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Imazu et al.

(54) JOINT BOOT MADE OF RESIN

(76) Inventors: **Eiichi Imazu**, Osaka (JP); **Hiroshi Ohno**, Osaka (JP); **Katsushi Saito**, Osaka (JP)

Correspondence Address:
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614 (US)

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(57) **ABSTRACT**

In a joint boot made of resin comprising a small-diameter cylinder part, a large-diameter cylinder part and a bellows part interlinking both and molded by injection blow molding, the small-diameter cylinder part constituting an injection molding section, the production of a burr at a boundary between the injection molding section and a blow molding section will be suppressed. To that end, the boundary at an outer periphery of the boot between the injection molding section and the blow molding section is set on a bellows part side away from a recess for fixation of the small-diameter cylinder part. In particular, a shoulder portion of the recess for fixation on the bellows part side is provided with a cutout portion, in which to set the boundary between the injection and the blow molding sections.

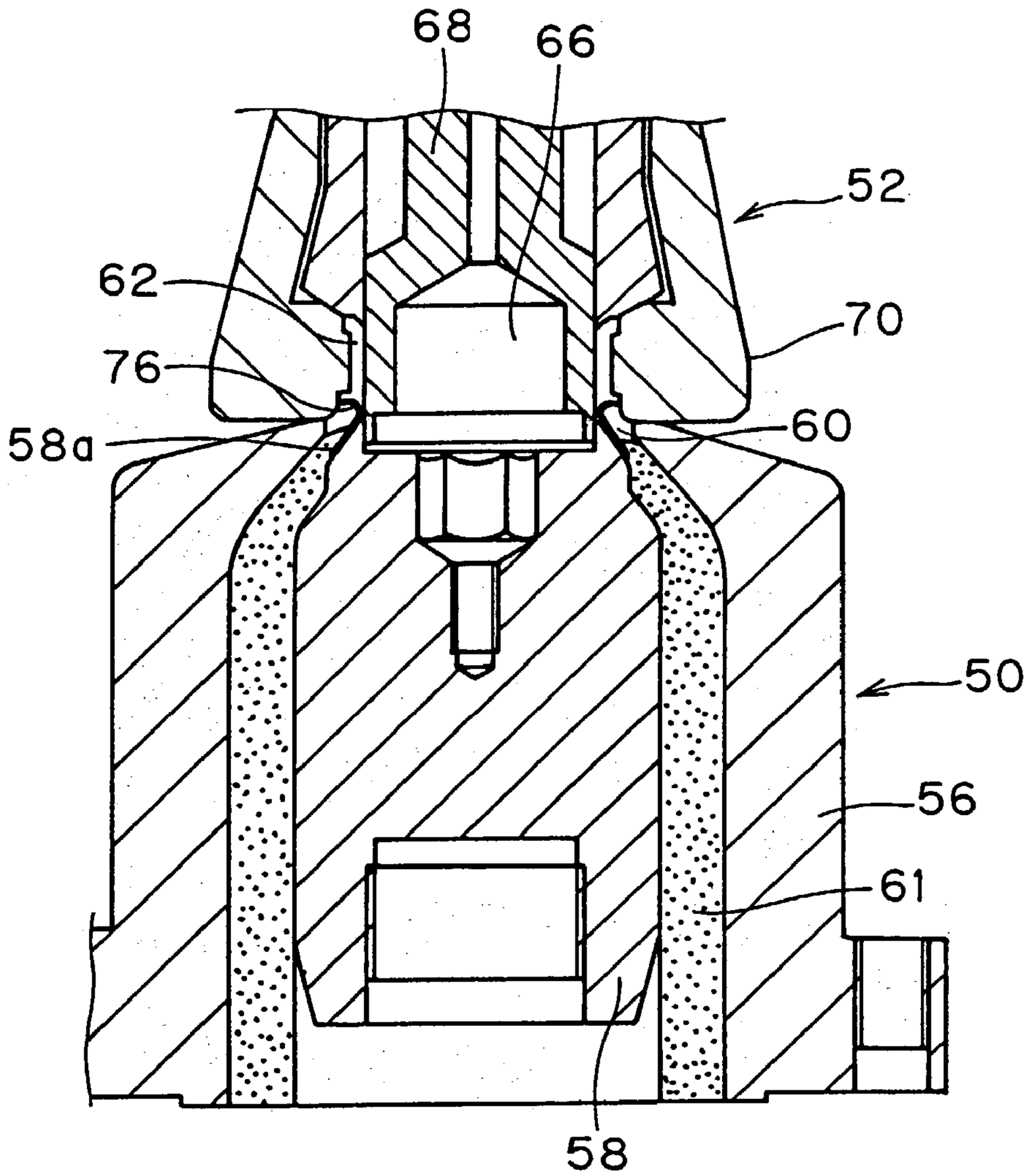


FIG. 1

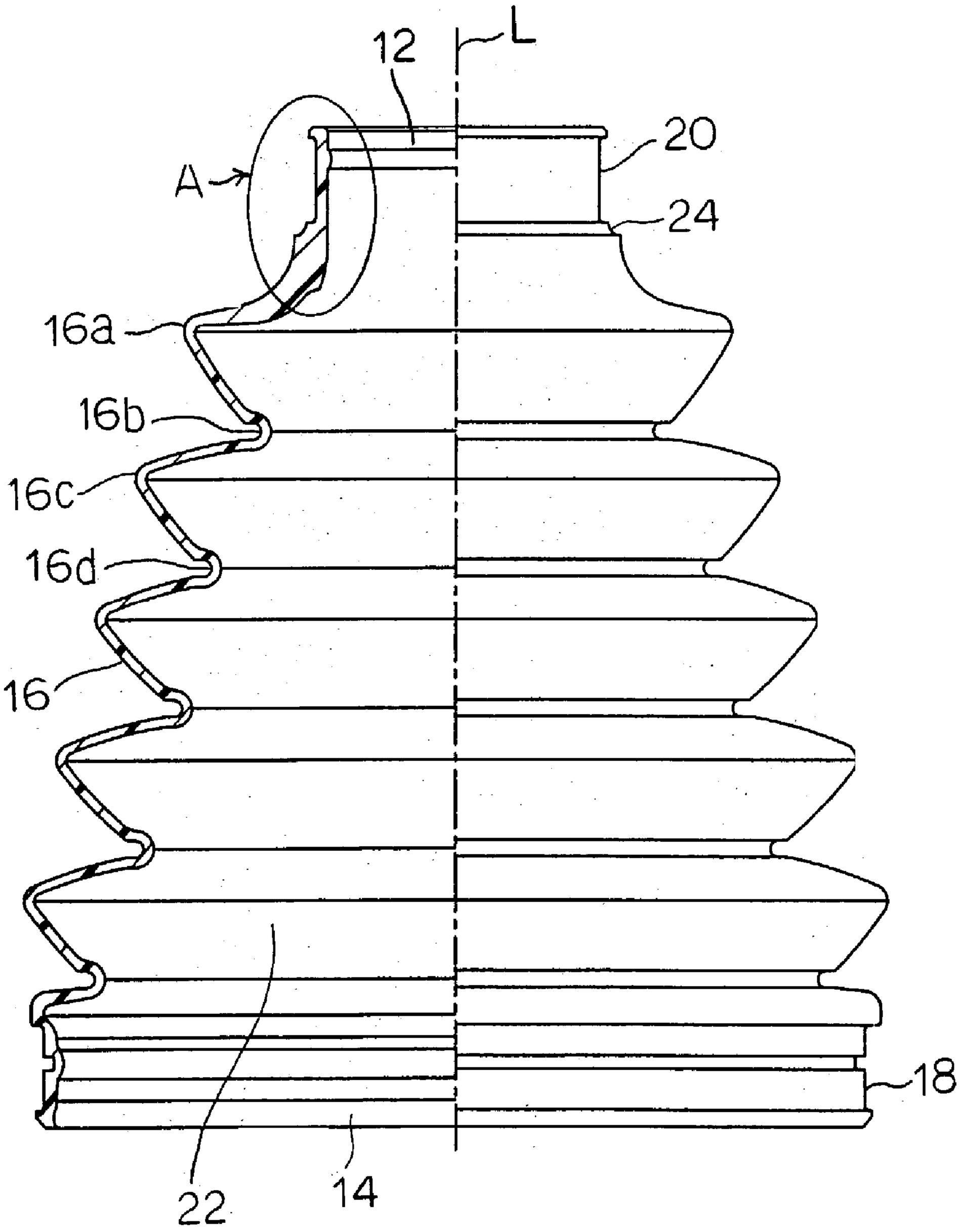


FIG. 2

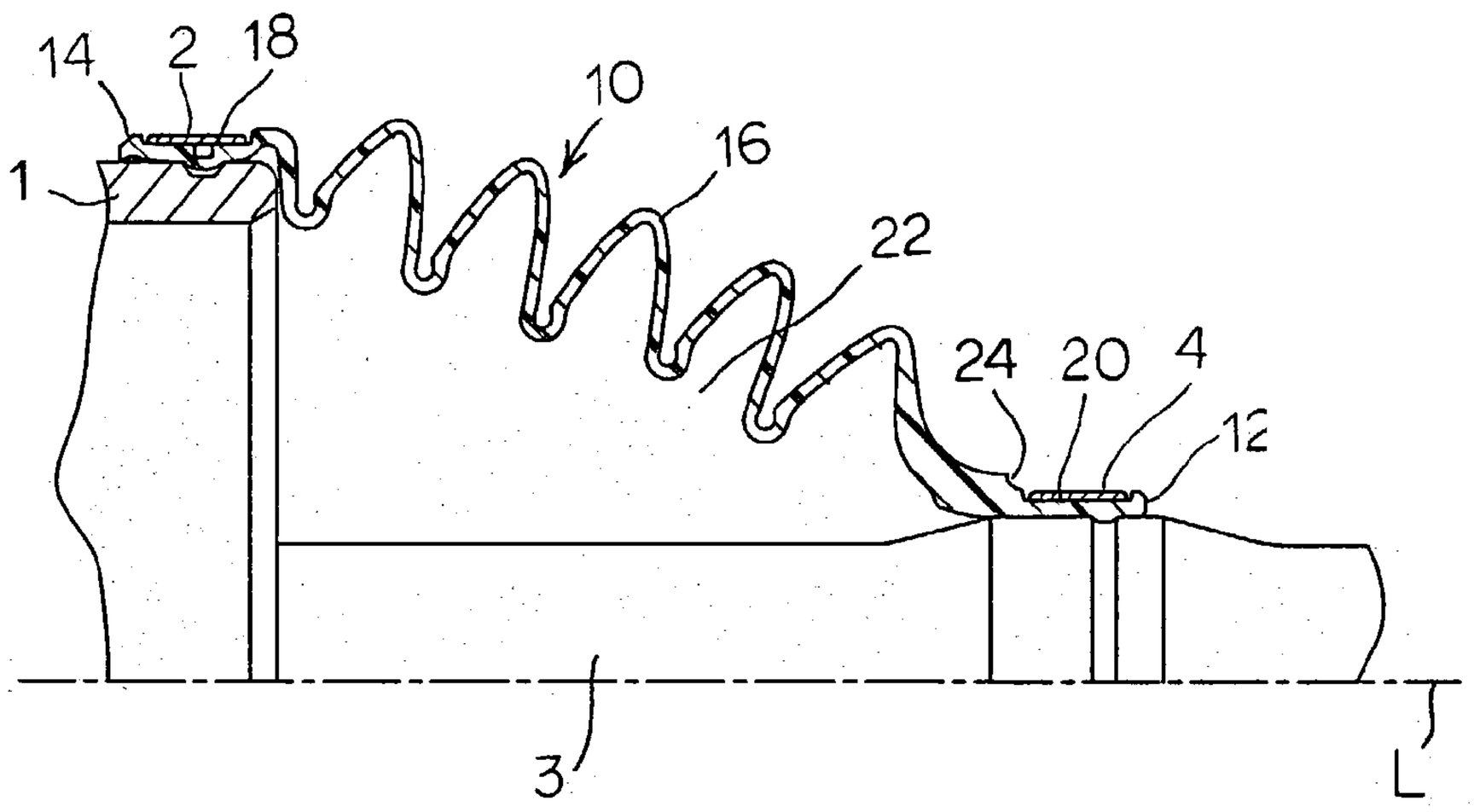

14
2
18
10
1
16
22
24
20
4
12
3
L

FIG. 3

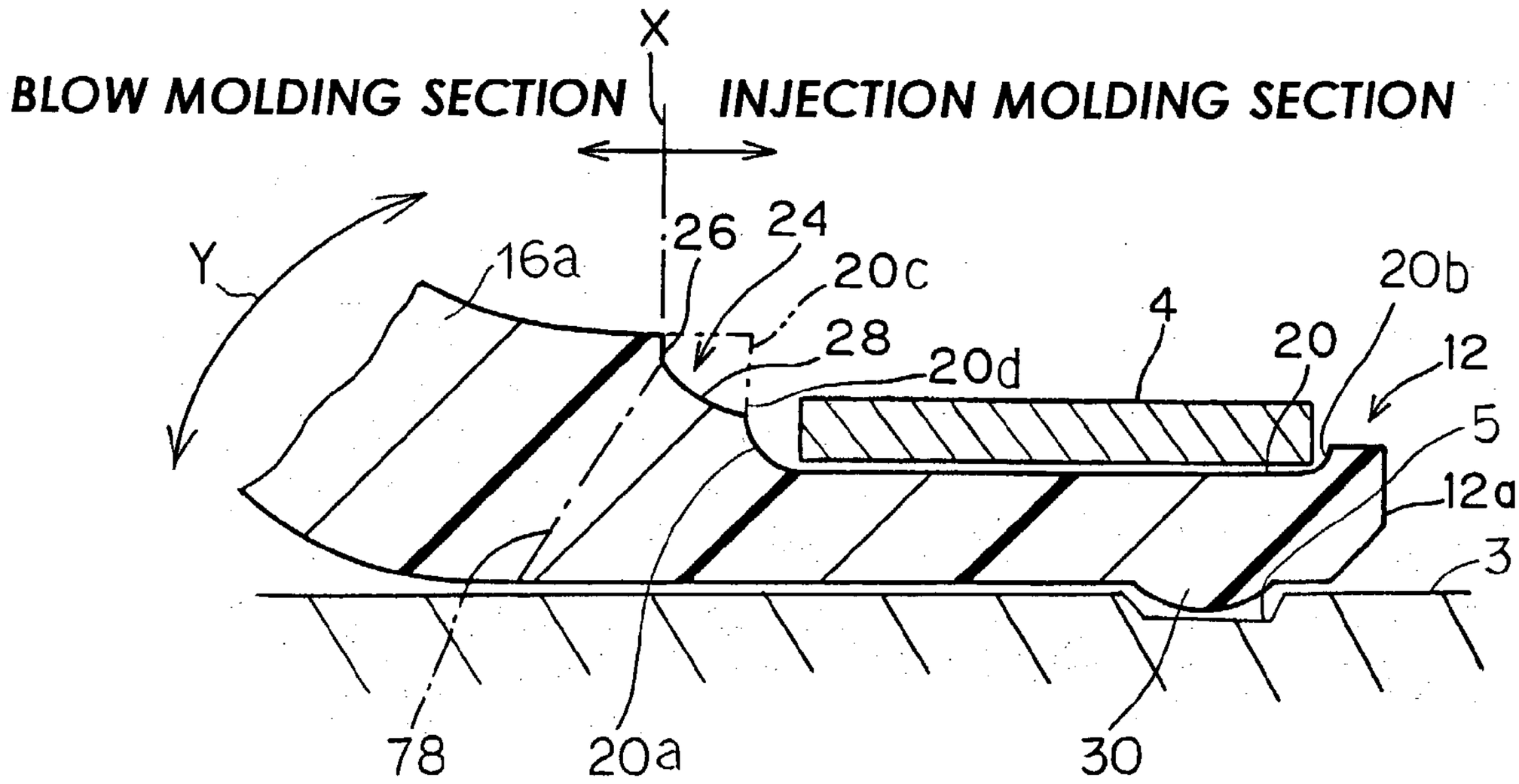

X
BLOW MOLDING SECTION
INJECTION MOLDING SECTION
Y
16a
26
24
20c
28
20d
4
20
20b
12
5
12a
3
78
20a
30

FIG. 4

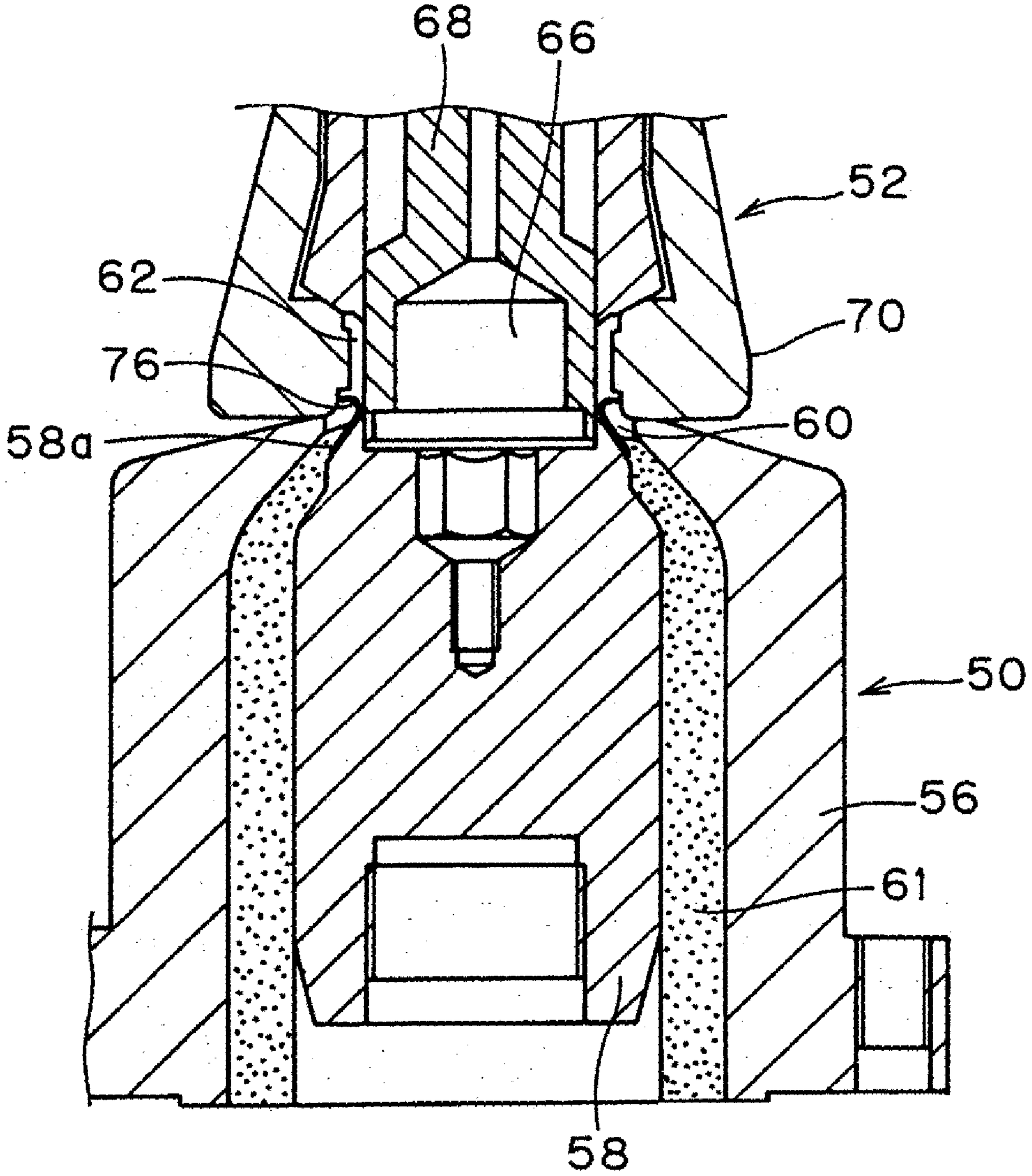


FIG. 5

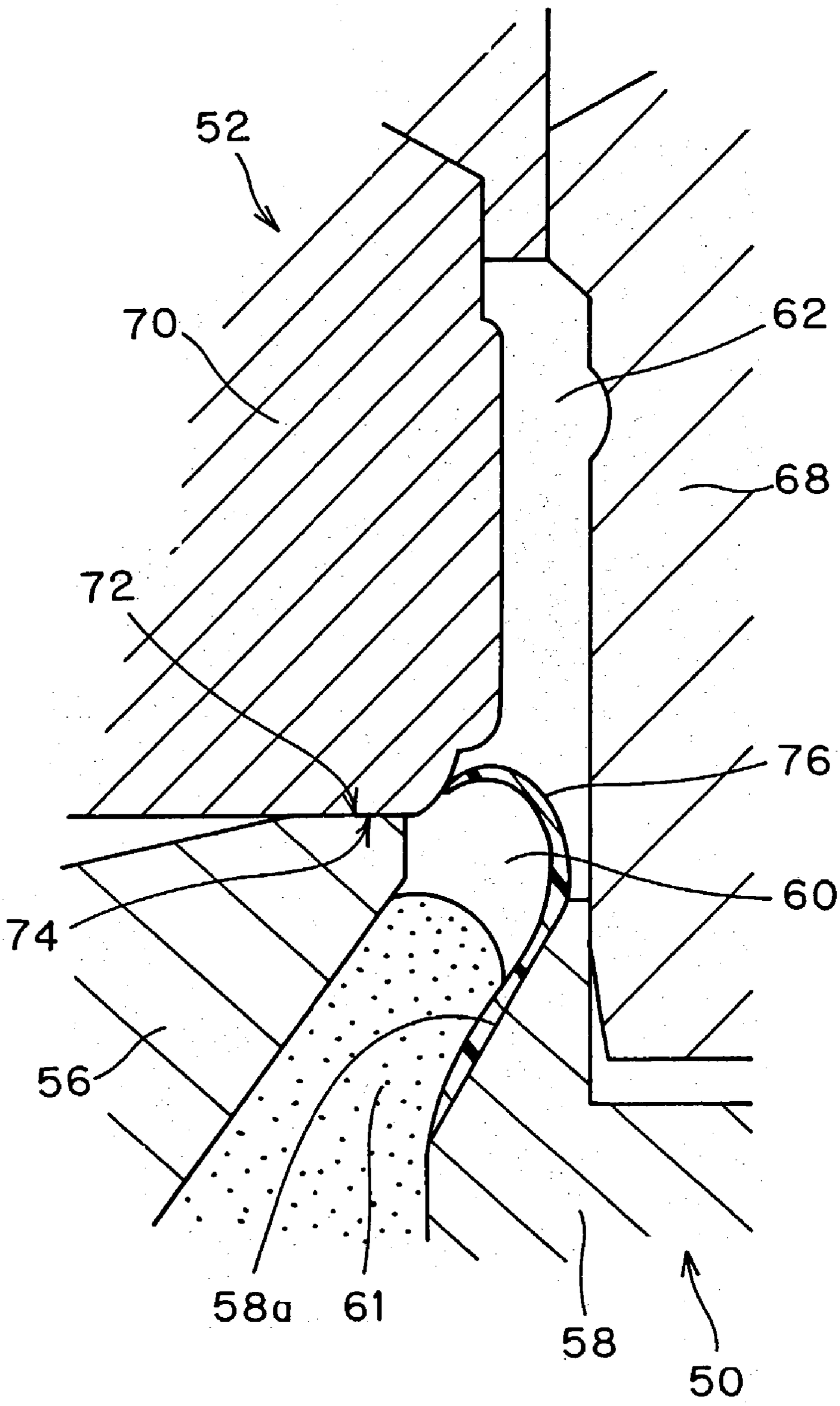


FIG. 6

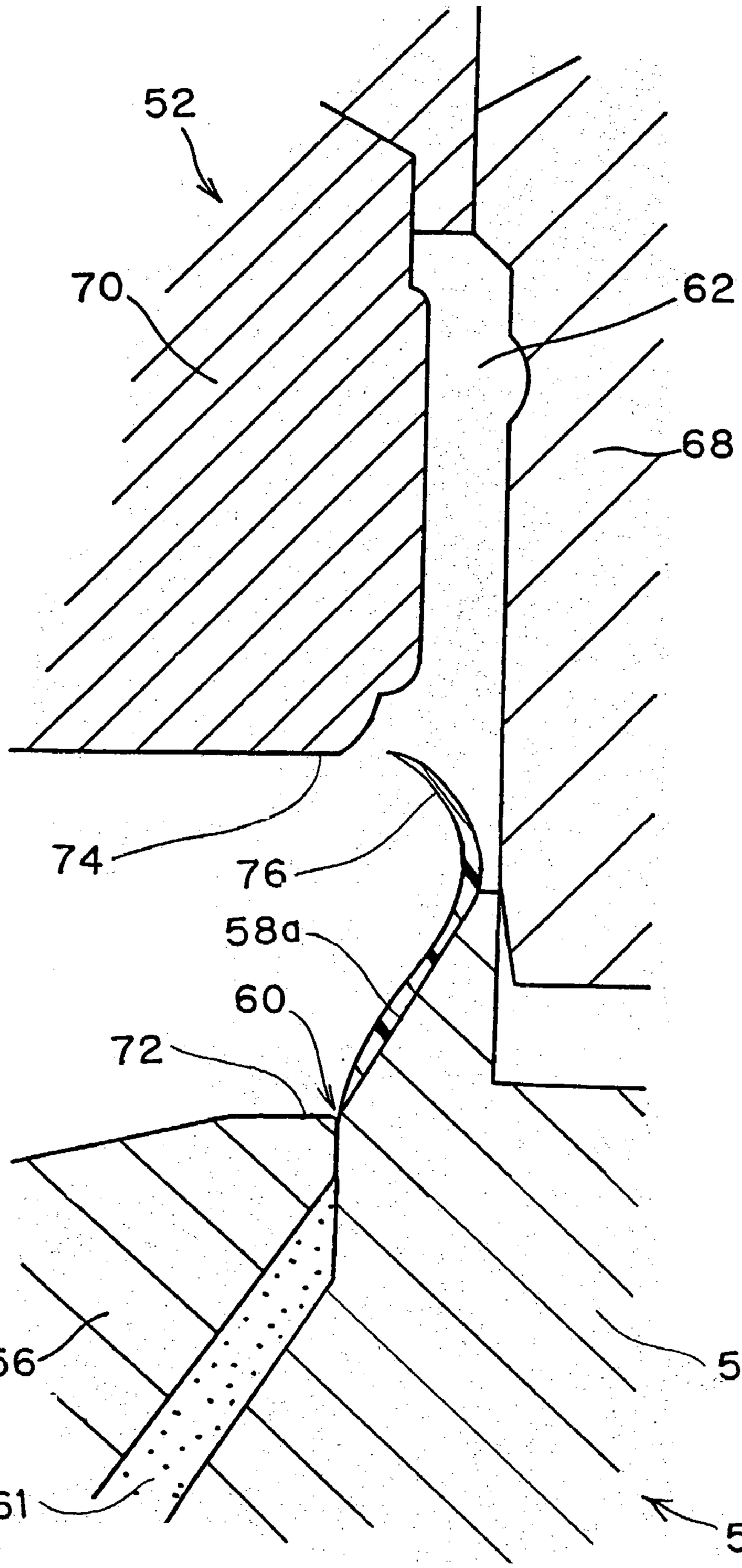


FIG. 7

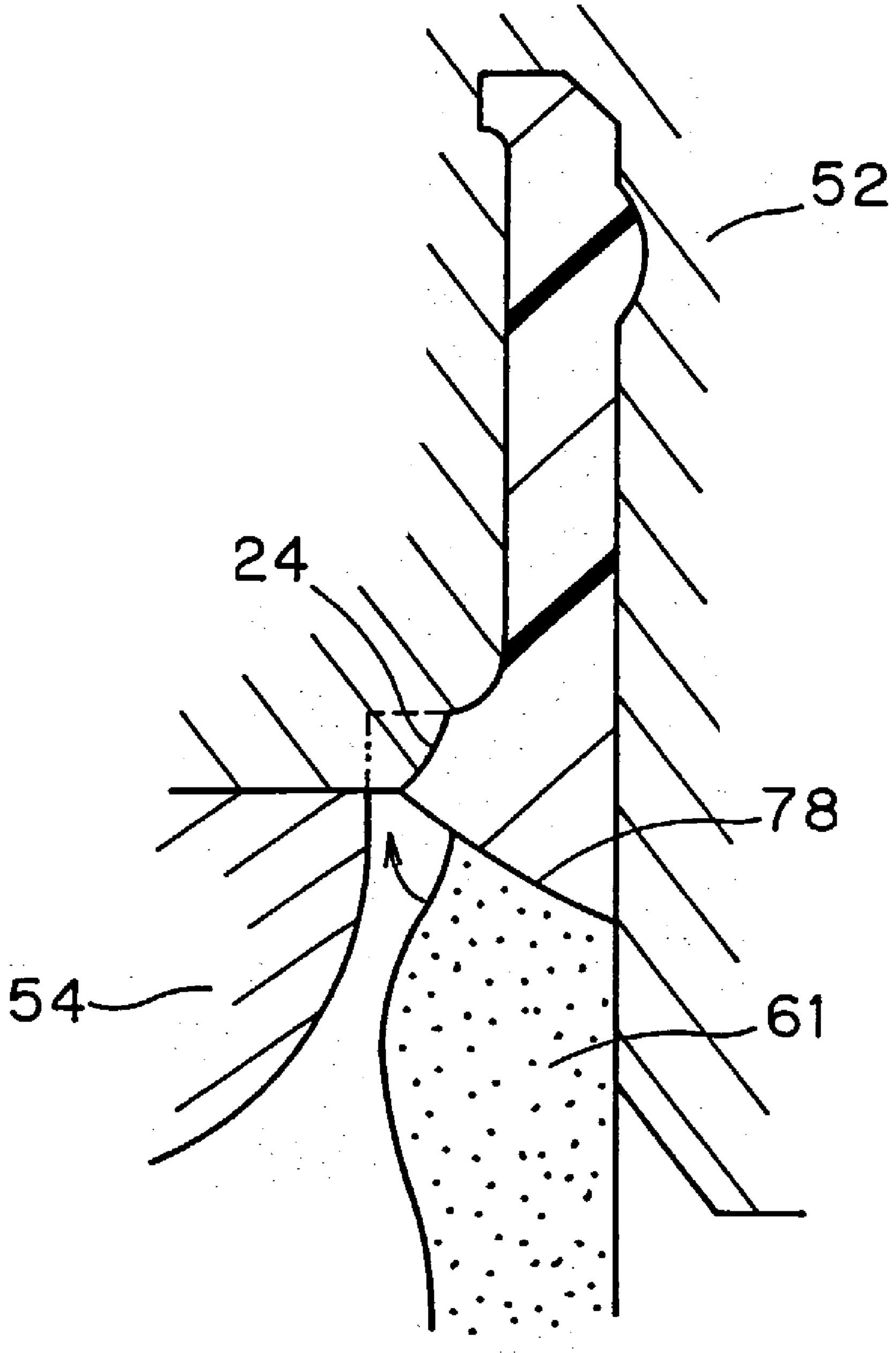


FIG. 8D

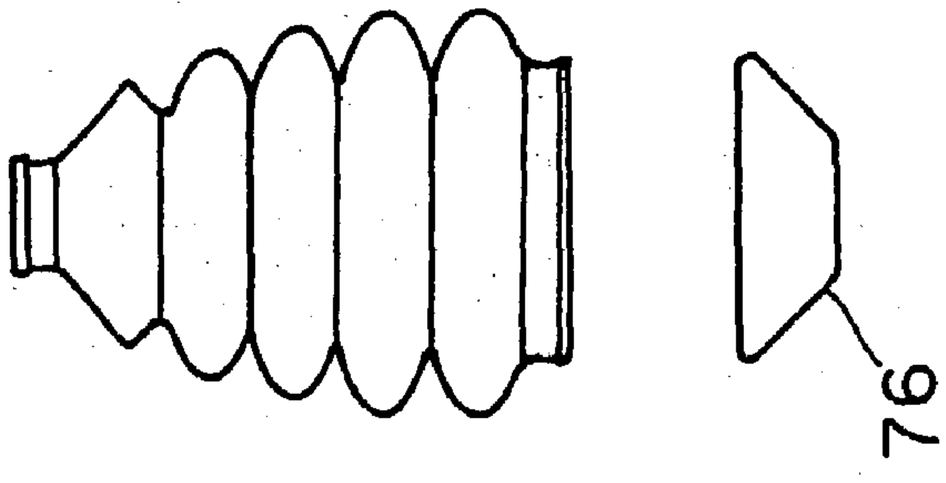


FIG. 8C

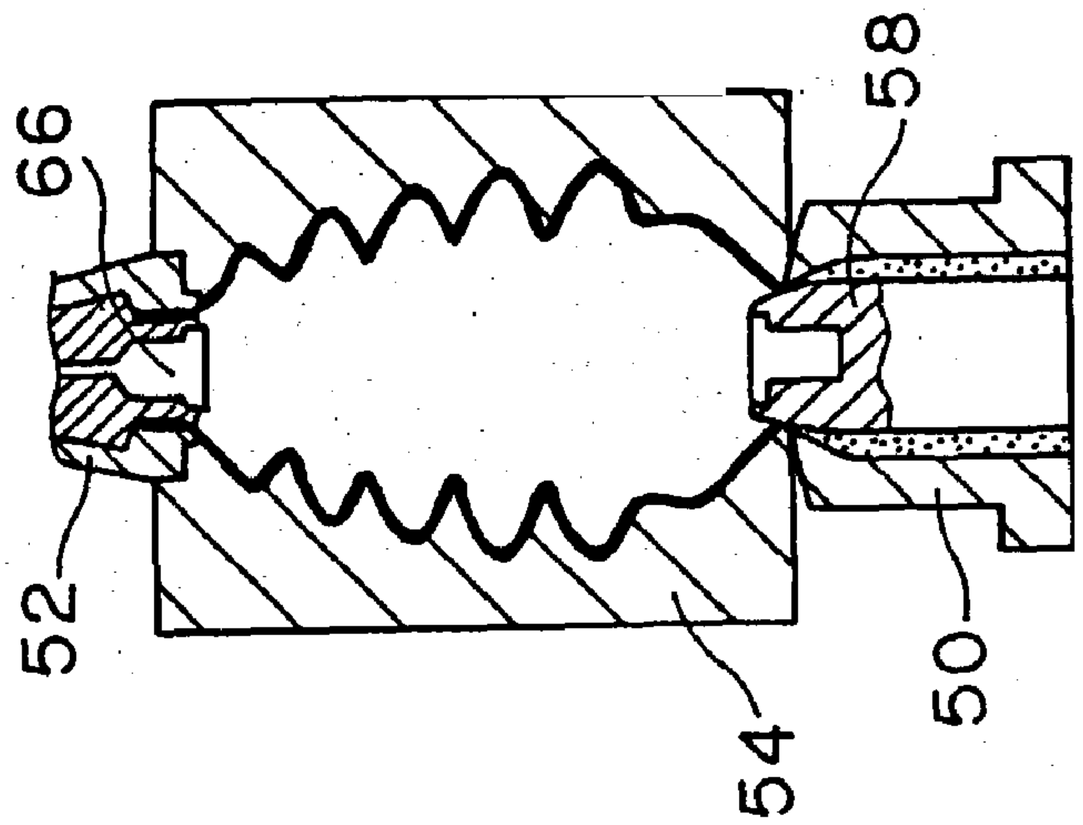


FIG. 8B

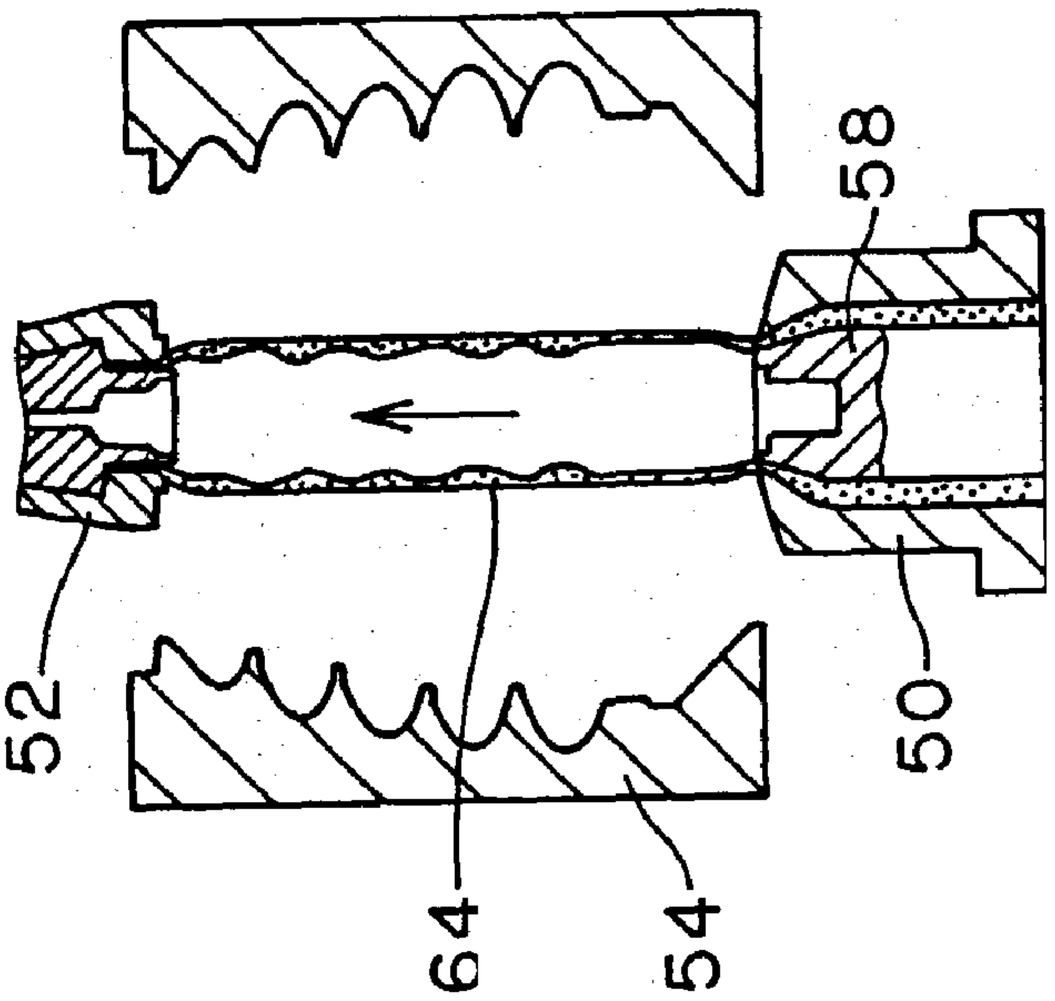


FIG. 8A

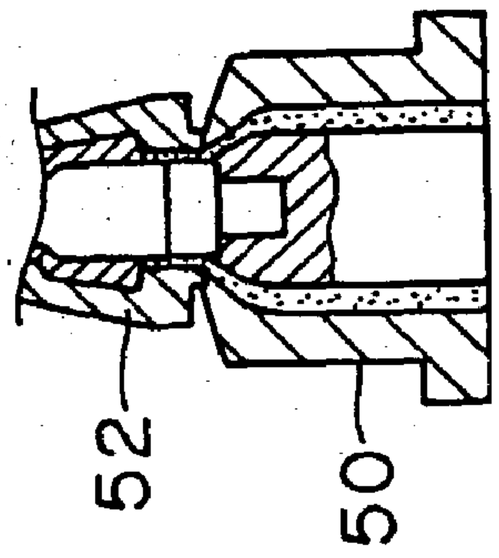


FIG. 9

PRIOR ART

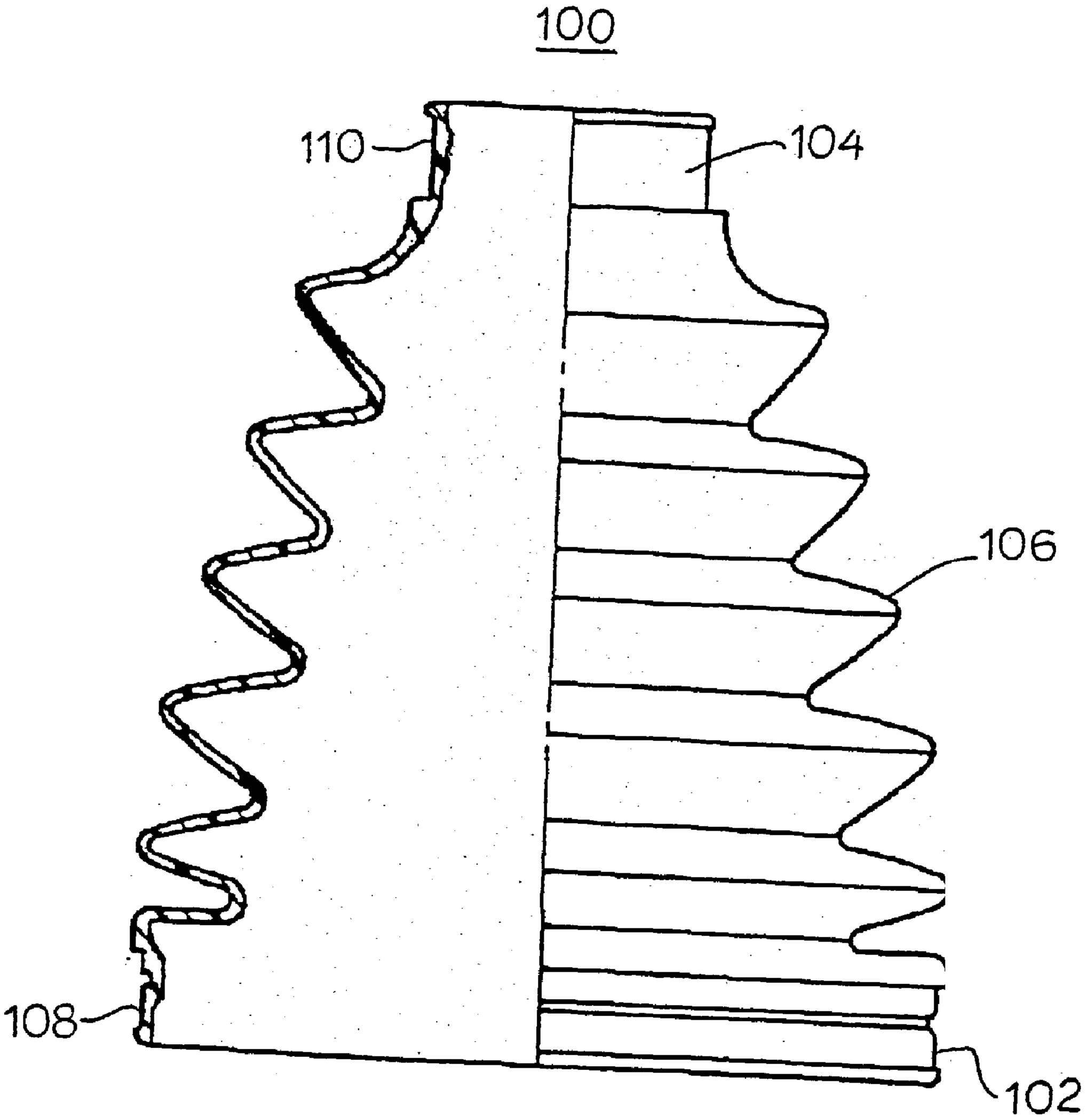


FIG. 10

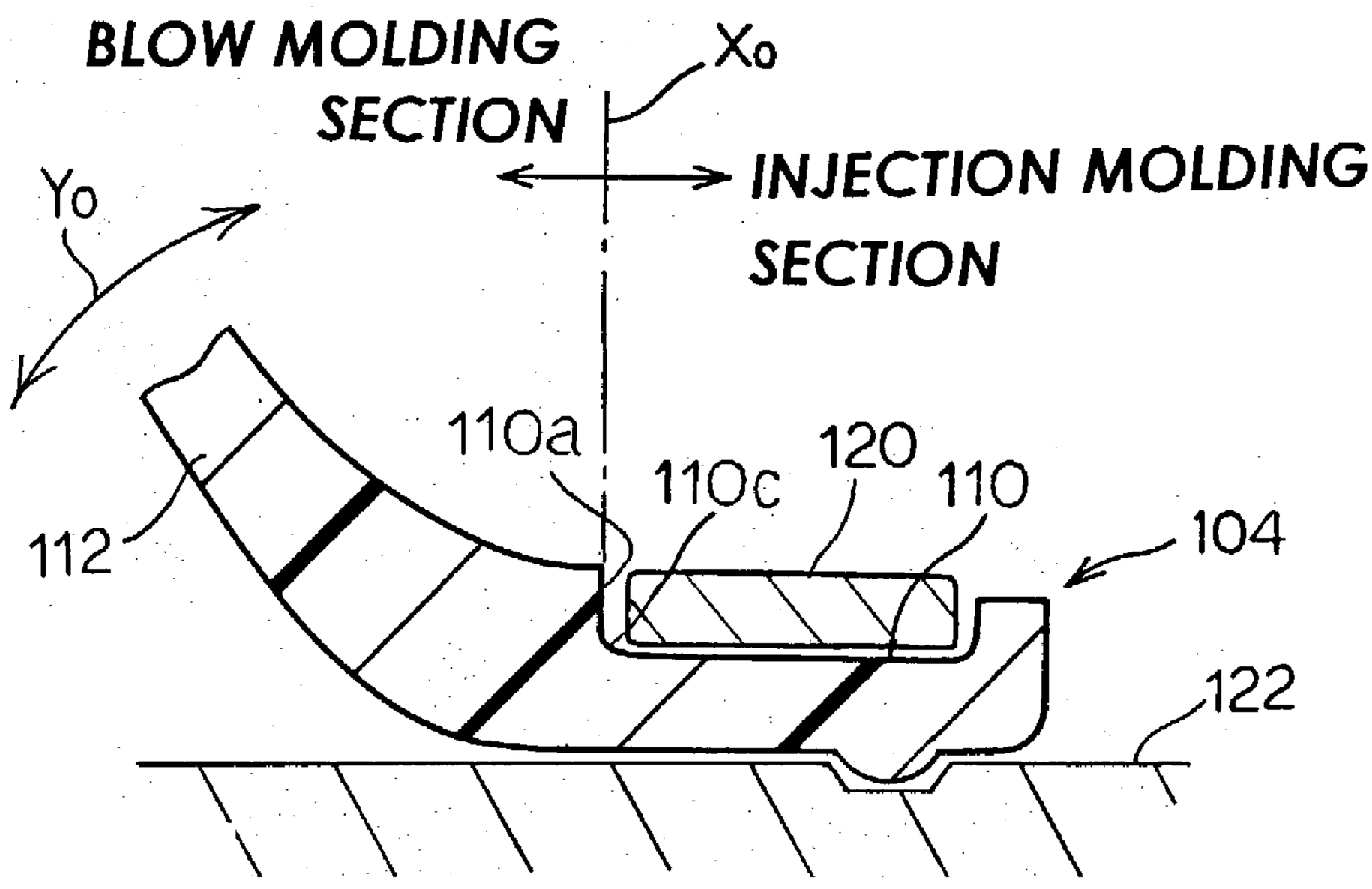

BLOW MOLDING SECTION
Xo
INJECTION MOLDING SECTION
Yo
110a
110c
120
110
104
112
122

FIG. 11

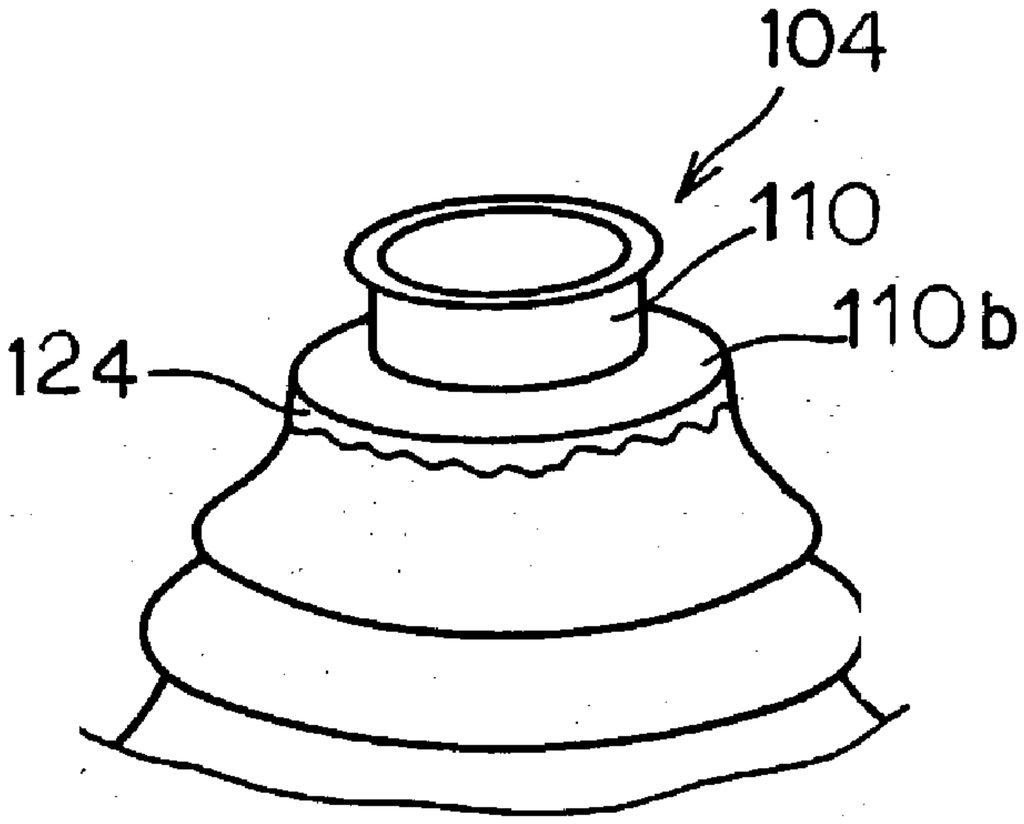

104
110
110b
124

FIG. 12A

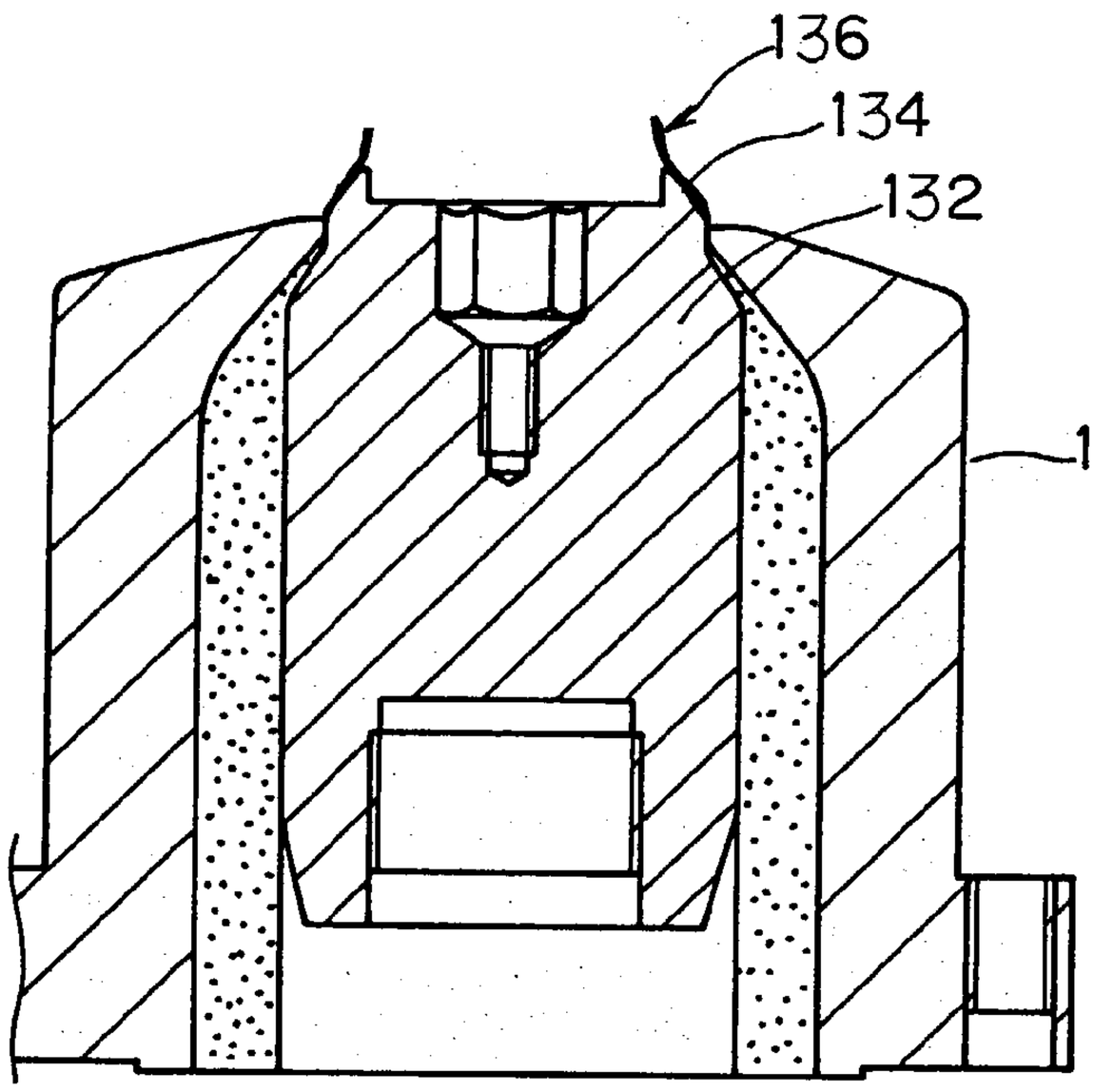
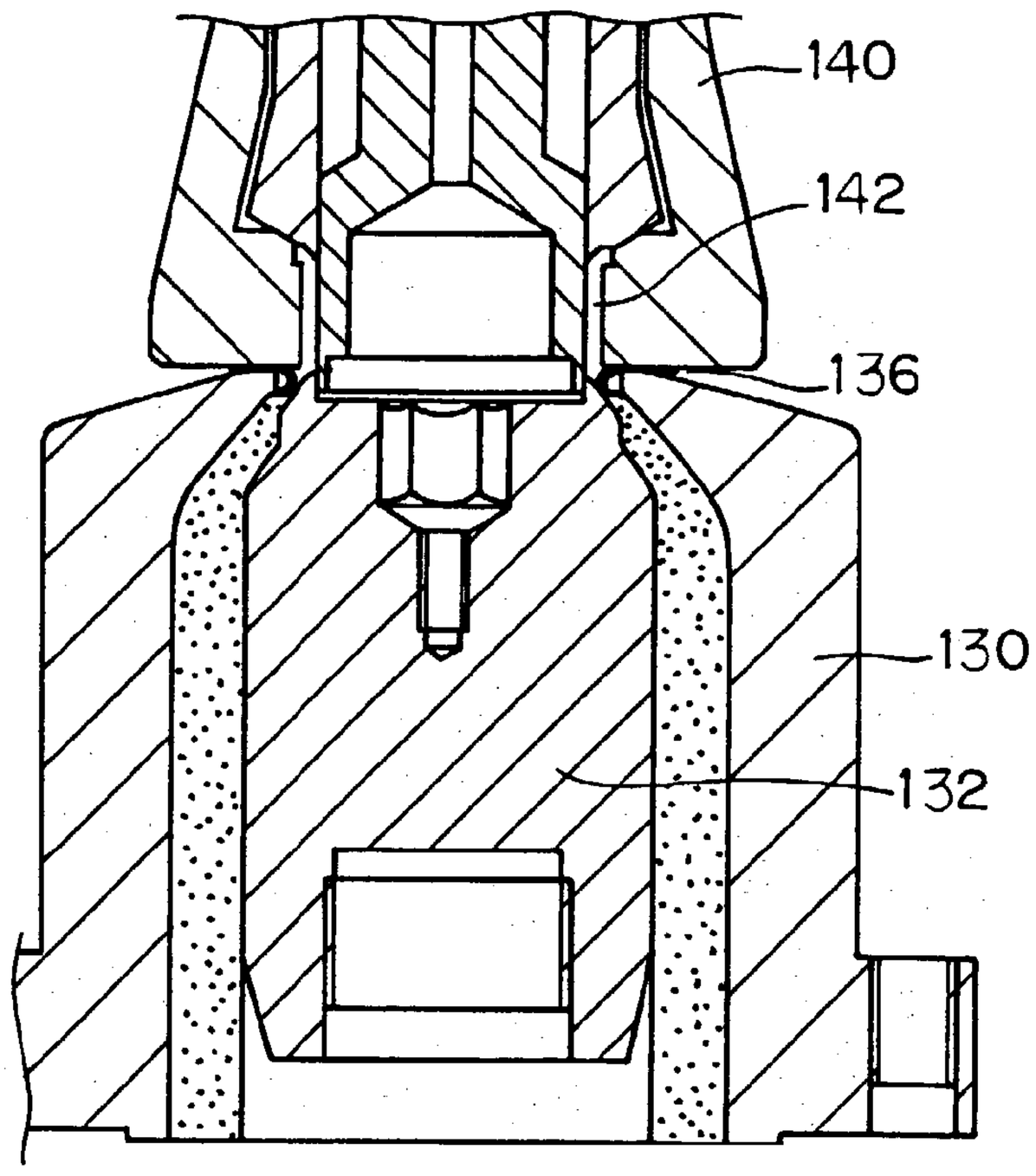


FIG. 12B



JOINT BOOT MADE OF RESIN

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to a joint boot made of a resin, and more particularly to a bellows-like joint boot made of resin for use in a constant velocity joint for automotive vehicles or the like.

[0003] 2. Description of Related Art

[0004] A joint of a driving shaft for automotive vehicles or industrial machines is equipped with a joint boot in order to maintain the grease encapsulated therein or to prevent the dirt or the like from entering.

[0005] As illustrated in **FIG. 9, a** typical joint boot **100** is made up of a large-diameter cylinder part **102** to be fitted on a housing part of a constant velocity joint, a small-diameter cylinder part **104** disposed coaxially to be spaced apart from the large-diameter cylinder part **102** and adapted to be fitted to a shaft, and a bellows part **106** interlinking both parts. On outer circumferential surfaces of the large-diameter cylinder part **102** and the small-diameter cylinder part **104**, there are provided respectively recesses **108**, **110** for fixation for receiving therein respective fastening clamps. The small-diameter cylinder part **104** is, as shown in **FIG. 10**, fixed on an outer periphery of a shaft **122** with the aid of a ring-form fastening clamp **120** mounted on the recess **110** for fixation. The large-diameter cylinder part **102** is likewise fixed, although not shown, on an outer periphery of the housing part.

[0006] The joint boot of this type can be molded by an injection blow molding procedure of a thermoplastic resin. In that case, an extrusion dye **50** and an injection mold **52** are matched as shown in **FIG. 8A and a** melted resin is injected from the extrusion dye **50** into the cavity of the injection mold **52**. Then while moving the injection mold **52** upwardly, a parison **64** is drawn out as shown in **FIG. 8**B, and a blow mold **54** is closed to conduct a blow molding by admitting gas into the parison **64**, as shown in **FIG. 8C**. By subsequent demolding and cutting out of a bottom section **76** as shown in **FIG. 8**D, the joint boot made of resin is thus molded.

[0007] Where a joint boot is molded by the injection blow molding procedure in this way, it is a conventional practice to set a boundary X_0 between the injection molding section and the blow molding section, as shown in **FIG. 10**, to be within the recess **110** for fixation, which is defined at the outer periphery of the small-diameter cylinder part **104**, more particularly on a wall surface **110***a* on the bellows part side of the recess **110**. The setting of the boundary X_0 within the recess **110** for fixation however runs into the problem that, as indicated in **FIG. 11, a** burr **124** is likely to be produced at a shoulder portion **110***b* on the bellows part side of the recess **110** for fixation.

[0008] According to the present inventors, the production of the burr **124** has been turned out to be ascribed to the mechanism that will be described below: That is, when the extruder die and the molding product are separated from each other after blow molding, as shown in **FIG. 12A, a** melted resin **136** in a drawn state clings to a taper surface **134** at a top of a core **132** of the extruder die **130**. When it proceeds to the next molding step in the state of the residual resin **136** clinging like this, in matching an injection mold **140** to the extruder die **130** as shown in **FIG. 12**B, the residual resin **136** catches on the outer peripheral edge of an opening of a cavity **142**, thereby being extended radially outwardly and ultimately pinched between the extruder die **130** and the injection mold **140**. As a consequence, the residual resin **136** remains on the molded product, as a result of which the burr is produced at the boundary between the injection molding section and the blow molding section.

[0009] On the other hand, a problem with the conventional resin joint boot of this kind is that since above all, the small-diameter cylinder part causes cracking at its recess for fixation when rotated in the state of a bending deformation at a wide angle, the joint boot is poor in durability. This is due to the fact that in particular, on the small-diameter cylinder part side, a first crest portion **112** of the bellows part **106** adjacent to the small-diameter cylinder part **104** is subjected to recurring deformation in the directions as indicated in an arrow Y_0 when rotated under bending deformation at a wide angle, as shown in **FIG. 10** and consequently, a stress due to it acts on an extremity **110***c* of the recess **110** for fixation on the bellows part **106** side.

SUMMARY OF THE INVENTION

[0010] An object of this invention is to provide a joint boot made of resin capable of suppressing the production of a burr at a boundary between an injection molding section and a blow molding section.

[0011] Another object of this invention is to provide a joint boot made of resin having a good durability by suppressing the occurrence of cracking at the recess for fixation.

[0012] The present invention firstly provides a joint boot made of resin which is made up of a first cylinder part, a second cylinder part, and a bellows part integrally linking both and molded by injection blow molding procedure, the first cylinder part being of an injection molding section, wherein the first cylinder part is provided on its outer periphery with a recess for fixation, and a boundary, on an outer surface of the boot, between the injection molding section and a blow molding section is set on a bellows part side away from the recess for fixation.

[0013] According to the first joint boot made of resin, because of the fact that the boundary between the injection molding and the blow molding sections is thus set not within the recess for fixation, but at a position on the bellows part side, an outer peripheral edge of the cavity opening of an injection mold is made larger as compared with the case where the boundary is provided in the recess. Consequently, in matching the injection mold to an extruder die, the residual resin clinging to the core upon previous molding is accommodated within the cavity without being caught on the outer peripheral edge of the cavity opening, so that it is hard to be pinched between the injection mold and the extruder die. Stated another way, the residual resin clinging to the core is accommodated within a cavity space as a newly formed injection molding portion due to the fact that the boundary is displaced toward the bellows part side, and the next melted resin is injected, in this condition, into the cavity. On that account, the production of the burr at the boundary between the injection molding section and the

blow molding section is restrained, whereby the rejection ratio upon molding can be significantly reduced.

[0014] In the aforementioned first joint boot made of resin, a shoulder portion of the recess for fixation on the bellows part side may be provided with a cutout portion, in which the boundary between the injection molding section and the blow molding section is set. Thereby it is possible to suppress the occurrence of cracking at the interface between the injection molding section and the blow molding section thereby enhancing the durability. In this case, the cutout portion may be comprised of a vertical area falling radially inwardly from an outer periphery of the first cylinder part and a slope area extending from an inward end of the vertical area to a wall surface of the recess for fixation. The slope area may be a curved plane.

[0015] In the first joint boot made of resin it is preferred that the first cylinder part be a small-diameter cylinder part and the second cylinder part be a large-diameter cylinder part coaxially disposed to the small-diameter cylinder part.

[0016] The present invention secondly provides a joint boot made of resin which is made up of a first cylinder part, a second cylinder part, and a bellows part interlinking both, wherein the first cylinder part is provided at its outer periphery with a recess for fixation, and a shoulder portion of the recess for fixation on the bellows part side is provided with a cutout portion.

[0017] With the second joint boot made of resin thus constructed, due to the fact that the shoulder portion of the recess for fixation on the bellows part side is cut out to provide the cutout portion, the volume of the shoulder portion is reduced, which can alleviate a stress imposed upon the extremity of the recess for fixation on the bellows part side. As a consequence, it is possible to enhance the durability of the joint boot made of resin. Since the problem of cracking ascribable to the stress is caused particularly on the small-diameter cylinder part side, it is further preferred that the first cylinder part be a small-diameter cylinder part and the second cylinder part be a large-diameter cylinder part coaxially arranged to the small-diameter cylinder part.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] **FIG. 1** is a half sectional, half side elevational view of a joint boot made of resin pertaining to one embodiment of this invention;

[0019] **FIG. 2** is a half sectional view of the joint boot showing its installing state to a constant velocity joint;

[0020] **FIG. 3** is an enlarged view of a circumscribing part A in **FIG. 1**;

[0021] **FIG. 4** is a sectional view of the joint boot when injection molded;

[0022] **FIG. 5** is an enlarged sectional view of a main part of **FIG. 4**;

[0023] **FIG. 6** is a sectional view showing a previous state to the state of **FIG. 5**;

[0024] **FIG. 7** is an enlarged sectional view of a main part of the joint boot when blow molded;

[0025] **FIG. 8A** to **FIG. 8D** are diagrammatic views showing respective steps of an injection blow molding process;

[0026] **FIG. 9** is a half sectional, another half side elevational view of a conventional joint boot made of resin;

[0027] **FIG. 10** is an enlarged sectional view of a small-diameter cylinder part of the conventional joint boot;

[0028] **FIG. 11** is a partly enlarged, perspective view of the conventional joint boot; and

[0029] **FIG. 12A** and **FIG. 12B** are sectional views of the conventional joint boot when molded.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0030] A joint boot **10** made of resin relating to one embodiment of this invention will be hereinafter described with reference to the drawings.

[0031] The joint boot **10** made of resin in this embodiment is a boot made of a thermoplastic elastomer resin to be mounted on an automotive constant velocity joint, and comprises, as illustrated in **FIGS. 1 and 2**, a small-diameter cylinder part **12**, a large-diameter cylinder part **14** coaxially disposed to be spaced apart from the small-diameter cylinder part **12**, and a bellows part **16** integrally linking these small-diameter cylinder part **12** and large-diameter cylinder part **14**.

[0032] The large-diameter cylinder part **14** assumes a short cylinder form so as to be externally fitted and secured to a top end of a cylindrical housing part **1** of a constant velocity joint on its outer periphery by means of a fastening clamp **2**, and is provided on its outer periphery with a recess **18** for fixation for receiving the fastening clamp **2** which is ring-like, the recess for fixation extending circumferentially.

[0033] The small-diameter cylinder part **12** assumes a short cylinder form adapted to be fitted externally and secured to an outer periphery of a shaft **3** protruding from the housing part **1** by means of a fastening clamp **4** and is disposed coaxially, namely so as to have a common center line L to the large-diameter cylinder part **14**. A recess **20** for fixation extending circumferentially for receiving the ring-like fastening clamp **4** is also defined on an outer periphery of the small-diameter cylinder part **12**.

[0034] The bellows part **16** is of a cylindrical bellows body in cross-section with an aperture difference between both ends, which body internally forms a space **22** for encapsulating grease. The bellows part **16** comprises a plurality of alternately continuing crest portions and root portions, for example, a first crest portion **16***a*, a first root portion **16***b*, a second crest portion **16***c*, a second root portion **16***d*, and so on, in turn from the small-diameter cylinder part **12** side. The diameters of the crest portions and the root portions are set respectively to be progressively larger from the small-diameter cylinder part **12** to the large-diameter cylinder part **14**.

[0035] As illustrated in **FIG. 3**, the sectional configuration (sectional configuration passing through the center line L of the boot) of the small-diameter cylinder part **12** is such that both corner portions **20***a*, **20***b* on axially both sides of the recess **20** for fixation are formed as a curved plane. Further an upper part from the corner portion **20***a* of the recess **20** for fixation on the bellows part side, viz. a shoulder portion **20***c* on the bellows part side which stands up radially

outwardly is cut out over a whole circumference, whereby a cutout portion **24** extending circumferentially is defined at the shoulder portion **20***a*.

[**0036**] The cutout portion **24** includes a vertical area **26** falling radially inwardly from an outer periphery of the small-diameter cylinder part **12** and a slope area **28** extending from an inward end of the vertical area **26** to a wall surface **20***d* of the recess **20** for fixation on the bellows part side. The slope area **28** is inclined radially inwardly from a lower end of the vertical area **26**, viz. a radially inner end toward an opening edge **12***a* of the small-diameter cylinder part **12**. The slope area in the illustrated embodiment is formed, in the sectional configuration above, as a curved surface convex toward the inside of the boot.

[**0037**] In this embodiment, the cutout portion **24** is thus provided with the vertical area **26**, but it is also possible to cut out simply a taper area or curved area extending from the outer periphery of the small-diameter cylinder part **12** to the wall surface **20***d* of the recess **20** for fixation on the bellows part side without providing the vertical area like this thereby providing the cutout portion **24**.

[**0038**] The small-diameter cylinder part **12** is further provided, on its inner periphery, with a projecting streak **30** for sealing, which projects radially inwardly as indicated in **FIG. 3**. The projecting streak **30** for sealing is provided at a back side of the recess **20** for fixation and constructed so that the projecting streak in its fitting state in a recess **5** provided on an outer periphery of the shaft **3** may be secured by means of the fastening clamp **4** thus ensuring a sealing property of a space **22** for encapsulation of grease on the small-diameter cylinder part **12** side.

[**0039**] The joint boot **10** is molded by injection blow molding, the small-diameter cylinder part **12** side being made into an injection molding section, wherein a boundary between the injection molding section and a blow molding section, namely a boundary X on an outer surface of the boot between the injection molding section and the blow molding section is set, as shown in **FIG. 3**, not within the recess **20** for fixation, but rather within the small-diameter cylinder part **12** on the bellows part **16** side. In this embodiment, boundary X between the injection molding section and the blow molding section is set within the cutout portion **24**, more particularly so as to conform to the vertical area **26** of the cutout portion **24**. As illustrated in **FIG. 3**, an interface **78** between the injection molding section and the blow molding section is formed, in a thickness direction of the small-diameter cylinder part **12**, in the state that the more inboard side of the boot from the aforesaid boundary X is more inclined toward the bellows part side.

[**0040**] A molding assembly used for injection blow molding of the joint boot **10** in this embodiment is, as illustrated in **FIGS. 8A** to **8**C, provided with an extruder die **50** fitted at its top surface with an orifice capable of discharging a melted resin in a cylindrical form, an injection mold **52** capable of advancing or receding axially relative to the top surface of the extruder die **50**, and a blow mold **54** disposed between the extruder die **50** and the injection mold **52**.

[**0041**] The extruder die **50** as shown in **FIG. 4** is equipped with a die body **56** and a core **58** axially movable within it. The top surface of the extruder die **50**, viz. the upside is formed by the orifice **60** assuming an annular form between the die body **56** and the core **58** so that the orifice **60** can be opened or closed and its delivery amount can be adjusted by a vertical movement of the core **58**, as illustrated in **FIGS. 5 and 6**.

[**0042**] The injection mold **52** is a mold having a cavity **62** where to mold the small-diameter cylinder part **12** of the joint boot **10**, and is provided with an inner mold **68** having an air supply portion **66** for feeding air into a parison **64** and an outer mold **70** surrounding the inner mold **68**, thus forming the cavity **62** between the inner mold **68** and the outer mold **70**. The cavity **62** opens at a top surface of the injection mold **52**, namely at the underside so that this opening part can be superposed on the orifice **60** of the extruder die **50**, whereby the melted resin **61** discharged from the orifice **60** can be injected into the cavity **62**. The injection mold **52** also acts as a drawing member for drawing the parison **64**, which is a cylindrical melted resin discharged out of the extruder die **50**, out upwardly.

[**0043**] The blow mold **54** is a lateral splitting type of mold for blow molding the bellows part **16** and the large-diameter cylinder part **14** of the joint boot **10** from the parison **64**.

[**0044**] As indicated in **FIG. 5**, the injection mold **52** in this embodiment has the cavity **62** for molding the small-diameter cylinder part **12** including the cutout portion **24**. More specifically, the opening surface of the cavity **62** is set so as to be located at the vertical area **26** of the cutout portion **24**.

[**0045**] In conducting an injection blow molding by use of this molding assembly, first, as shown in **FIG. 8**A, the injection mold **52** is matched with the top surface of the extruder die **50** to inject the melted resin from the extruder die **50** into the cavity of the injection mold **52**. At that time, by combining the extruder die **50** and the injection mold **52** together as shown in FIGS. **4** to **6**, the core **58** of the extruder die **50** is moved downwardly thereby to open the orifice **60** at the top surface and the melted resin **61** is injected into the cavity **62**. Further, at that time, an outer peripheral edge **72** of the orifice **60** of the extruder die **50** abuts on an outer peripheral edge **74** of the opening of the cavity **62** of the injection mold **52** as illustrated in **FIG. 5** and **FIG. 6**, whereby a leakage of the melted resin **61** outside is precluded.

[**0046**] After injection molding, the injection mold **52** is moved axially, namely upwardly while adjusting the delivery amount of the melted resin by moving the core **58** of the extruder die **50** up and down as shown in **FIG. 8B** to draw the parison **64** out.

[**0047**] The parison **64** is thus drawn out in a predetermined length, and then, the injection mold **52** is stopped, simultaneously with which the core **58** of the extruder die **50** is moved upwardly to close the orifice **60** at the top surface. The blow mold **54** is set between the extruder die **50** and the injection mold **52** and closed, as shown in **FIG. 8**C, and air is admitted from the air supply portion **66** of the injection mold **52** into the parison **64** to conduct blow molding.

[**0048**] After blow molding, as shown in **FIG. 8**D, the resulting molding product is demolded and its bottom section **76** is cut off thereby to yield the joint boot made of resin.

[**0049**] In accordance with this embodiment, because the boundary X of the injection molding section and the blow

molding section is set not within the recess **20** for fixation of the small-diameter cylinder part **12**, but rather on the bellows part **16** side, the diameter of the outer peripheral edge **74** at the opening of the cavity **62** at the top surface of the injection mold **52** is nearly the same as the diameter of the outer peripheral edge **72** of the orifice **60** of the extruder die **50**, and accordingly, formed larger than in the conventional case. Consequently, even if the residual resin **76** clings to the tapered surface **58***a* at the top edge of the core **58** of the extruder die **50** as illustrated in **FIG. 6**, in mating the injection mold **52** with the extruder die **50**, the outer peripheral edge **74** at the top surface of the die is difficult to catch the residual resin **76**. Because of that, the residual resin **76** clinging to the core **58** at its top edge, as shown in **FIGS. 4 and 5**, is accommodated in the space inside the cutout portion **24** in the cavity **62** of the injection mold **52**, with the result that it is not likely for the residual resin **76** to be pinched between the extruder die **50** and the injection mold **52**. The production of any burr at the boundary X of the injection molding section and the blow molding section is therefore suppressed. The residual resin **76** is integrated by the melted resin **61** subsequently injected in the cavity **62** to form the small-diameter cylinder part **12**.

[**0050**] Further in this embodiment, due to the fact that the cutout portion **24** is provided in the recess **20** for fixation and the boundary X of the injection molding section and the blow molding section is set in the cutout portion **24**, the length of the interface **78** between the injection molding section and the blow molding section, in the sectional configuration passing through the center line L as shown in **FIG. 3**, is made shorter on the external surface side of the boot by a magnitude corresponding to the depth of the cutout portion **24** as compared with the case where the cutout portion **24** is not formed. Consequently, in blow molding when the uncured melted resin **61** is cured by blowing of air, while moving along the aforementioned interface **78** outwardly, to be united to the injection molding section as shown in **FIG. 7**, it is possible to make the moving distance shorter. The interface **78** on the external surface side of the boot is united more slowly than on the internal surface side, so that it is liable to be lower in adhesiveness. However in this embodiment, because the interface **78** on the external surface side is shortened by the cutout portion **24**, it is possible to suppress a bad adhesion of the injection molding section to the blow molding section to restrain the occurrence of cracking from the external surface side of the boot, thereby enhancing the durability.

[**0051**] Again according to this embodiment, due to the fact that the shoulder portion **20***c* on the bellows part side of the recess **20** for fixation is cut out to provide the cutout portion **24**, the volume of the shoulder portion **20***c* is reduced. Therefore even in cases where repeated deformation is imparted on the first crest portion **16***a* of the bellows part **16** in the directions of an arrow Y, a stress imposed on the corner portion **20***a* of the recess **20** for fixation on the bellows part side is relaxed. As a consequence, even if rotated in the bending deformation state at a wide angle as illustrated in **FIG. 3**, the joint boot **10** is hard to cause cracking in the recess **20** for fixation at the small-diameter cylinder part **12**, and accordingly, has a superior durability.

[**0052**] With a view toward corroborating such a durability effect, a simulation was conducted on the joint boot in this embodiment shown in **FIG. 1** and the conventional joint boot illustrated in **FIG. 9** regarding stress distributions under conditions of deformation at joint angles (an angle made by the center line of the housing part and the center line of the shaft) of 43 degrees and 35 degrees by using analysis based on finite element method (hereinafter referred to as "FEM analysis").

[**0053**] The results obtained are given in Table 1 below. In the present embodiment wherein the recess for fixation of the small-diameter cylinder part has the cutout portion at the shoulder portion on the bellows part side, vibrational amplitude values of a maximum stress imposed on the edge on the bellows part side of the recess (vibrational amplitudes of a main stress acting in the direction along a cross-section R of the edge on the bellows part side) were diminished as compared with those of the conventional example devoid of the cutout portion.

[**0054**] Furthermore, the joint boot in the embodiment shown in **FIG. 1** and the conventional joint boot shown in **FIG. 9** were molded by use of a thermoplastic elastomer as a boot molding material, and both joint boots made of resin thus obtained were subjected to durability test. The durability test was performed with the joint boots made of resin incorporated in a constant velocity joint, at ambient temperature of 100° C., at a joint angle of 43 degrees and at a revolution number of 500 rpm.

[**0055**] The results obtained are given in Table 1 below. With the conventional joint boot, a breakage occurred from the corner portion, on the bellows part side, of the recess for fixation of the small-diameter cylinder part in 25 hours after starting of the test. In contrast, with the joint boot in the embodiment, the occurrence of breakage elongated up to 40 hours after starting of the test. Thus the targeted value of 30 hours can be achieved and the breakage was seen in a root portion of the bellows part, with no breakage at the small-diameter cylinder part.

TABLE 1

		Joint Boot in the Embodiment	Conventional Joint Boot
Sectional Configuration		FIG. 1 (with cutout portion	FIG. 8 (without cutout portion
FEM Analysis Results (kg/mm^2)	Joint angle = 43°	1.9	2.4
	Joint angle = 35°	1.4	1.6
Durability Test	Time taken until breakage	40 hours	25 hours
	Place of Breakage	Bellows part	Small-diameter cylinder part
	Achievement of Target 30 hr.	Acceptance	Rejection

[0056] In the foregoing embodiment, one example was thus described wherein the cutout portion **24** is provided in the recess **20** for fixation of the small-diameter cylinder part **12** on the bellows part side **20***c*, but it is also possible to provide a similar cutout portion in the recess **18** for fixation of the large-diameter cylinder part **14**, or similar cutout portions in both the recesses **18**, **20** for fixation of the small-diameter and the large-diameter cylinder parts **12**, **14**, instead.

1. A joint boot made of resin comprising a first cylinder part, a second cylinder part, and a bellows part integrally linking both and molded by injection blow molding, with said first cylinder part made into an injection molding section,

wherein said first cylinder part is provided at its outer periphery with a recess for fixation, and a boundary at an outer periphery of the boot between the injection molding section and a blow molding section is set on a bellows part side away from said recess for fixation.

2. The joint boot made of resin as set forth in claim 1, wherein a shoulder portion of said recess for fixation on the bellows part side is provided with a cutout portion and said boundary between the injection molding section and the blow molding section is set in said cutout portion.

3. The joint boot made of resin as set forth in claim 2, wherein said cutout portion includes a vertical area falling radially inwardly from an outer periphery of the first cylinder part and a slope area extending from an inboard end of the vertical area to a wall surface of said recess for fixation.

4. The joint boot made of resin as set forth in claim 3, wherein the said slope area is of a curved surface.

5. The joint boot made of resin as set forth in claim 1, wherein said first cylinder part is a small-diameter cylinder part and said second cylinder part is a large-diameter cylinder part coaxially disposed to the small-diameter cylinder part.

6. A joint boot made of resin comprising a first cylinder part, a second cylinder part, and a bellows part integrally linking both,

wherein said first cylinder part is provided at its outer periphery with a recess for fixation and a shoulder portion of said recess for fixation on the bellows part side is provided with a cutout portion.

7. The joint boot made of resin as set forth in claim 6, wherein said first cylinder part is a small-diameter cylinder part and the second cylinder part is a large-diameter cylinder part coaxially disposed to the small-diameter cylinder part.

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