(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 614 780 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
13.06.2012 Bulletin 2012/24

(51) Int Cl.:
D01H 5/62 *(2006.01)*

(21) Application number: **05007207.3**

(22) Date of filing: **01.04.2005**

(54) **Cleaning apparatus for draft roller**

Reinigungsvorrichtung für Streckwalze

Dispositif de nettoyage pour rouleau d'étirage

(84) Designated Contracting States:
CH DE LI TR

(30) Priority: **09.07.2004 JP 2004202618**

(43) Date of publication of application:
11.01.2006 Bulletin 2006/02

(73) Proprietor: **MURATA KIKAI KABUSHIKI KAISHA**
Kyoto (JP)

(72) Inventor: **Imamura, Hisakatsu**
Uji-shi
Kyoto (JP)

(74) Representative: **Gritschneder, Martin et al**
Abitz & Partner
Patentanwälte
Postfach 86 01 09
81628 München (DE)

(56) References cited:
EP-A- 0 437 823
DE-A- 2 022 196
GB-A- 476 514
GB-A- 1 302 007
US-A- 3 101 504

EP 1 614 780 B1

Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The invention relates to a cleaning apparatus for a draft roller in a draft apparatus.

PRIOR ART

[0002] Draft rollers for a draft apparatus in a spinning machine, a roving machine or the like are constituted of top rollers on the upper side and bottom rollers on the lower side. Since a sliver is drafted between the top rollers and the bottom rollers, honey dew in a case where a raw material of a sliver is cotton, an oil solution in a case where a raw material of sliver is chemical fibers or other material such as cotton fly is attached on the outer surface of a draft roller. Hence, a cleaning apparatus for removing such attachment regularly and cleaning the roller is equipped to the draft roller. As conventional cleaning apparatuses, there have been available a construction in which a belt constituted of a flexible member (a fin) is brought into contact with a draft roller to thereby slap down cotton fly or the like (see Patent Document 1); and a construction in which a rubber pat is brought into contact with the outer surface of a draft roller to scratch off cotton fly or the like (see Patent Document 2).

Patent Document 1: Japanese Utility Model Application Laid-open No. 6-10376
Patent Document 2: Japanese Utility Model Registration No. 2605843

[0003] Since a honey dew, oil solution or the like, however, has a viscosity and strongly attached on the outer surface of a roller, a cleaning apparatus using a belt or a rubber pat, in which the belt or the rubber pat has a weak scratching force so as to contact a roller surface and rub it along tangent direction and cannot remove with certainty for cleaning. In the apparatus using the rubber pat, since the pat is regularly moved away from a roller to remove the attachment down, there has remained a problem that the attachment on the roller cannot be removed when the pat moves away.

[0004] Patent Document 3, US-A-3101 504, which is considered the closest prior art, discloses a cleaning device for yarn carrying rotary cylinders of textile machines, comprising a scraper member having a sharp end edge in contact with the outer edge of a draft roller.

SUMMARY OF THE INVENTION

[0005] The invention as claimed in Claim 1 solves the problem of how to provide an efficient cleaning apparatus for a draft roller, that can be easily maintained.

[0006] The cleaning apparatus for a draft roller is equipped with a scraper member extending in the axial direction of the draft roller, and having a sharp end edge in contact with the outer surface of the draft roller and the sharp end edge of the scraper member is brought into contact with the outer surface of the draft roller in parallel to the central axis line thereof.

[0007] Press means for pressing the scraper member against the outer surface of the draft roller in press contact therewith are provided to the cleaning apparatus.

[0008] The cleaning apparatus is equipped with a holder member for holding the scraper member, the holder member is provided to bearing houses of the draft roller so as to be freely mounted or dismounted, and the bearing houses position the holder member.

[0009] The bearing houses have respective holder support holes for inserting or drawing out the holding member so as to be freely mounted or dismounted, is the scraper member held so that it can freely protrude from or retreat into the holder member, has tapered portions on both ends thereof in a way such that a width increases toward the center of the holder member in a direction of inserting or drawing out of the holder member, wherein when the holder member is inserted or drawn out, a tapered portion is brought into contact with the holder support hole and the scraper member sinks in the holder member.

[0010] It is preferable that the scraper member is made of synthetic resin and lower in hardness than the outer surface of the draft roller.

[0011] Since a cleaning apparatus of the invention is in contact with the draft roller so that the sharp end edge of the scraper member is in parallel to the central axis line of the draft roller, honey dew, oil solution or the like attached on the outer surface of the roller is scratched off by the sharp end edge with certainty as the roller rotates.

[0012] The honey dew, oil solution or the like can be strongly scratched off under pressure from the press member. Even if the sharp end edge of the scraper member is worn more or less as time elapses, the press member can maintain a prescribed press force against the roller; therefore, unevenness in cleaning can be minimized.

[0013] The holder member holding the scraper member or the like can be dismounted and maintenance such as adjustment of a roller gauge or exchange of scraper members can be conducted with ease by providing the holding member to the bearing house of the draft roller so as to be freely mounted or dismounted.

[0014] The scraper member is made of synthetic resin to thereby enable a honey dew or oil solution to be scratched off with certainty with a hard characteristic of a synthetic resin. Since such a scraper is excellent in productivity and cost and softer than the metal draft roller, no damage occurs on the outer surface of the roller in a press contact with the scraper.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a front view of a spinning machine equipped with a cleaning apparatus for a draft roller concerning the invention.

Fig. 2 is a side view showing a main section of a draft apparatus equipped with a cleaning apparatus.

Fig. 3 is a perspective, enlarged view of a section in the vicinity of a back bottom roller.

Fig. 4 is a partially sectional view in a direction B of Fig. 2.

Fig. 5 is a sectional view taken along a line A-A of Fig. 4.

Figs. 6(a) and 6(b) are partially sectional views for describing a procedure for mounting or dismounting a holder member.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Hereinafter, a cleaning apparatus for a draft roller concerning the present invention will be concretely described with referent to the drawing.

[0017] As shown in Fig. 1, a spinning machine of the embodiment has many spinning units 15, 15, ··· in parallel between a motor box 16 and a dust box 17. A spinning unit 15 includes a draft apparatus 10 having a back roller 1, a third roller 2, a second roller 3 and a front roller 4 therein and a sliver S drawn out from a sliver cans (not shown) is drafted. An air spinning section 11 is provided below a draft apparatus 10 and a sliver S sent out from a draft apparatus 10 is spun by the air spinning section 11. The spun sliver S becomes yarn Y and the yarn Y is drawn out by a yarn feed roller 12 and taken up on a take-up package 13 while being traversed.

[0018] Back rollers 1 and third rollers 2 are, as shown in Fig. 2, constituted of top rollers 1a and 2a disposed in upper positions and bottom rollers 1 b and 2b disposed in lower positions, and a sliver S is caused to pass through between the top rollers 1 a and 2a and the bottom rollers 1 band 2b and drafted. When a sliver S is drafted, oil solution or honey dew, or cotton fly attaches to the outer surfaces of the rollers of a draft apparatus. Hence, the cleaning apparatuses 5 and 5 are equipped to the lower sides of the back roller 1 and the third roller 2 for removing attachment on the bottom rollers 1 b and 2b.

[0019] Cleaning apparatuses 5 and 5 each, as shown in Fig. 3 to 6, provide a scraper member 50, and the scraper member 50 is held by a holder member 51. A sharp end edge 50a is formed at the distal end of the scraper member 50, and the sharp end edge 50a is disposed so as to be in contact with the outer surface of each of the bottom rollers 1 band 2b. The scraper members 50 are pressed against the central axis lines 1 c and 2c of respective bottom rollers 1 band 2b by a press member 52 provided in the holder member 51, and the sharp end edge 50a of the scraper member 50 is in press contact with the outer surface of respective the bottom rollers 1b and 2b along the entire length.

[0020] Since the outer surface of each of the bottom rollers 1 b and 2b is constantly in press contact with the sharp end edge 50a of the scraper member 50, the sharp end edge 50a scratches off attachment such as honey dew attached on the outer surface of each of the bottom rollers 1b and 2b during rotation of the bottom rollers 1 b and 2b. A suction member 55 is installed below the scraper member 50 and cotton fly or the like scratched off can be sucked and removed by a suction action of the suction member 55 with certainty. The suction member 55 is constructed so as to obtain a suction force by being connected to the dust box 17 or the like of the spinning machine.

[0021] The back bottom roller 1 b is, as shown in Fig. 3, provided with shafts 1 d and 1 d on both sides thereof. Bearing houses 20 and 20 are disposed on both sides of the back bottom roller 1b, and roller support holes 20b and 20b provided in the top portions of the bearing houses 20 and 20 support the shafts 1 d and 1 d and rotatably support the back bottom roller 1 b. Holder support holes 20a and 20a are provided in the bottom portions of the bearing houses 20, and a holder member 51 is inserted through and supported by the holder support holes 20a and 20a.

[0022] The holder member 51 and the scraper member 50 are provided so as to extend in the axial direction of the back bottom roller 1b, and the sharp end edge 50a disposed in the axial direction of the scraper member 50 is in contact with the outer surface of a third bottom roller 2b. As shown in Fig. 4, the holder member 51 provides a housing groove 51 a in the axial direction. The press member 52 constituted of a leaf spring or the like is housed in the housing groove 51 a and the scraper member 50 is disposed on the press member 52. The press member 52 presses the scraper member 50 against the back bottom roller 1b, thereby the sharp end edge 50a of the scraper member 50 is in press contact with the outer surface of the bottom roller 1 b. For example, the scraper member 50 is made of a hard synthetic resin less in deformation and adopted so as to be lower in hardness than the roller, which is an object to be cleaned. With such a construction adopted, the outer surfaces of the metal bottom rollers 1 b and 2b are not damaged physically during cleaning.

[0023] In order to improve a scratching force on the outer surface of a roller, the sharp end edge 50a of the scraper member 50 is designed so as to be constantly aligned with the central axis line 1 c of the back bottom roller 1b. That is, each of the holder support hole 20a and 20a has a sectional shape of almost an ellipse and the holder member 51 is formed so as to have a sectional shape of a polygon that can be inserted into the holder support holes 20a and 20a, and thereby, the holder member 51 inserted through the holder support holes 20a and 20a does not rotate in company with rotation of the back bottom roller 1 b and constantly assumes a position so

that the sharp end edge 50a is in parallel contact with the central axis line 1c.

[0024] In a case of Patent Document 2, conventionally, there has been a problem that a rubber pat or a belt is an obstacle in adjustment of a roller gauge. Therefore, the holder member 51 is constructed so as to be freely mounted to or dismounted from the bearing houses 20 and 20, whereby operations is easy in maintenance such as exchange of scraper members 50 or adjustment of a roller gauge. Figs. 6(a) and 6(b) are partially sectional view for describing a procedure for mounting or dismounting a holder member. As shown in Fig. 4, the scraper member 50 is constructed so as to freely protrude from or retreat into the housing groove 51 a of the holder member 51 by the press member 52. Tapered sections 50b and 50b are formed on both sides of the scraper member 50. When the holder member 51 is, as shown in Fig. 6 (a), dismounted from the bearing houses 20 and 20, the holder member 51 is at first pulled in the axial direction (the direction of inserting or drawing out) C to thereby cause a tapered portion 50b of the scraper member 50 to be in contact with a hold support hole 20a. Then, the holder member 51 is further pulled in the axial direction (the direction of inserting or drawing out) C, whereby the scraper member 50 is pressed downwardly against a press force of the press member 52 and housed and sinks in the housing groove 51 a, and in this state, the holder member 51 is drawn out through the holder support hole 20a and can be dismounted. That is, tapered portions 50b and 50b are formed on both ends of the scraper member 50 in a way such that a width increases toward the center of the holder member 51 in a direction of inserting or drawing out of the holder member, and the holder member 51 can be inserted into or drawn out from the holder support holes 20a smoothly on both sides of the axial direction.

[0025] A cleaning apparatus concerning the invention can be installed in various kinds of textile machines each equipped with a draft apparatus including a spinning machine. The cleaning apparatus can also be applied to top rollers or the like in a draft roller.

Claims

1. A cleaning apparatus (5) for a draft roller (1 b, 2b), comprising:

   a scraper member (50) extending in the axial direction of the draft roller (1b, 2b) and having a sharp end edge (50a) in contact with the outer surface of the draft roller (1b, 2b), the sharp end edge (50a) of the scraper member (50) being brought into contact with the outer surface of the draft roller (1b, 2b) in parallel to the central axis line (1c, 2c) thereof,
   press means (52) for pressing said scraper member (50) against the outer surface of the draft roller (1b, 2b) in press contact therewith,
   a holder member (51) for holding the scraper member (50), and
   the holder member (51) being supported at its ends by bearing houses (20), which position the holder member (51)
   characterized in that
   the bearing houses (20) have respective holder support holes (20a) for inserting or drawing out the holding member (51) so as to be freely mounted or dismounted, and
   the scraper member (50) is held so that it can freely protrude from or retreat into the holder member (51), and has tapered portions (50b) on both ends thereof so that when the holder member (51) is inserted or drawn out, a tapered portion (50b) is brought into contact with the holder support hole (20a) and the scraper member (50) sinks in the holder member (51), thereby allowing an easy mounting or dismounting of the holder member (51).

Patentansprüche

1. Reinigungsvorrichtung (5) für eine Streckwalze (1b, 2b), umfassend:

   ein Schaberelement (50), das sich in der Achsenrichtung der Streckwalze (1b, 2b) erstreckt und eine scharfe Endkante (50a) in Berührung mit der Außenoberfläche der Streckwalze (1b, 2b) aufweist, wobei die scharfe Endkante (50a) des Schaberelements (50) in Berührung mit der Außenoberfläche der Streckwalze (1b, 2b) parallel zu ihrer mittigen Achsenlinie (1c, 2c) gebracht ist,
   eine Presseinrichtung (52) zum Pressen des Schaberelements (50) gegen die Außenoberfläche der Streckwalze (1b, 2b) in Pressberührung mit ihr,
   ein Halterelement (51), um das Schaberelement (50) zu halten, und
   wobei das Halterelement (51) an seinen Enden durch Lagergehäuse (20) getragen wird, die das Halterelement (51) positionieren,
   dadurch gekennzeichnet, dass
   die Lagergehäuse (20) jeweilige Haltertraglöcher (20a) aufweisen, um das Halteelement (51) einzuführen oder herauszuziehen, so dass es sich ungehindert montieren oder demontieren lässt, und
   das Schaberelement (50) so gehalten wird, dass es ungehindert aus dem Halterelement (51) vorstehen oder sich darin zurückziehen kann, und schräg verlaufende Teile (50b) auf seinen beiden Enden aufweist, so dass, wenn das Halterelement (51) eingeführt oder herausgezogen

wird, ein schräg verlaufender Teil (50b) in Berührung mit dem Haltertragloch (20a) gebracht wird und das Schaberelement (50) in das Halterelement (51) einsinkt, wodurch eine leichte Montage oder Demontage des Halterelements (51) ermöglicht wird.

Revendications

1. Appareil de nettoyage (5) pour rouleau d'étirage (1 b, 2b), comprenant :

un élément racloir (50) s'étendant dans le sens axial du rouleau d'étirage (1 b, 2b) et ayant un bord extrême aiguisé (50a) en contact avec la surface externe du rouleau d'étirage (1 b, 2b), le bord extrême aiguisé (50a) de l'élément racloir (50) étant amené en contact avec la surface externe du rouleau d'étirage (1b, 2b) en parallèle avec la ligne d'axe central (1c, 2c) de celui-ci,
un moyen de pression (52) pour presser ledit élément racloir (50) contre la surface externe du rouleau d'étirage (1 b, 2b) en un contact de pression avec celui-ci,
un élément de maintien (51) pour maintenir l'élément racloir (50), et
l'élément de maintien (51) étant supporté à ses extrémités par des paliers (20) qui positionnent l'élément de maintien (51)
caractérisé en ce que
les paliers (20) comportent des trous de support d'élément de maintien (20a) respectifs pour insérer ou extraire l'élément de maintien (51) de façon à le monter ou démonter librement, et
l'élément racloir (50) est supporté de façon à pouvoir saillir librement de l'élément de maintien (51) ou se rétracter librement dans celui-ci, et comporte des parties coniques (50b) sur ses deux extrémités de telle sorte que lorsque l'élément de maintien (51) est inséré ou extrait, une partie conique (50b) soit mise en contact avec le trou de support d'élément de maintien (20a) et l'élément racloir (50) s'enfonce dans l'élément de maintien (51), permettant ainsi un montage ou démontage aisé de l'élément de maintien (51).

Fig. 1

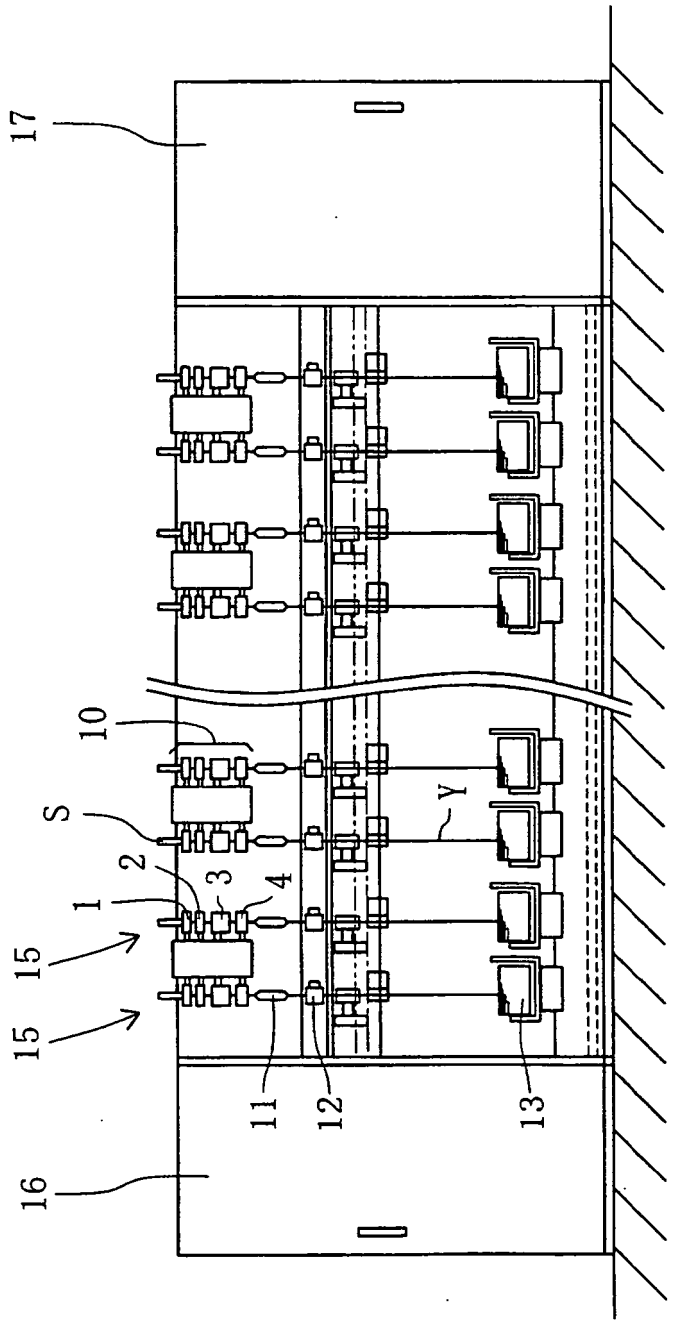


Fig. 2

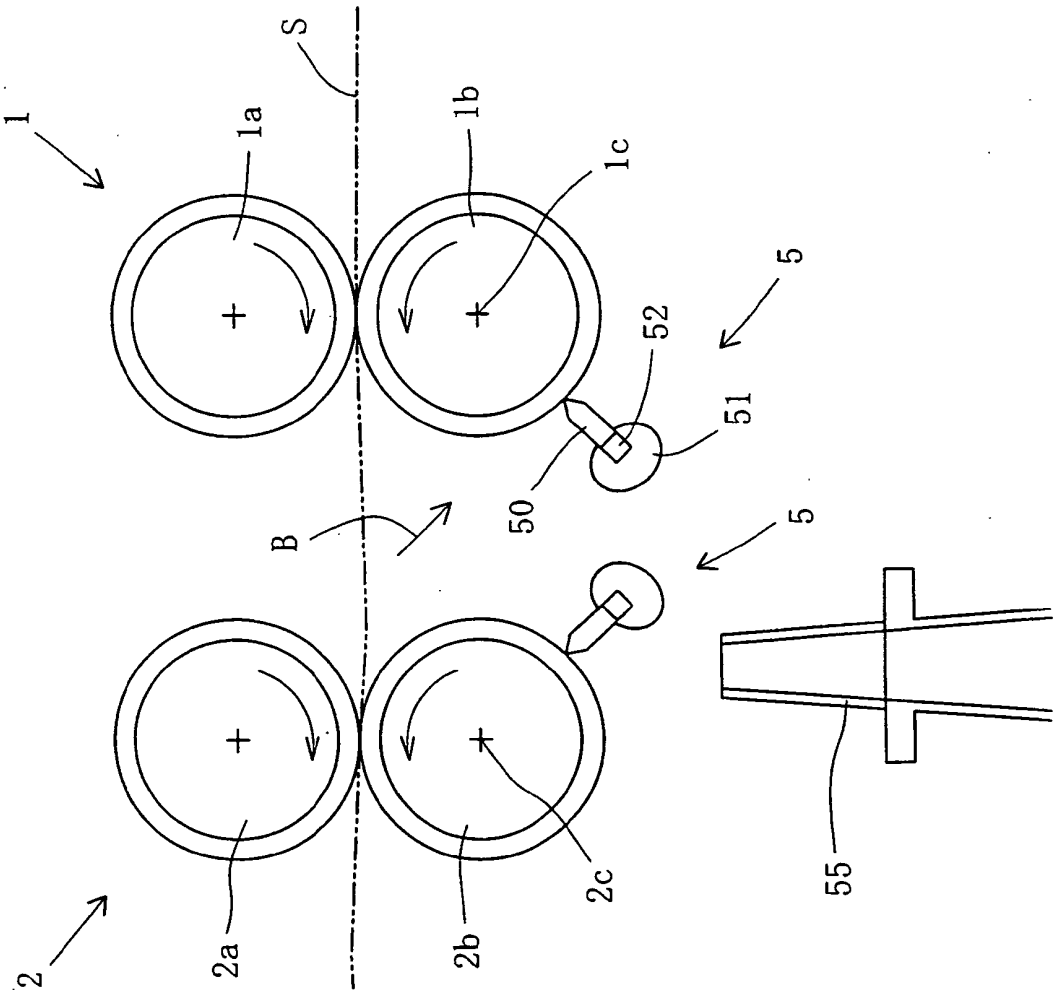


Fig. 3

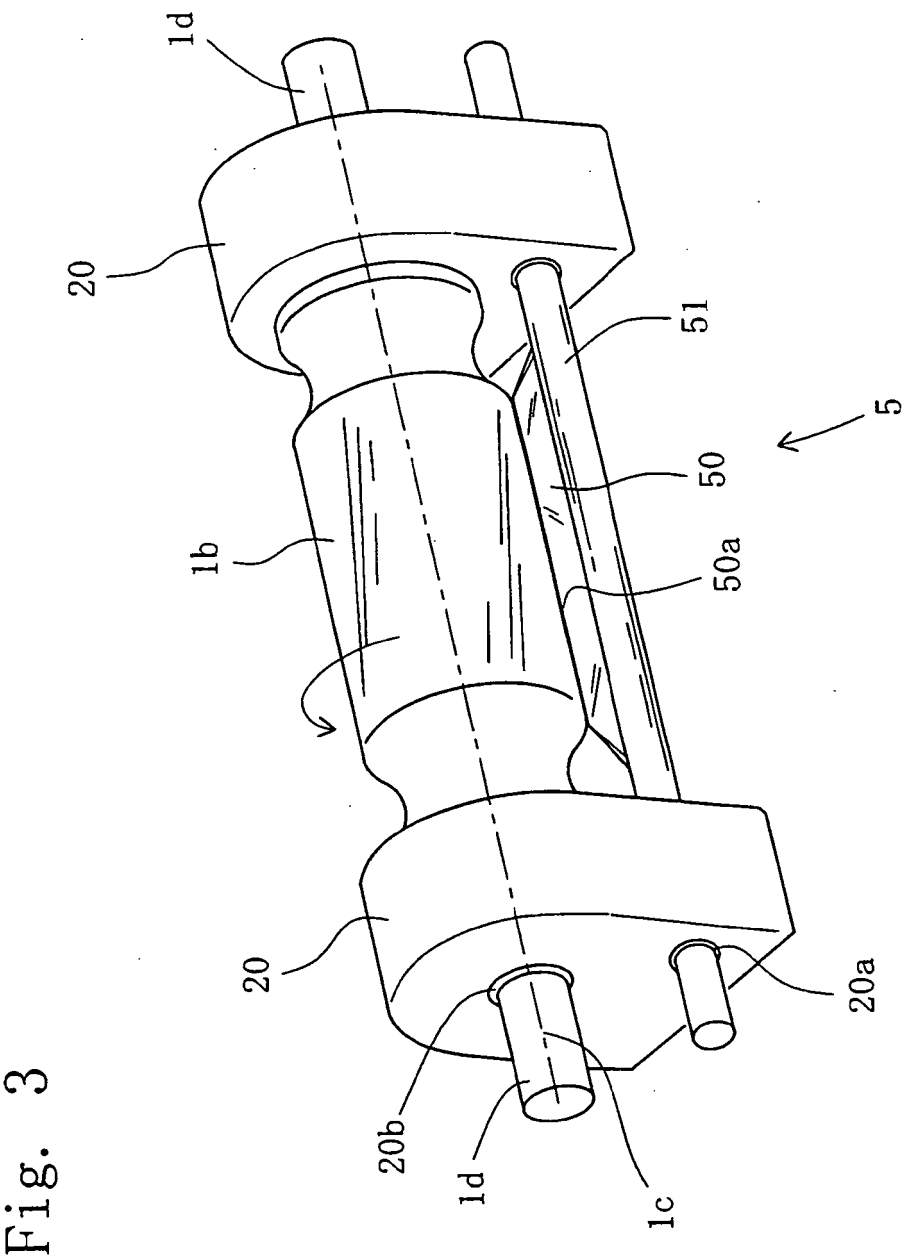


Fig. 4

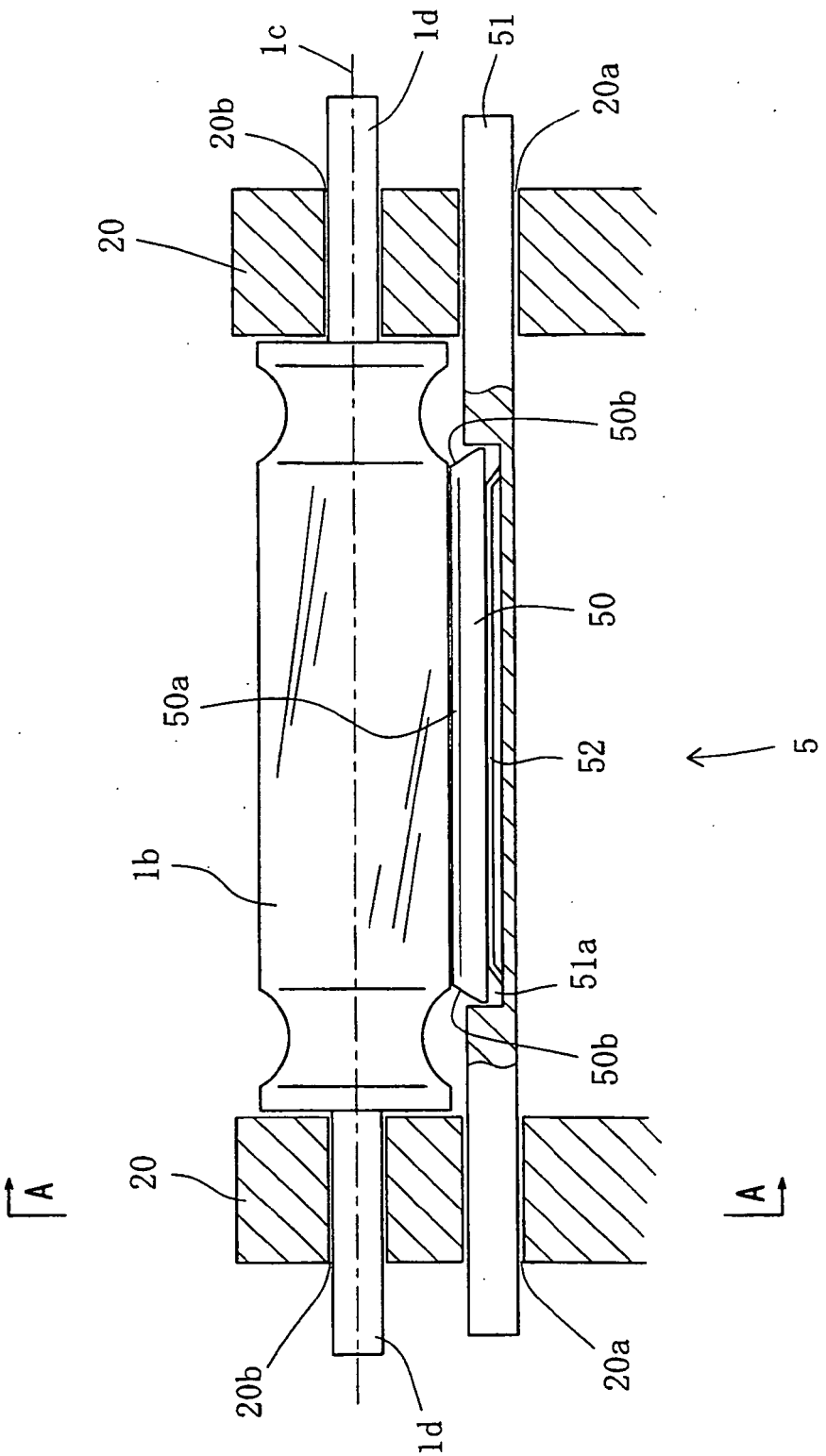


Fig. 5

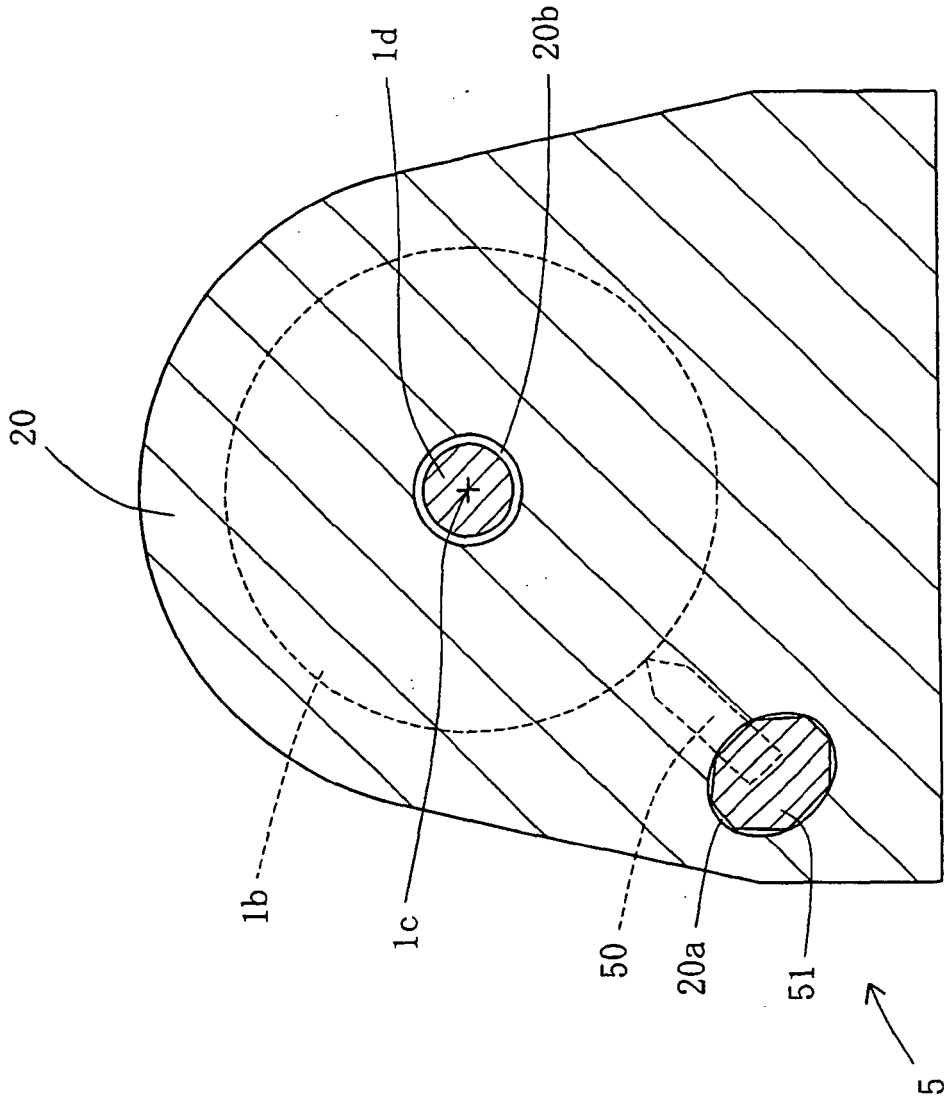
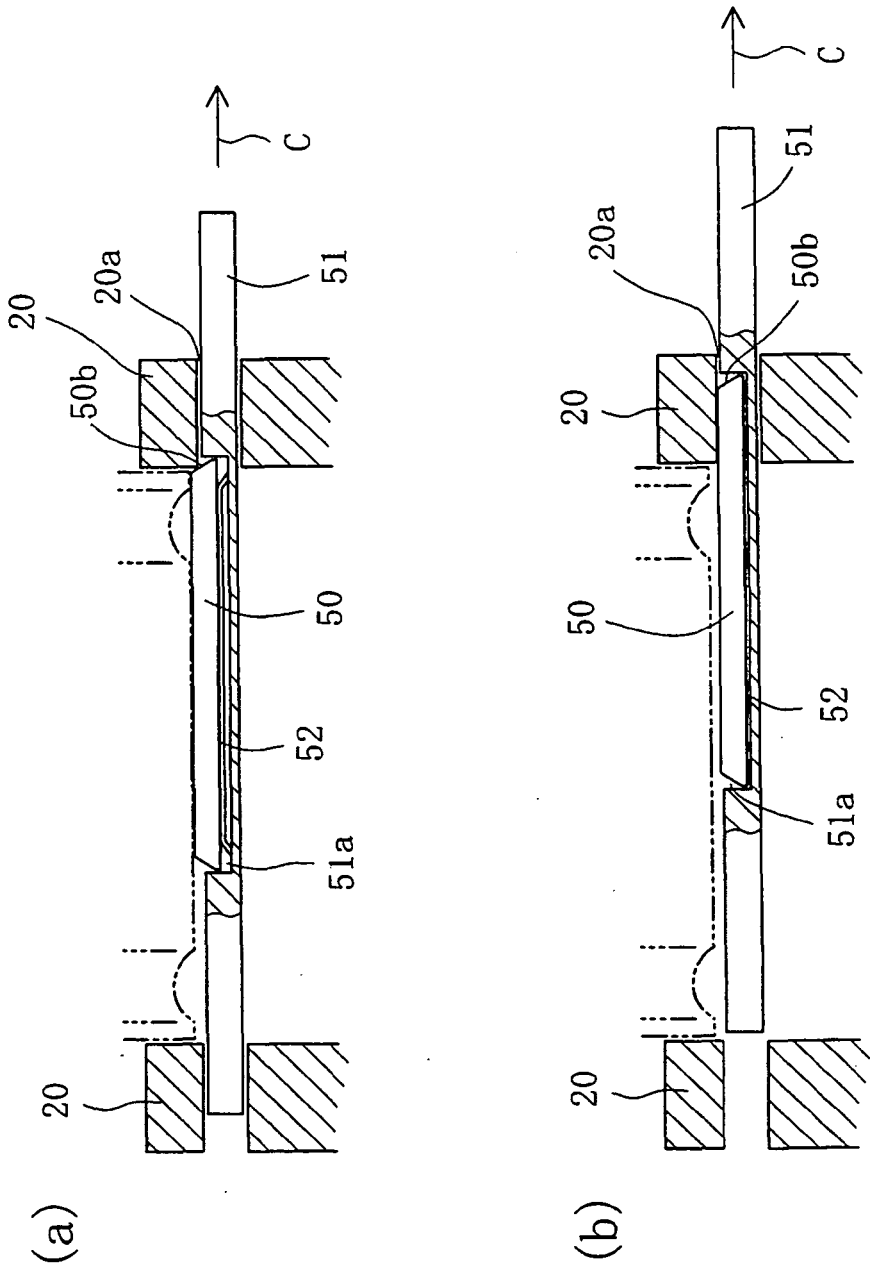


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 6010376 A **[0002]**
- JP 2605843 B **[0002]**
- US 3101504 A **[0004]**