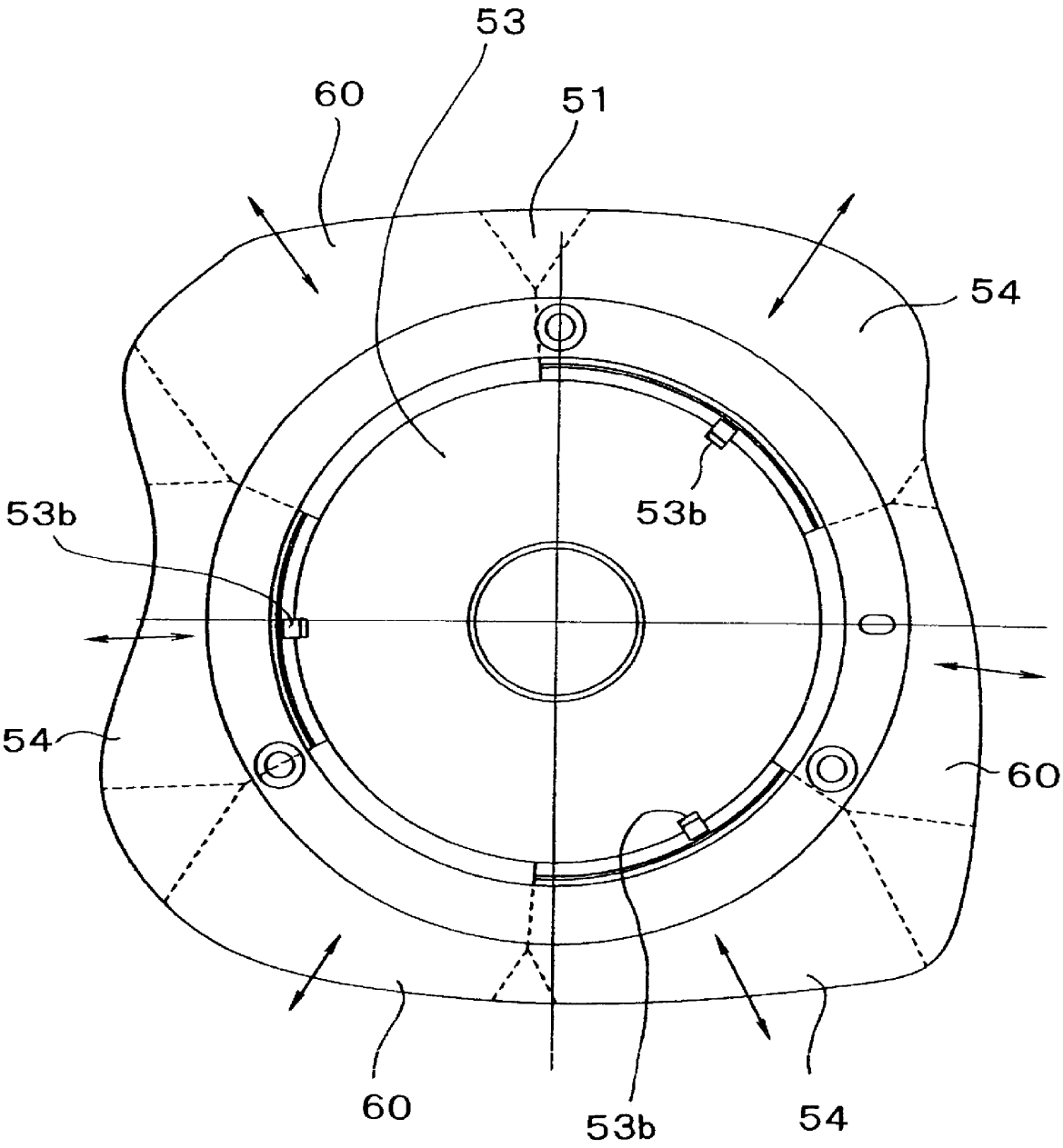


FIG.9



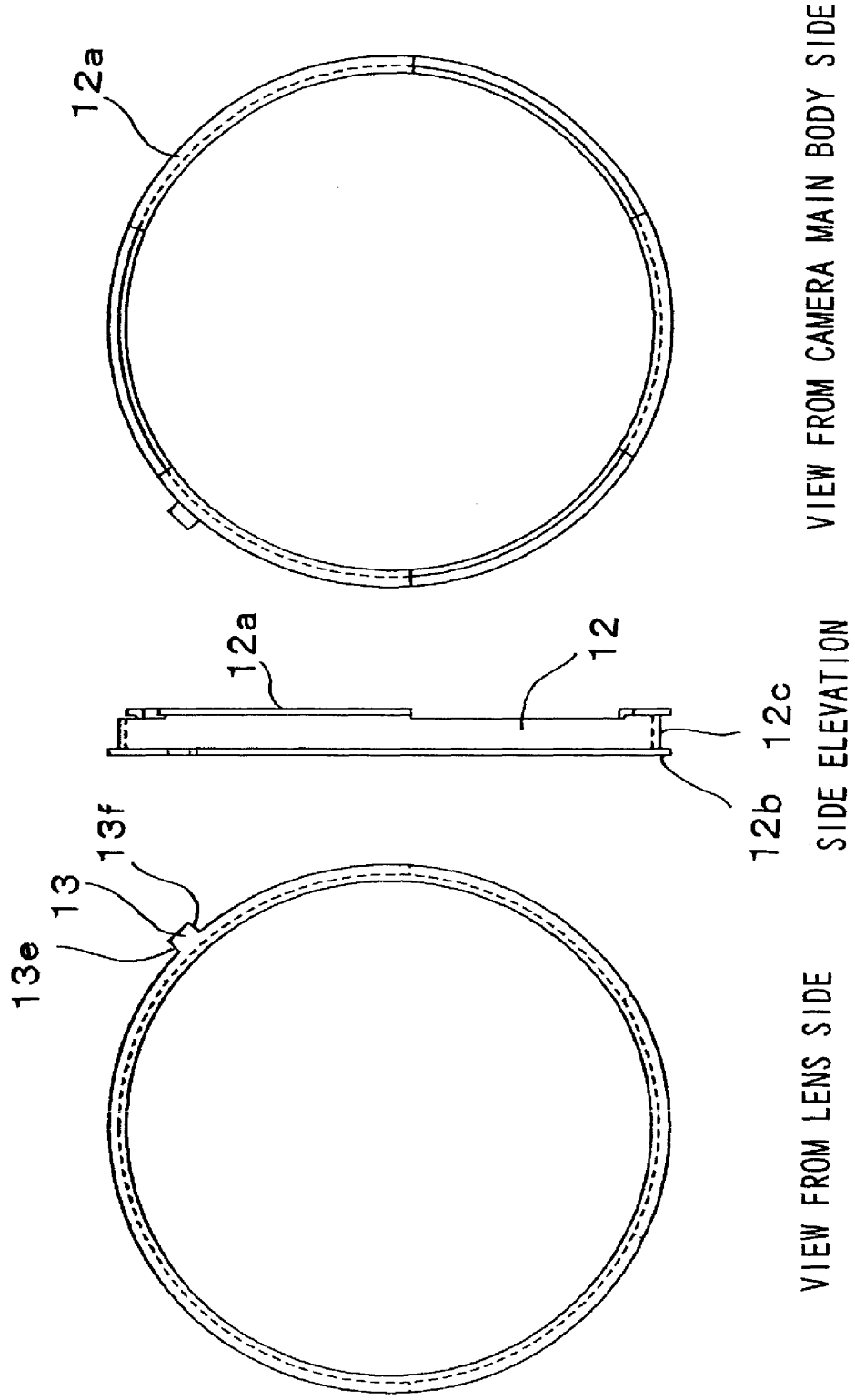


FIG.10C

FIG.10B

FIG.10A

BAYONET MOUNT

This application is a continuation of International Application No. PCT/JP00/08924 filed Dec. 15, 2000.

INCORPORATION BY REFERENCE

The disclosures of following applications are herein incorporated by reference: Japanese Patent Application No. H11-357374 filed Dec. 16, 1999; and International Application No. PCT/JP00/08924 filed Dec. 15, 2000.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a bayonet mount used to fasten a photographic lens, an adapter or the like of a camera such as a single lens reflex camera, an electronic camera, a video camera or the like, which uses interchangeable lenses, to a body.

2. Description of the Related Art

A bayonet mount in the prior art used in a single lens reflex camera or the like is provided with a plurality of tabs projecting out radially from a cylindrical surface both on the side toward the lens and on the side toward the body. By rotating them relative to each other after they are fitted together, the tabs are interlocked, thus fastening the lens to the body.

While a majority of bayonet mounts in the prior art are constituted of metal, the progress achieved in the field of engineering plastics in recent years has enabled production of bayonet mounts through injection molding of a plastic resin.

However, while the metal bayonet mounts in the prior art achieve a high degree of strength, they present a problem in that since the tabs must be formed through a milling process or the like, the production costs are high. While the production costs of plastic bayonet mounts in the prior art, on the other hand, can be kept low, there is a problem in that a plastic bayonet mount failing to achieve a sufficient degree of strength cannot be used in conjunction with lenses or the like with a large dead load since the tabs cannot withstand the load attributable to the weight of the lens and the body.

There is another problem in that as the plastic bayonet mount in the prior art is mounted and dismounted repeatedly, its durability is reduced.

In order to address the problem of insufficient strength of the plastic bayonet mount, the mount disclosed in Japanese Laid-Open Patent Publication No. H 3-229230 (U.S. Pat. No. 5,262,899) achieves a higher degree of rigidity by forming a cylindrical portion extending along the optical axis of the mount as an integrated part. However, while this mount may be adopted in practical application as long as new mount standards are set, it cannot be utilized in conformance to the current standards, since it does not have compatibility with existing products.

In addition, Japanese Laid-Open Patent Publication No. H3-231726 discloses a mount having the area surrounding a mount lock groove constituted of a metal member to compensate for the insufficient strength of the mount lock groove. However, this mount merely addresses the insufficient strength of the mount lock groove, and does not provide a solution to the insufficient strength of the bayonet mount tabs.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a bayonet mount achieving a sufficient degree of strength that can be produced at low cost and a manufacturing method adopted to manufacture the bayonet mount.

In order to attain the above object, a bayonet mount according to the present invention, comprises: a mount main body constituted of resin; and a metal member that, at least partially, reinforces a bayonet tab portion at the mount main body.

In this bayonet mount, it is preferred that: a plurality of bayonet tab portions are provided along a direction of a circumference of the bayonet main body; and the metal member includes a plurality of tab reinforcements for reinforcing the plurality of bayonet tab portions, the plurality of tab reinforcements being formed as an integrated part. In this case, it is preferred that: the metal member includes a plurality of slip-stop portions facing opposite the plurality of tab reinforcements; and the plurality of tab reinforcements and the plurality of slip-stop portions are formed as an integrated unit. Or, it is preferred that: the metal member includes a slip-stop portion facing opposite the plurality of tab reinforcements; and the slip-stop portion is formed continuously along the direction of the circumference of the mount main body.

Also, in any one of above bayonet mounts, it is preferred that: the metal member includes a cylindrical reinforcement formed along a cylindrical shape of the bayonet mount; the plurality of tab reinforcements project out along a radial direction from a central axis of the cylinder at an end surface of the cylindrical reinforcement; and the cylindrical reinforcement and the plurality of tab reinforcements are formed as an integrated unit.

A method according to the present invention for manufacturing a bayonet mount by insert-molding a metal member having a cylindrical reinforcement formed along a cylindrical shape of the bayonet mount and at least one tab reinforcement projecting out along a radial direction from a central axis of the cylindrical shape at an end surface of the cylindrical reinforcement, the cylindrical reinforcement and the tab reinforcement being formed as an integrated unit, comprises: a step in which a position of the metal member relative to a die is regulated by using the cylindrical reinforcement and the tab reinforcement of the metal member; and a step in which a resin is injected after the position of the metal member relative to the die is regulated.

Another method according to the present invention for manufacturing a bayonet mount by insert-molding a metal member having a cylindrical reinforcement formed along a cylindrical shape of the bayonet mount and at least one tab reinforcement projecting out along a radial direction from a central axis of the cylindrical shape at an end surface of the cylindrical reinforcement, the cylindrical reinforcement and the tab reinforcement being formed as an integrated unit, comprises: a radial-direction regulating step in which a position of the metal member relative to a die along a radial direction of the cylindrical shape is regulated by using the cylindrical reinforcement of the metal member; a rotational-direction regulating step in which the position of the metal member relative to the die along a rotational direction around a central axis of the cylindrical shape is regulated by using the tab reinforcement of the metal member; an axial-direction regulating step in which the position of the metal member relative to the die along a direction of the central axis of the cylindrical shape is regulated by using the tab reinforcement of the metal member; and an injecting step in which a resin is injected after the position of the metal member relative to the die is regulated along the radial direction, the rotational direction and the direction of the central axis.

In this method for manufacturing a bayonet mount, it is preferred that the radial-direction regulating step and the axial-direction regulating step are implemented concurrently by using a single member provided at the die.

Also, it is preferred that a bayonet mount according to the present invention is manufactured through the above method for manufacturing a bayonet mount.

Thus, a bayonet mount achieving a high degree of strength at the bayonet tabs can be manufactured with ease at low production cost, as described above. Furthermore, the position of the metal member relative to the mount main body can be set with more ease and with a higher degree of accuracy.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is a sectional view of a first embodiment of the bayonet mount **10** according to the present invention;

FIG. **1**B is a front view of the first embodiment of the bayonet mount **10** according to the present invention;

FIG. **2** is an enlargement of FIG. **1**A;

FIG. **3**A shows the reinforcement ring **2** in the first embodiment, viewed from the lens side;

FIG. **3**B is a side elevation of the reinforcement ring **2** in the first embodiment;

FIG. **3**C shows the reinforcement ring **2** in the first embodiment viewed from the camera main body side;

FIGS. **4**A~**4**C illustrate the process through which the position of the reinforcement ring **2** is regulated during the insert-molding process;

FIG. **5** shows the die utilized to achieve the first embodiment, viewed along the direction indicated by the arrow D1 in FIG. **4**A;

FIG. **6** shows the die utilized to achieve a third embodiment, viewed along the direction indicated by the arrow D1 in FIG. **4**A;

FIG. **7**A is a sectional view of a fourth embodiment of the bayonet mount **20** according to the present invention;

FIG. **7**B is a front view of the fourth embodiment of the bayonet mount **20** according to the present invention;

FIG. **8** is an enlargement of FIG. **7**A;

FIG. **9** shows the die used to achieve the fourth embodiment, viewed along the direction indicated by the arrow D1 in FIG. **4**A;

FIG. **10**A shows the reinforcement ring **2** used in a fifth embodiment, viewed from the lens side;

FIG. **10**B is a side elevation of the reinforcement ring **2** in the fifth embodiment; and

FIG. **10**C shows the reinforcement ring **2** in the fifth embodiment viewed from the camera main body side.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First Embodiment)

FIG. **1** presents a sectional view and a front view of the first embodiment of the bayonet mount **10** according to the present invention. FIG. **1**B is a front view of the bayonet mount **10** taken from the side where the camera main body (not shown) is present, whereas FIG. **1**A is a sectional view taken along A–A in FIG. **1**B. FIG. **2** is an enlargement of FIG. **1**A.

The bayonet mount **10**, which is provided at an interchangeable lens **100** used in a camera which allows lens exchange, is utilized to mount the interchangeable lens **100** at the camera main body. While a bayonet mount provided at the interchangeable lens **100** is normally referred to as a male bayonet mount and a bayonet mount provided at the camera main body is referred to as a female bayonet mount, a male bayonet mount is simply referred to as a bayonet mount in the following explanation of the embodiment.

The bayonet mount **10** includes a mount main body **1** and a reinforcement ring **2**. The material used to form the mount main body **1**, which constitutes the main body formed by embedding the reinforcement ring **2** as an integrated part through insert-molding during the molding process, is polycarbonate. The mount main body **1** includes tab portions **1***a*, a reference surface **1***b*, a lock groove **1***c* at which a lock pin (not shown) is inserted for locking when the mount is mounted at the camera main body, spot-facing holes **1***e* at which a lens barrel **100** and the bayonet mount **10** are secured to each other with screws (not shown) and the like.

In addition, the mount main body **1** includes tab ends **1***f* and **1***g* (see FIG. **1**B) provided at the two ends of a tab portion **1***a*, with tab ends **2***d* and **2***e* of the reinforcement ring **2** exposed at the tab ends **1***f* and **1***g* respectively. The tab ends **2***d* and **2***e* are exposed since the tab ends **2***d* and **2***e* of the reinforcement ring **2** come into contact with a fixed die **51** when the reinforcement ring **2** is positioned along the rotational direction and the molding process is implemented while sustaining this state (to be detailed later).

The mount main body **1** further includes six holes **1***h* on camera main body side, which reach the reinforcement ring **2**. The holes **1***h* are left by projecting portions **53***a* of a fixed-side center core **53** to be detailed later, which are used to hold the reinforcement ring **2** during the molding process.

FIGS. **3**A~**3**C show the reinforcement ring **2**. FIG. **3**A shows the reinforcement ring **2** viewed from the lens side, FIG. **3**B presents a side elevation and FIG. **3**C shows the reinforcement ring **2** viewed from the camera main body side. The reinforcement ring **2** includes three tab reinforcements **2***a* provided on the camera main body side, three slip-stop portions **2***b* provided on the lens side and a cylindrical portion **2***c* extending along the cylindrical form of the bayonet mount itself. The tab reinforcements **2***a* and the slip-stop portions **2***b* project out (extend) from the end surfaces of the cylindrical portion **2***c* in a radial direction originating from the central axis (corresponds to the optical axis of the lens) of the cylinder. The reinforcement ring **2**, formed by machining stainless steel through press-machining such as drawing, is constituted of an integrated unit which includes the tab reinforcements **2***a*, the slip-stop portions **2***b* and the cylindrical portion **2***c*.

The reinforcement ring **2** is mounted at a die (or mold) when forming the mount main body **1**, and is integrated into the mount main body **1** through insert-molding.

(Regulating Position of Reinforcement Ring **2** at Die)

The accuracy of the positional relationship between the mount main body **1** and the reinforcement ring **2** is ensured by accurately regulating the position of the reinforcement ring **2** in the die when mounting the reinforcement ring **2** at the die. FIG. **4** illustrates the process implemented to regulate the position of the reinforcement ring **2** during the insert-molding process, which is started it in the step shown in FIG. **4**A and is completed in FIG. **4**C.

The die used in the embodiment includes the fixed die **51**, a movable die **52**, the fixed-side center core **53** and a sliding dies **54**, and a mounting tool **55** and a sleeve **56** are also utilized in addition to the individual dies when setting the reinforcement ring **2** at the die.

The following is an explanation of the die operation during the insert-molding process, given by focusing on the method adopted to mount the reinforcement ring **2**.

(1) The fixed-side centercore **53** is made to retreat by 0.3 mm along the direction indicated by the arrow D1 while the die is open.

(2) The reinforcement ring **2** is inserted at the mounting tool **55** which is provided with the sleeve **56**. The reinforcement ring **2** is inserted at this time by roughly setting its position relative to the mounting tool **55** along the rotational direction with the tab end surfaces **2***e* and **2***d* of one of the tab reinforcements **2***a*. In the embodiment, the upper left tab reinforcement **2***a* in FIG. **3**C is used for this purpose. Then, the reinforcement ring **2** is inserted further inward by 0.3 mm from the home position together with the mounting tool **55** along the direction indicated by the arrow D2. By fitting the tab end surfaces **2***e* and **2***d* at tab-shaped portions formed at the fixed die **51** so as to place the tab end surfaces **2***e* and **2***d* in contact with the fixed die **51**, the position of the reinforcement ring **2** relative to the die along the rotational direction is regulated (FIG. **4**A). It is to be noted that the side of the fixed die **51** at which the reinforcement ring **2** is inserted is beveled to allow the reinforcement ring **2** to be inserted smoothly.

(3) The sliding dies **54** are advanced forward along the direction indicated by the arrow D3 by using an air cylinder. The sliding dies **54** regulate the position along the radial direction by holding the cylindrical portion **2***c* of the reinforcement ring **2** from the external circumference (see FIG. **4**B).

(4) By using the sleeve **56**, the reinforcement ring **2** is disengaged from the mounting tool **55** and the mounting tool **55** and the sleeve **56** are taken out of the die while leaving the reinforcement ring **2** inside the die.

(5) The die is closed by moving the movable die **52** along the direction indicated by the arrow D5, and the fixed-side center core **53** is moved by 0.3 mm along the direction indicated by the arrow D6. As a result, the position of the reinforcement ring **2** along the direction in which the optical axis extends is regulated with the projecting portion **53***a* of the fixed-side center core **53** holding the tab reinforcements **2***a* of the reinforcement ring **2**. Since its position is already fixed along the radial direction and the rotational direction, the reinforcement ring **2** thus becomes secured at the specific position relative to the die (see FIG. **4**C).

(6) The die is then filled with resin in the state described above to mold the mount main body **1** and the reinforcement ring **2** as an integrated unit, thereby completing the process of manufacturing the bayonet mount **10**.

FIG. **5** shows the die viewed along the direction indicated by an the arrow D1 in FIG. **4**A. The sliding dies **54** each slide in the direction indicated by the arrow. As explained above, the reinforcement ring **2** is fitted so as to place the tab end surfaces **2***d* and **2***e* (see FIG. **3**C) of one of the tab reinforcements **2***a* in contact with the end surfaces of **51***b* and **51***c* of the fixed die **51**. This structure specifically does not require the other two tab reinforcements to be in contact with the fixed die **51**. Namely, the position of the reinforcement ring **2** along the rotational direction is regulated by one tab reinforcement **2***a* and the end surfaces **51***b* and **51***c* of the fixed die **51**. As a result, while the tab ends **2***d* and **2***e* of the reinforcement ring **2** are exposed at the tab ends **1***f* and **1***d* at the two ends of one of the tab portions **1***a*, the tab end surfaces of the tab reinforcements **2***a* are covered with mold members **1***j* and **1***k* at the ends of the other two tab portions, as illustrated in FIG. **1**B.

The six projecting portions **53***a* are set as shown in FIG. **5** at the fixed-side center core **53**. It is to be noted that FIG. **5** shows the projecting portions **53***a* to facilitate the explanation although the projecting portions **53***a* provided at the fixed-side center core **53** are actually hidden by the sliding dies **54** when the sliding dies **54** are lowered to hold the reinforcement ring **2**. In addition, the fixed dies **51** and the sliding dies **54** include arched end surfaces **51***a* and **54***a* respectively. Thus, the entire surface of the cylindrical portion **2***c* of the reinforcement ring **2** is covered by the end surfaces **51***a* of the fixed dies **51** and the end surfaces **54***a* of the sliding dies **54** to prevent the molding material from adhering to the surface of the cylindrical portion.

As described above, by adopting the first embodiment in which the reinforcement ring **2** is embedded at the mount main body **1** with ease through insert-molding, a bayonet mount achieving a degree of strength equivalent to that achieved by a metal bayonet mount is manufactured at low cost. In addition, the bayonet mount is manufactured with ease through insert-molding which eliminates the necessity for implementing the assembly process for the mount main body and the like.

Furthermore, the position of the reinforcement ring **2** is regulated along the radial direction, the rotational direction and the direction along the optical axis by using tab reinforcements **2***a* and the cylindrical portion **2***c* of the reinforcement ring **2**, the position of the metal member relative to the mount main body can be set with further ease and with a higher degree of accuracy.

(Second Embodiment)

An example in which the position of the reinforcement ring **2** along the rotational direction is regulated by using the tab end surfaces **2***d* and **2***e* of a tab reinforcement **2***a* and the end surfaces **51***b* and **51***c* of a fixed die **51** is explained in reference to the first embodiment. Alternatively, accurate positional regulation may be achieved along the rotational direction when inserting the reinforcement ring **2** at the mounting tool **55**. In the second embodiment, the position of the reinforcement ring **2** along the rotational direction is regulated by utilizing a mounting tool **55** which includes the sleeve **56**. The following explanation of the second embodiment is given in reference to FIG. **4** illustrating the first embodiment since it only differs from the first embodiment in part in the flow of the die operation and also in part in the structures of the mounting tool **55** and the sleeve **56**.

The following is an explanation of the method adopted in the second embodiment for mounting the reinforcement ring **2** and the flow of the die operation during the insert-molding process achieved in the second embodiment.

(1) The fixed-side center core **53** is made to retreat by 0.3 mm along the direction indicated by the arrow D1 while the die is open.

(2) The reinforcement ring **2** is inserted at the mounting tool **55** which is provided with the sleeve **56**. The reinforcement ring **2** is inserted at this time by setting its position relative to the mounting tool **55** along the rotational direction with the end surfaces (end surfaces corresponding to the tab end surfaces **2***e* and **2***d* of a tab reinforcement **2***a*) of one of the slip-stop portions **2***b*. While the position of the reinforcement ring **2** along the rotational direction is roughly set at this time in the first embodiment, the position along the rotational direction is accurately set in the second embodiment. This is achieved by providing the sleeve **56** with projections that interlock with the end surfaces of the slip-stop portion **2***b*. The position of the reinforcement ring **2** relative to the die along the rotational direction is thus regulated. The slip-stop portion used during this process is the upper right slip-stop portion **2***b* in FIG. **3**A. It is to be noted that the position of the reinforcement ring **2** along the

rotational direction may be determined by using the tab end surfaces **2***e* and **2***d* of a tab reinforcement **2***a*, instead.

(3) Then, the reinforcement ring **2** is inserted further inward by 0.3 mm together with the mounting tool **55** along the direction indicated by the arrow D2 from the home position (see FIG. **4**A).

(4) The sliding dies **54** are advanced forward along the direction indicated by the arrow D3 by using an air cylinder. The sliding dies **54** regulate the position along the radial direction by holding the cylindrical portion **2***c* of the reinforcement ring **2** from the external circumference (see FIG. **4**B).

(5) By moving the fixed-side center core **53** by 0.3 mm along the direction indicated by the arrow D6, a projected portion **53***a* of the fixed-side center core **53** is made to hold the tab reinforcement **2***a* of the reinforcement ring **2**. The position of the reinforcement ring **2** along the direction of the optical axis is thus regulated. At the same time, the projecting portion **53***a* of the fixed-side center core **53** fixes the position of the tab reinforcement **2***a* by clamping the tab reinforcement **2***a* of the reinforcement ring **2** between the sliding dies **54** and itself.

(6) By using the sleeve **56**, the reinforcement ring **2** is disengaged from the mounting tool **55** and the mounting tool **55** and the sleeve **56** are taken out of the die while leaving the reinforcement ring **2** inside the die. At this time, since the tab reinforcement **2***a* of the reinforcement ring **2** is clamped between the projecting portion **53***a* of the fixed-side center core **53** and the sliding dies **54** and is thus secured, the position of the reinforcement ring **2** along the rotational direction is continuously regulated. In other words, at this point, the position of the reinforcement ring **2** is regulated along the direction in which the optical axis extends, the radial direction and the rotational direction. Thus, it is secured at a specific position relative to the die.

(5) The movable die component **52** is moved along the direction indicated by the arrow D5, thus closing the die (see FIG. **4**C).

(6) The die is then filled with resin in the state described above to mold the main body **1** and the reinforcement ring **2** as an integrated unit, thereby completing the process of manufacturing the bayonet mount **10**.

As described above, by adopting the second embodiment in which accurate positional regulation is achieved along the rotational direction when inserting the reinforcement ring **2** at the mounting tool **55**, the process of inserting the reinforcement ring **2** mounted at the mounting tool **55** into the die is facilitated. In other words, the design of the die can be simplified compared to that required in the first embodiment and, at the same time, the process management for bayonet mount production is facilitated.

(Third Embodiment)

The third embodiment differs from the first embodiment in the die used. While the die used in the first embodiment includes the fixed die **51**, the movable die **52**, the fixed-side center core **53** and the sliding dies **54** (see FIG. **5**), the fixed die **51** in the first embodiment is replaced by sliding dies capable of sliding in the die used in the third embodiment.

FIG. **6** shows the die used in the third embodiment. Since structural features other than the die are identical to those in the first embodiment, an explanation is given by referring to the figures illustrating the first embodiment as necessary. FIG. **6** illustrates the die viewed along the direction indicated by the arrow D1 in FIG. **4**A. It differs from the die in FIG. **5** illustrating the first embodiment in that the fixed die **51** in FIG. **5** is replaced with sliding dies **60**. The six sliding dies **54** through **60** each slide in the direction indicated by the arrows.

As described above, in the third embodiment having all the dies for regulating the position of the reinforcement ring **2** along the radial direction constituted as sliding dies, the process of inserting the reinforcement ring **2** mounted at the mounting tool **55** into the die is further facilitated. In other words, while the reinforcement ring **2** is inserted in close contact with the fixed die **51** in the first embodiment, the reinforcement ring **2** is inserted with ample play in the third embodiment. As a result, the design of the mechanism through which the reinforcement ring **2** is inserted at the die is simplified, and the process management in the bayonet mount production is facilitated as well.

(Fourth Embodiment)

FIGS. **7**A and **7**B respectively present a sectional view and a front view of the fourth embodiment of the bayonet mount **20** according to the present invention. FIG. **7**B is a front view of the bayonet mount **20** taken from the camera main body side and FIG. **7**A is a sectional view taken along A—A in FIG. **7**B. FIG. **8** is an enlargement of FIG. **7**A.

Since the bayonet mount **20** in the fourth embodiment is identical to the bayonet mount **10** in the first embodiment except for its holes **1***i*, the same reference numerals are assigned to identical components to preclude the necessity for a repeated explanation thereof.

The bayonet mount **20** includes three holes **1***i* provided on the camera main body side that reach the reinforcement ring **2**. The holes **1***i* are left by the projecting portions of the fixed-side center core (not shown) having held the reinforcement ring **2** during the molding process, and unlike in the first embodiment, the holes continue through the internal diameter portion of the reinforcement ring **2**. Thus, the projecting portions of the fixed-side center core regulate the position of the reinforcement ring **2** from the internal diameter side as well.

FIG. **9** shows the die used in the fourth embodiment viewed along the direction indicated by the arrow D1 in FIG. **4**A. The die is identical to the die used in the third embodiment (see FIG. **6**), except for its projecting portions **53***b* at the fixed-side center core. There are three projecting portions **53***b* as shown in FIG. **9**. FIG. **9** shows the projecting portions **53***b* to facilitate the explanation, although the projecting portions **53***b* provided at the fixed-side center core **53** are hidden by the sliding dies **54** when the sliding dies **54** are lowered to hold the reinforcement ring **2**. It is to be noted that the front ends of the projecting portions **53***b* have an L-shaped cross section so as to regulate the position of the reinforcement ring **2** along the direction of the optical axis and also along the radial direction from the internal diameter side.

The molding process is implemented as in the first embodiment to complete the production of the bayonet mount **20** formed as shown in FIGS. **7**A and **7**B.

As described above, by adopting the fourth embodiment in which the positional regulation is implemented from the internal diameter side as well through a method similar to that adopted in the first embodiment, the position of the reinforcement ring **2** is determined with a greater degree of ease and the degree of positional accuracy is further improved while minimizing the production costs as in the first embodiment.

(Fifth Embodiment)

FIGS. **10**A~**10**C show the reinforcement ring **12** achieved in the fifth embodiment. FIG. **10**A shows the reinforcement

ring **12** viewed from the lens side, FIG. **10**B presents a side elevation and FIG. **10**C shows the reinforcement ring **2** viewed from the camera main body side. The reinforcement ring **12** is a member achieved by machining stainless steel through press-machining such as drawing, and includes three tab reinforcements **12***a* on the camera main body side and a continuous slip-stop portion **12***b* on the lens side.

In the reinforcement ring **12** in the fifth embodiment, a projection **13** is provided at the slip-stop portion **12***b* in order to regulate the position of the reinforcement ring **12** along the rotational direction. The projection **13** includes end surfaces **13***e* and **13***f* and is used to regulate the position of the reinforcement ring **12** along the rotational direction when the reinforcement ring **12** is inserted at the mounting tool **55**, as in the second embodiment. The projections that interlock with the end surfaces **13***e* and **13***f* of the projection **13** are provided at the sleeve **56**. As a result, the position of the reinforcement ring **12** along the rotational direction relative to the die becomes regulated. Since the method adopted to mount the reinforcement ring **12** during the insert-molding process and the molding method adopted in the embodiment are identical to those in the second embodiment, their explanation is omitted.

As described above, since the slip-stop portion **12***b* at the reinforcement ring **12** is constituted as a continuous portion in the fifth embodiment, even more reliable reinforcement is achieved. In particular, the reinforcement ring **12** becomes separated from the mold member less readily even when a load is applied to the tab portions of the bayonet mount.

(Variations)

The present invention is not limited to the examples presented in the embodiments explained above and it will be understood by those skilled in the art that various changes can be made therein and they are equivalent to the invention.

(1) While the holes **1***h* or the holes **1***i* are provided in the embodiments to enable positioning of the reinforcement ring **2** along the direction in which the optical axis extends, the present invention is not limited to this example. Several projecting portions may be formed at the reinforcement ring **2** to be placed in contact with the die. In this structure, no holes are bored and instead, the projecting portions will be exposed at a plurality of positions.

(2) While the reinforcement rings **2** and **12** are formed through press-machining in the embodiments explained above, the present invention is not limited to this example. For instance, the reinforcement ring **2** may be formed through planing or through die casting.

(3) While the present invention is adopted in an interchangeable lens mount in the embodiments described above, the present invention is not limited to this example. For instance, it may be adopted in an intermediate ring or the like, or at may be adopted in a mount provided at the camera main body. Moreover, it may be adopted in an application other than a camera.

(4) While the reinforcement ring **2** is formed as an integrated part through insert-molding in the embodiments explained above, the present invention is not limited to this example. It may be, for instance, retained with screws or it may be bonded, instead.

(5) While the present invention is adopted in a bayonet mount used in a camera in the embodiments explained above, the present invention is not limited to this example. It may be adopted in all situations in which a given member is connected to another member through a method similar to bayonet mounting.

(6) While the present invention is adopted in a male bayonet mount in the embodiments explained above, the present invention is not limited to this example. It may be adopted in a female bayonet mount, instead.

(7) While the position along the rotational direction is regulated by using a single tab reinforcement **2***a* of a male bayonet mount in the first embodiment of the present invention, the present invention is not limited to this example. It may be adopted to regulate the position by using a plurality of tab reinforcements or it may be adopted to regulate the position by combining the ends of a plurality of tab reinforcements. In other words, all modes in which the position along the rotational direction is regulated by using a tab reinforcement are within the scope of the present invention.

What is claimed is:

1. A bayonet mount comprising:

a mount main body made of resin including a bayonet tab made of resin provided along a direction of a circumference of said mount main body; and

a metal member to partially reinforce said bayonet tab at said mount main body and including a tab reinforcement to reinforce said bayonet tab and a cylindrical reinforcement formed in a cylindrical shape around said mount main body,

said tab reinforcement projecting out along a radial direction from a central axis of said cylindrical shape at an end surface of said cylindrical reinforcement,

said cylindrical reinforcement and said tab reinforcement being formed as an integrated unit and

said metal member being embedded in said mount main body.

2. A bayonet mount according to claim **1**, wherein:

said bayonet tab comprises a plurality of bayonet tab portions extending therefrom, and

said tab reinforcement comprises a plurality of tab reinforcement portions to reinforce said plurality of bayonet tab portions, said plurality of tab reinforcement portions being formed as an integrated part.

3. A bayonet mount according to claim **2**, wherein:

said metal member includes a plurality of slip-stop portions facing opposite said plurality of tab reinforcement portions, and

said plurality of tab reinforcement portions and said plurality of slip-stop portions are formed as an integrated unit.

4. A bayonet mount according to claim **2**, wherein:

said metal member includes a slip-stop portion facing opposite said plurality of tab reinforcement portions, and

said slip-stop portion is formed continuously along the direction of the circumference of said mount main body.

5. A bayonet mount according to claim **1**, wherein:

at least a part of said cylindrical reinforcement is exposed outside of said mount main body.

6. A bayonet mount according to claim **1**, wherein:

an end of said tab reinforcement along the direction of the circumference of said mount main body is exposed outside of said mount main body.

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