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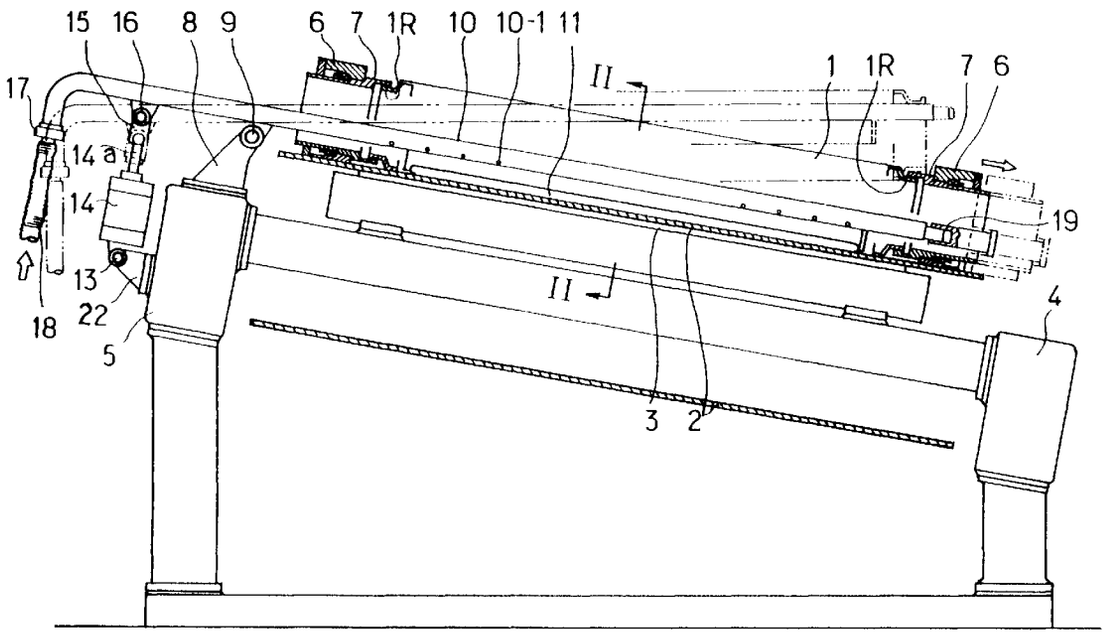
(54) Rotary screen textile printing machine

(57) Disclosed is a rotary screen textile printing machine comprising a rotary screen (1) and a bar (10) extending through the substantially entire length of the rotary screen (1), characterized in that: bearings (6) supporting the opposite ends of the rotary screen (1) are attached to a support (60) in such a manner that one of the bearings (6) is movable relative to the other in the width direction of the textile printing machine; the rotary screen (1) is detachably supported by the bearings (6); the end of the bar (10) extending into the rotary screen is detachably supported by a support member (19) mounted on the movable bearing (6); and the bar (10) is supported on the textile printing machine (5) at a point outside of the rotary screen (1) in a vertically rotatable manner.

F I G. 1



EP 0 863 000 A1

Description

FIELD OF THE INVENTION

The present invention relates to a rotary screen textile printing machine.

DESCRIPTION OF PRIOR ART

Rotary screen textile printing machines have a bar extending through a rotary screen, which bar is provided with a stopper for positioning a roller squeegee at a predetermined location within the rotary screen.

Conventionally, such a bar extends from a bearing on one end side of the rotary screen and passes through another bearing on the other end side (see Fig. **7**). This bar is substantially connected to the bearings in a detachable manner. In Fig. **7**, the reference numeral **1** indicates a rotary screen, **4** and **5** indicate machine frames of a textile printing machine, **6** indicates a bearing, **7** indicates a base, **10** indicates a bar, and **C** indicates a connecting member for the bar **10**. The connecting member **C** is attached to the bearing **6** with a bolt. The bearings **6, 6** are connected to a support **60**.

However, there are the following problems in such a conventional technique of connecting a bar at its opposite ends.

Prior to replacing the rotary screen **1**, it is necessary to withdraw the bar **10** in a left or right direction and insert the bar into the rotary screen after the replacement. For each replacement, the bar has to be disconnected from the bearings at its opposite ends, and then has to be reconnected after the replacement.

The bar is usually about 2.5 - 4.0 m long and weighs about 10 - 18 kg. Accordingly, withdrawing/inserting of the bar is really laborious. Furthermore, to prevent the damage of the rotary screen, it is necessary to withdraw/insert the bar so carefully as not to hit it against the screen. For this reason, two persons in total have to attend on the opposite sides of the printing machine, i.e., on the operating side and the non-operating side of the printing machine in order to withdraw/insert the bar. This operation requires a lot of labor and is not an easy task to conduct.

SUMMARY OF THE INVENTION

The object of the present invention is to enable even only one person to replace a rotary screen of a rotary screen textile printing machine.

The present invention relates to a rotary screen textile printing machine constructed as follows.

A rotary screen textile printing machine, characterized in that: bearings supporting the opposite ends of a rotary screen are attached to a support in such a manner that one of the bearings is movable relative to the other in the width direction of the textile printing machine; the rotary screen is detachably supported by the bearings; one end of a bar extending into the rotary screen is detachably supported by a support member attached to the movable bearing; the other end of the bar extends out of the rotary screen; and the bar is supported on the machine frames of the textile printing machine at a point outside of the rotary screen in a vertically rotatable manner.

Hereinafter, the term width direction of the printing machine " shall mean the width direction of a textile to be printed on the printing machine. This applies to the appended claims and the description below.

Preferably, the opposite ends of the rotary screen form end rings of tapered shape. The reason for that will be later described.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. **1** is a sectional view taken along the axis of a rotary screen, illustrating an example of a textile-printing machine according to the present invention;
Fig. **2** is a cross sectional view taken along Line II-II of Fig. **1**;
Fig. **3** is a plan view of bearings and supports in the rotary screen textile printing machine shown in Fig. **1**;
Fig. **4** is a cross sectional view taken along Line IV-IV of Fig. **3**;
Fig. **5** is a perspective view of an end ring formed at the end of the rotary screen;
Fig. **6** is a perspective view of a base; and
Fig. **7** is a plan view showing that the bar extending through the rotary screen is connected at its opposite ends in a conventional rotary screen textile printing machine.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will now be described with reference to the accompanying drawings.

The textile-printing machine of the present invention comprises a plurality of rotary screens **1** spaced in parallel by a predetermined distance or a single rotary screen **1**, an endless belt **2** for transporting a textile to be printed, a textile-printing table **3**, a drive roller (not shown) for driving the endless belt **2** or the like mounted on machine frames **4** and **5** of a textile-printing machine. These components may be inclined in the width direction of the endless belt **2**, or may be horizontal relative to the width direction of the endless belt **2**.

Formed at the opposite ends of the rotary screen **1** are end rings **1R, 1R** of a smaller diameter than that of the rotary screen **1**. Bearings **6, 6** on the opposite sides of the rotary screen **1** are mounted on a support **60** in such a manner that one of the bearings is movable relative to the other, e.g., the right bearing in Fig. **1** is movable in the width direction of the textile printing machine

(i.e., a left or right direction of Fig. **1**). More specifically, one of the bearings **6, 6** is immovably attached to the support **60**, and the other bearing is supported by the support **60** slidably in the width direction of the textile printing machine. The slidable bearing **6** is guided along a guide rail **61**. The bearings **6**, **6** are supported by the support **60** in such a cantilevered manner that they project from the support **60** in the lengthwise direction of the belt **2**.

Bases **7**, **7** are supported within the bearings **6**, **6** rotatably about their axes. The end rings **1R, 1R** are detachably fitted in the bases **7**, **7**. Accordingly, the rotary screen **1** is detachably supported by the bearings **6**, **6**. Engaging members **71** are finned at the ends of the bases **7**, **7**. Likewise, engaging members **12** are finned at the ends of the end rings **1R**, **1R**. The engaging members **71** and **12** are formed in plurality, as illustrated in Figs. **5** and **6**. When the engaging members **71** and **12** on one side of the screen engage with each other, the engaging members **71** and **12** on the opposite side engage with each other.

When one of the bearings **6, 6** (the right bearing **6** in Fig. **1**) is pulled in the right direction of Fig. **1** by an air-cylinder (not shown) or the like, the rotary screen **1** is axially tensioned to become rigid. The thus-tensioned rotary screen **1** becomes integral with the bases **7, 7** and therefore can rotate therewith. The rotary screen **1** is rotated synchronously with the endless belt **2** as in conventional rotary screen printing machines.

A bar **10** extends through the substantially entire length of the rotary screen **1**. The front end of the bar **10**, i.e., the end extending into the rotary screen **1** terminates within the base **7** on the front end side of the bar **10** and is detachably supported by a support member **19** disposed at a predetermined location within the base **7**. The rear end of the bar **10** extends out of the rotary screen **1**. A slidable bearing is employed as the bearing **6** on the front end side of the bar **10**. The support member **19** is attached to a bracket **19a** on the bearing **6** on the front end side.

Further, a bracket **8** is provided on the machine frame **5**. The bar **10** is vertically rotatably supported via a pivot **9** at a point outside of the rotary screen **1**. At another point outside of the rotary screen **1**, the bar **10** is connected via a pivot **16** to a clevis **15** attached at the top end of a plunger **14a** of an air cylinder **14** which is provided on the frame **5**. At the opposite end of the plunger **14a** relative to the pivot **16**, the air cylinder **14** is connected to a bracket **22** via s pivot **13**.

The bar **10** is provided, via an attachment member **21**, with a stopper **20** for positioning a roller squeegee **11** at a predetermined location within the rotary screen **1**. The stopper **20** extends in parallel with the rotary screen **1**.

The bar **10** is of the hollow type having a number of holes **10-1** on its cylindrical surface and thus act as a member for supplying washing water into the rotary screen **1**. Connected via a coupler **17** to the start end of the hollow type bar is a washing water hose **18**.

It is shown in Fig. **1** with solid lines that the end rings **1R**, **1R** are fitted in the bases **7, 7**, that is, the rotary screen **1** is supported by the bearings **6, 6**.

To remove or disconnect the end rings **1R, 1R** from the bases **7, 7**, in other words, to detach or disconnect the rotary screen **1** from the bearings **6, 6**, the axial tension of the rotary screen **1** is released, and then the rotary screen **1** is manually rotated relative to the bases **7, 7**, so that the engaging members **12** and **71** are disengaged. Thereafter, the right bearing **6** in Fig. **1** is moved in the right direction of Fig. **1** relative to the rotary screen, and then the rotary screen **1** is moved in the right direction of Fig. **1** relative to the opposite base **7**, thereby achieving the detaching operation.

If the end rings **1R**, **1R** are disengaged from the bases **7**, **7**, the rotary screen **1** is disconnected from the bearings **6**, **6**.

The rotary screen **1**, having the end rings **1R, 1R** disconnected from the bases **7**, **7**, is connected again to the bearings **6**, **6** by the following steps of: i) fitting the end rings **1R**, **1R** in the bases **7**, **7** such that the engaging members **71** and **12** do not face each other; and ii) rotating the rotary screen **1** about its axis relative to the bases **7**, **7** so as to engage the engaging members **71** and **12** with each other.

When the bar **10** is upwardly rotated by the air cylinder **14** with a pivot **9** being a point of support, the front end of the bar **10** contact the end ring **1R** on the front end side. When the bar **10** is further rotated upwardly, the rotary screen **1**, which is disconnected from the bearings **6**, **6**, follows the upward rotation of the bar **10**.

When the rotary screen **1** is upwardly rotated to a predetermined level, the air cylinder **14** stops so that the rotary screen **1** can be withdrawn in the right direction of Fig. **1** relative to the bar **10**. In this case, since the rotary screen **1** has followed the rotation of the bar **10**, i.e., has been raised to the said level, even only one person can withdraw the rotary screen **1** using the bar **10** as a guide or a jig.

To mount the rotary screen **1** on the machine frames **4** and **5** again, too, even only one person can fit the rotary screen **1** to the bar **10** using the bar **10** as a guide or a jig.

The rotary screen **1** may be mounted on the machine frames **4** and **5** again according to the reverse operation to the case where the rotary screen **1** is disconnected from the bearings **6**, **6**.

According to the present invention, the opposite bearings are attached to the support in such a manner that one of the bearings is movable relative to the other in the width direction of the textile-printing machine (this construction being referred to as "A" for convenience). The rotary screen is detachably supported in these bearings (for convenience, this construction being referred to as " B "). The constructions A and B enables even only one person to disconnect the rotary screen from the bearings on the opposite end sides of the rotary

screen, with the bearings being still attached to the textile-printing machine.

According to the present invention, the bar, which extends through the substantially entire length of the rotary screen, is detachably supported by a support member at its front end, i.e., the end extending into the rotary screen. At the same time, the bar is vertically rotatably supported on the machine frames at a point outside of the rotary screen (this construction being referred to as "C" for convenience). The construction C enables even only one person to detach the rotary screen using the bar as a guide or a jig by rotating the bar upwardly to a level where the rotary screen can be withdrawn after disconnecting the rotary screen from the opposite bearings.

The rotary screen is remounted on the machine frames by the reverse procedure to the case where the rotary screen is disconnected from the opposite bearings (i.e., substantially the same operation). Accordingly, even only one person can do the remounting operation in this case, too.

Thus, the present invention enables even only one person to replace a rotary screen in order to change a printing design pattern, color or the like.

In the present invention, when the opposite ends of the rotary screen are the end rings of a smaller diameter than that of the rotary screen, the said constructions A, B and C are more advantageously employed, since the printing portion of the rotary screen is prevented from contacting or hitting the bar that extends through the rotary screen.

As seen above, the present invention enables even only one person to replace a rotary screen of a rotary screen textile printing machine.

Claims

1. A rotary screen textile printing machine comprising a rotary screen **1** and a bar **10** extending through the substantially entire length of the rotary screen **1**, characterized in that: bearings **6, 6** supporting the opposite ends of the rotary screen **1** are attached to a support **60** in such a manner that one of the bearings **6**, **6** is movable relative to the other in the width direction of the textile printing machine; the rotary screen **1** is detachably supported by the bearings **6**, **6**; the end of the bar **10** extending into the rotary screen **1** is detachably supported by a support member **19** mounted on the movable bearing **6**; and the bar **10** is supported on the textile printing machine **5** at a point outside of the rotary screen **1** in a vertically rotatable manner.

2. A rotary screen textile printing machine according to claim **1**, wherein the rotary screen **1** has end rings **1R**, **1R** of a diameter smaller than that of the rotary screen **1**.

FIG. 1

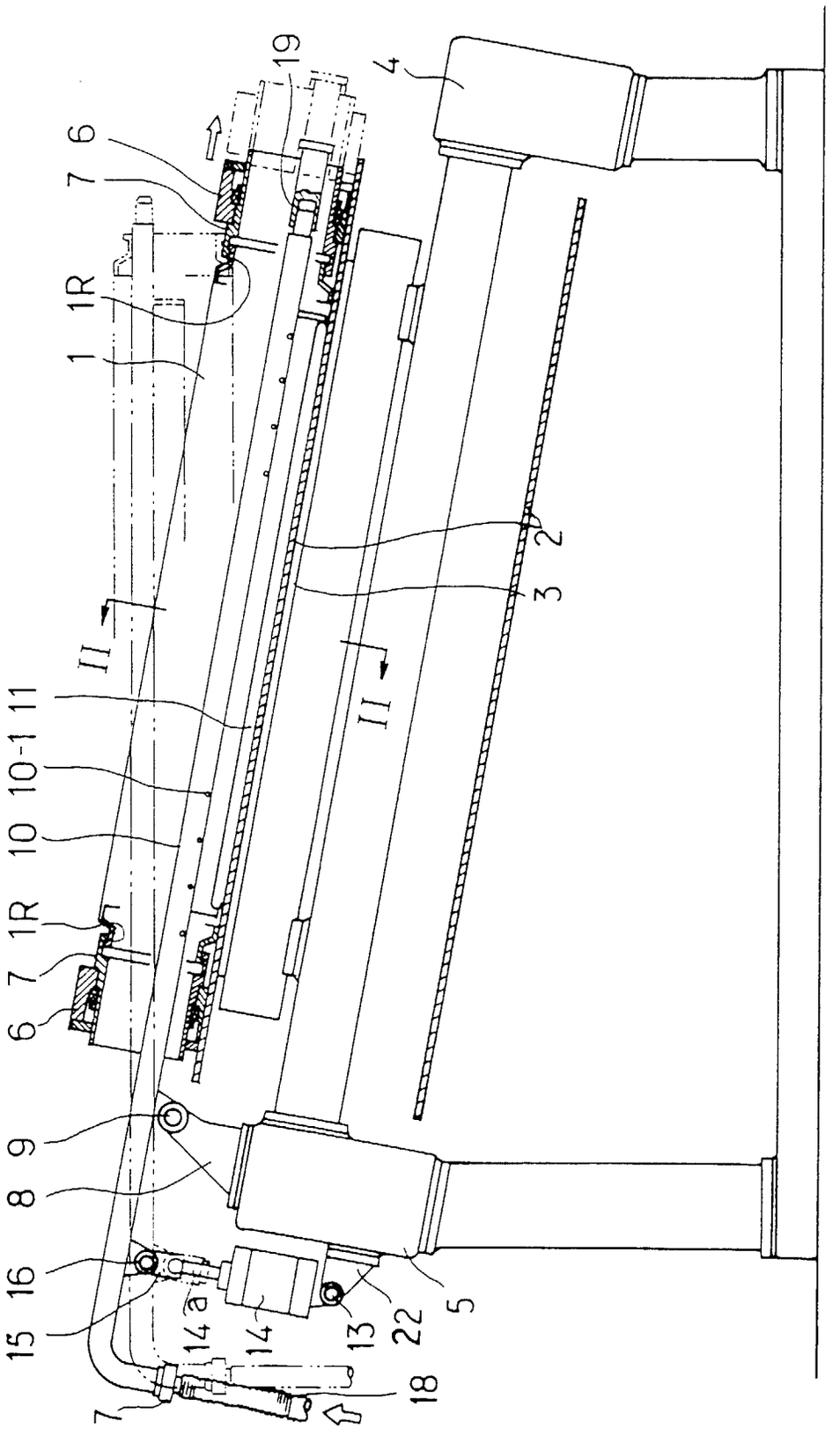


FIG. 2

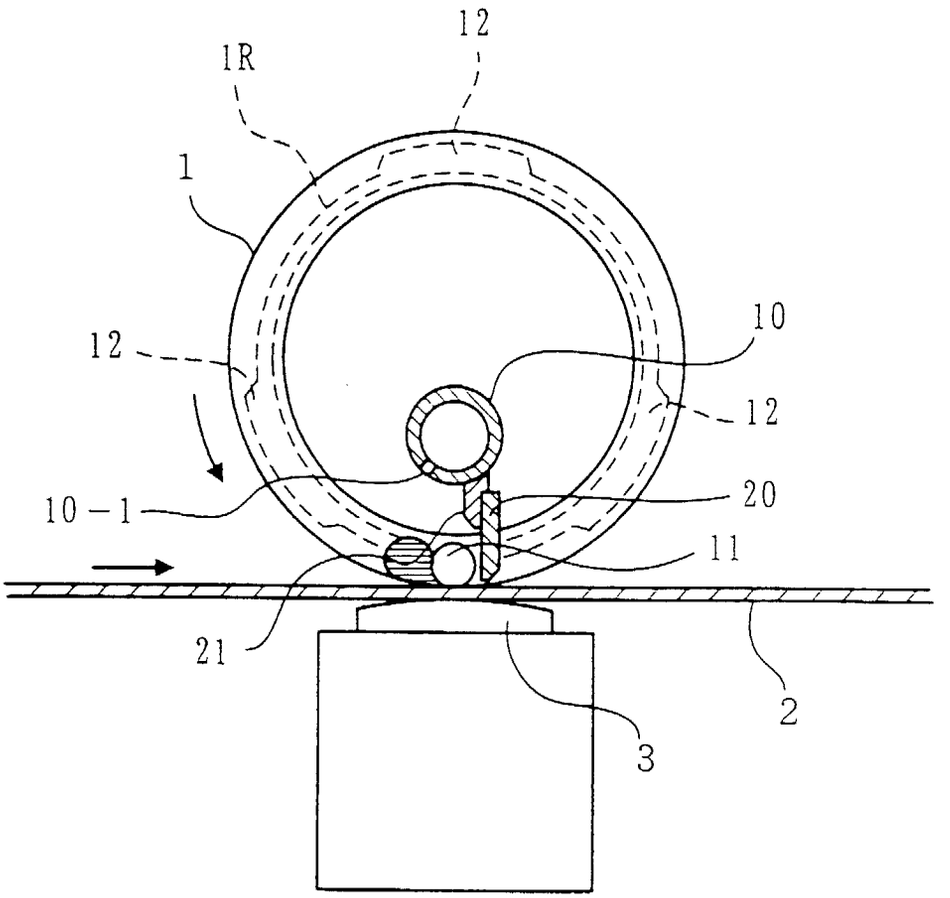


FIG. 3

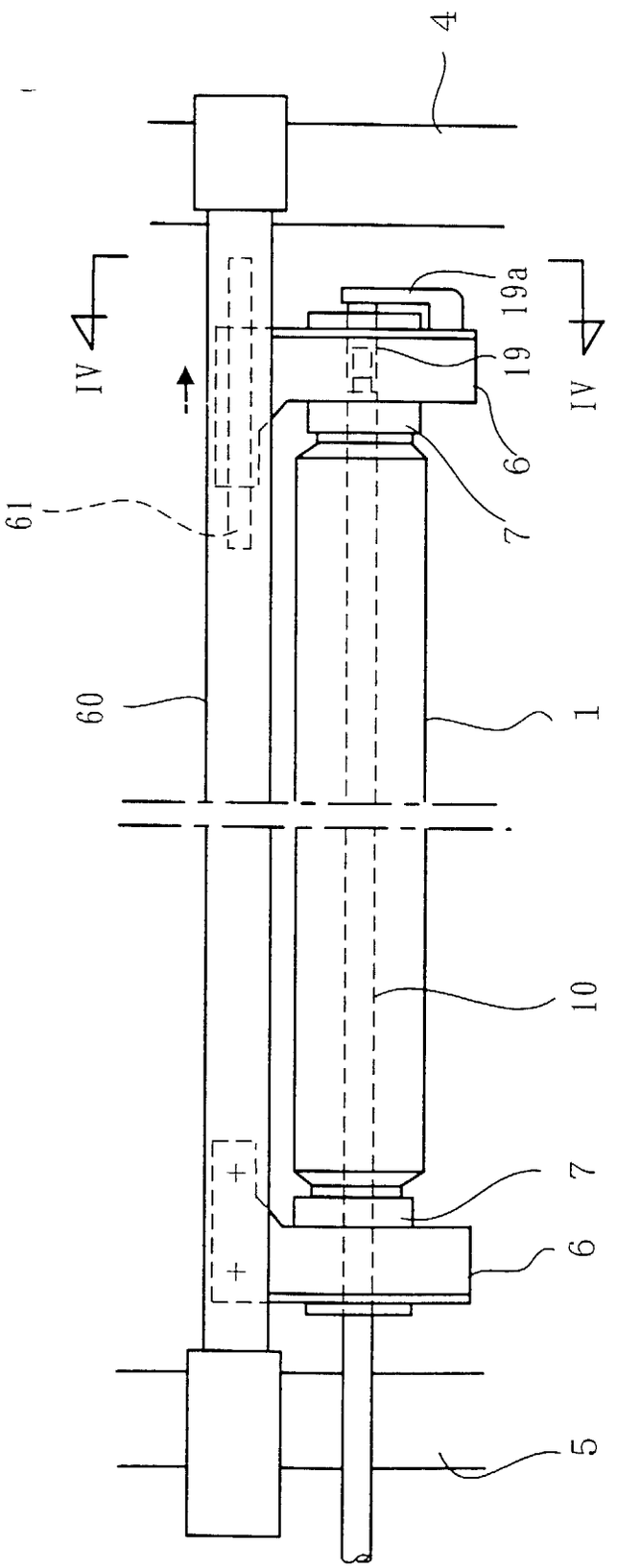


FIG. 4

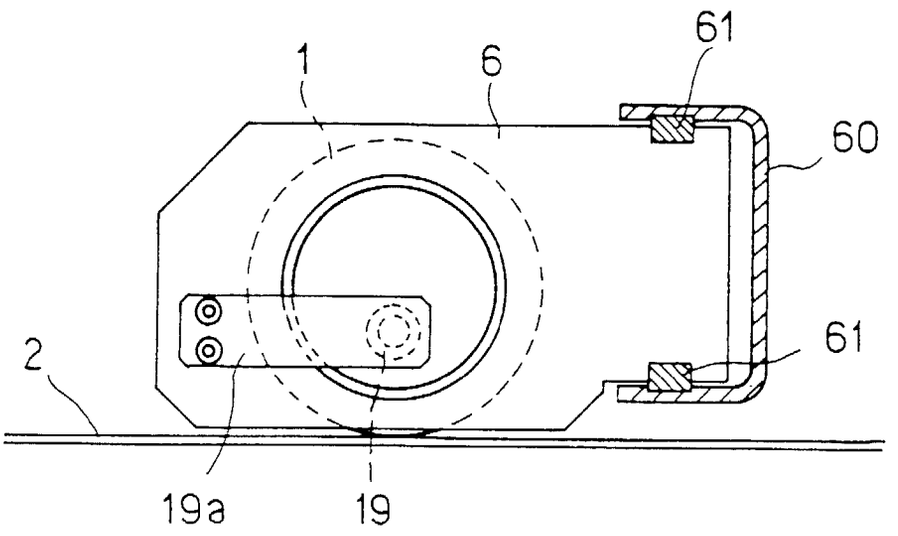


FIG. 5

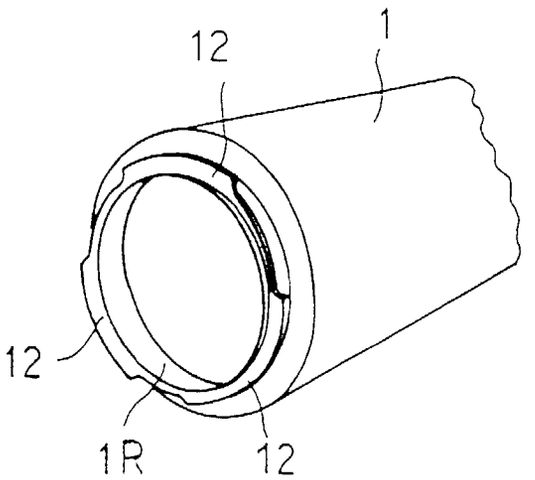


FIG. 6

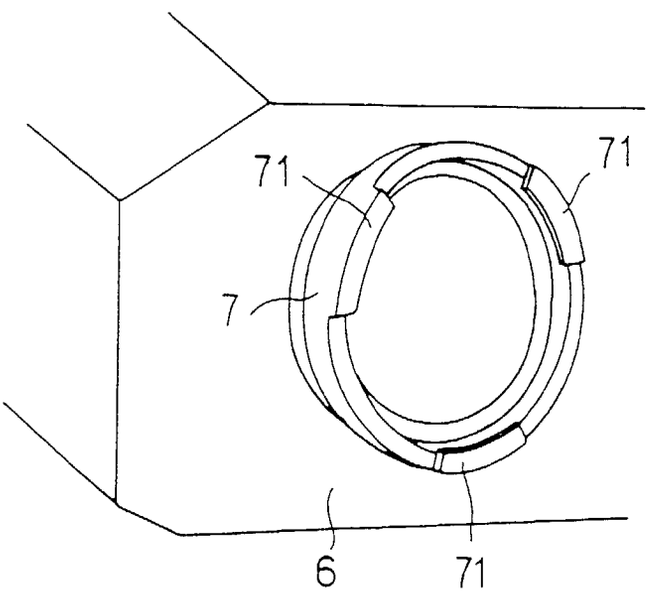
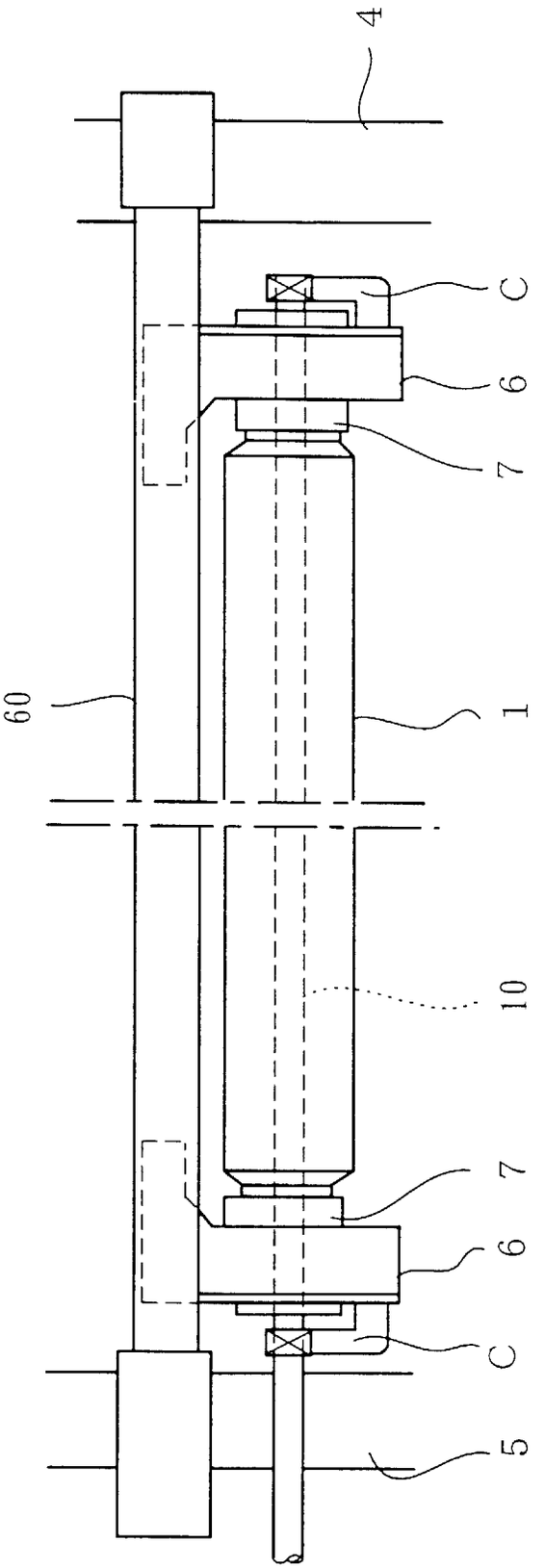


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 0431

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	AT 382 821 B (ZIMMER, JOHANNES) 10 April 1987 * the whole document *	1,2	B41F15/08 B41F15/38
A	US 4 838 159 A (BÖHM) 13 June 1989		
A	AT 356 679 B (ZIMMER, JOHANNES) 12 May 1980		
A	GB 2 040 227 A (MATHIAS MITTER) 28 August 1980		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B41F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 May 1998	DIAZ-MAROTO, V

CATEGORY OF CITED DOCUMENTS

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