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

(11) EP 1 018 308 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
12.07.2000 Bulletin 2000/28

(21) Application number: **99909207.5**

(22) Date of filing: **17.03.1999**

(51) Int. Cl.[7]: **A44C 5/10**

(86) International application number:
PCT/JP99/01328

(87) International publication number:
WO 99/47016 (23.09.1999 Gazette 1999/38)

(84) Designated Contracting States:
CH DE LI

(30) Priority: **17.03.1998 JP 8509798**

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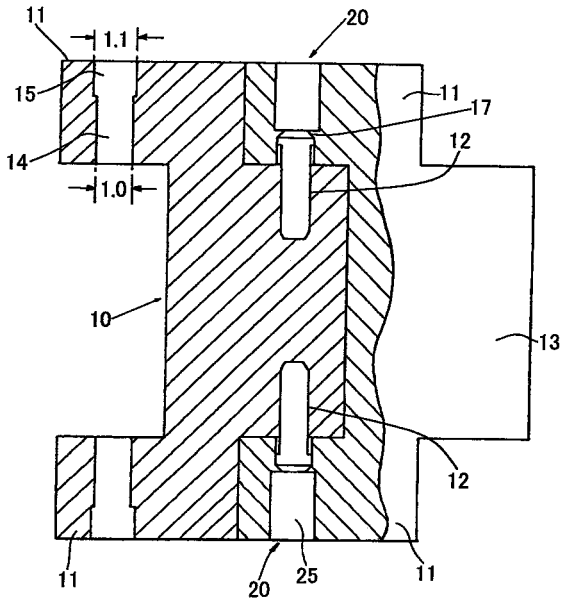
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(54) **BLOCK CONNECTING STRUCTURE AND BAND-SHAPED ORNAMENT**

(57) A link (10) having a center connecting portion (13) having a first hole (14), a pair of outside connecting portions (11) having a second hole having a larger diameter than the first hole, and a pair of pins (20) are provided. Each of the pins comprises a shaft (24) to be inserted in the first and second holes, a force fit portion (25) having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion in a taper shape. The adjacent links are connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

FIG. 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a structure for connecting pins and links of a band and to a personal adornment band, and more particularly to a structure having a feature in a connecting portion of a pin and a link.

BACKGROUND ART

[0002] Heretofore there has been known a technique for manufacturing a watch band by connecting links with pins.

[0003] Fig. 15 shows a part of a conventional watch band. A pin 53 has knurls 54 at both end portions. The pin 53 is rotatably inserted in a hole of an intermediate link 51a and in holes of connecting links 51b, and the knurl 54 is force fitted in a hole 52 of each side link 51. Thus, a watch band is formed by connecting links with pins.

[0004] However, the force fit of the knurl 54 to the hole 52 becomes loose because of the wear of the knurl. Consequently there is the problem that the pin 53 is disengaged from the hole 52.

[0005] In the band shown in Fig. 16, a pair of pins 61 are inserted in holes of an intermediate link 62b and holes of connecting links 63, and a knurl 61a of each pin 61 is force fitted in a hole of a side link 62a (62c). An ornament plate 64 is secured to the outside surface of the side link 62a by a screw 65.

[0006] However, the force fit of the knurl 61a to the hole of the side link becomes loose because of the wear of the knurl. Consequently there is the problem that the pin 61 is disengaged from the hole, so that the watch band is disassembled.

[0007] In the prior arts, the problem that the pin disengages from the side link can not be resolved.

[0008] Furthermore it is necessary to accurately process the link and pin, and there is the problem that the number of parts increases.

[0009] An object of the present invention is to provide a connecting structure for a link and a pin wherein the connecting strength of the link and pin is increased.

[0010] Another object of the present invention is to provide a personal adornment band wherein the connecting strength between a link and pin is increased with a small number of parts.

DISCLOSURE OF THE INVENTION

[0011] A band link connecting structure according to the present invention is characterized in that the structure comprises, a link having a center connecting portion projecting from a central portion of one of sides of the link in a longitudinal direction of the band, and a pair of outside connecting portions projecting from the other side of the link in the reverse direction, a pair of first holes formed in the center connecting portion, a second hole formed in each of the outside connecting portions, opening to the inside of the outside connecting portion, and having a same diameter as the diameter of the first hole, a third hole formed in the outside connecting portion, opening to the outside of the outside connecting portion, coaxial with the second hole, and having a diameter larger than the second hole, a pair of pins for connecting adjacent links, each of the pins comprising a shaft to be inserted in the first and second holes, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion in a taper shape, the adjacent links being connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

[0012] The neck portion is tapered toward the force fit portion.

[0013] The neck portion may be tapered toward the shaft.

[0014] In another aspect of the present invention, the band link connecting structure comprises an inside link, a pair of outside links at both sides of the inside link, a first hole formed in the inside link, penetrating the link, a second hole formed in each of the outside links, opening to the inside of the outside link, and having a same diameter as the diameter of the first hole, a third hole formed in the outside link, coaxial with the second hole, and having a diameter smaller than the second hole, a pin for connecting the inside link and outside links, the pin comprising a shaft to be inserted in the third hole, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second hole, and a neck portion formed between the shaft and the force fit portion in a taper shape, the inside and outside links being connected by inserting the shaft in the third hole and force fitting the force fit portion in the second hole.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

Fig. 1 is a plan view of a part of a watch band of a first embodiment of the present invention, in which a part of links is cut away;
Fig. 2 is a plan view of a pin;
Fig. 3 is a plan view of another pin;
Fig. 4 is a sectional view of a link in a second embodiment;
Fig. 5 is a sectional view of a third embodiment;
Fig. 6 is a plan view of a pin in the third embodiment;
Fig. 7 is a plan view showing the connection between a link and a pin;
Fig. 8 is a plan view showing the connection

between a pair of links and pins;

Fig. 9 is an illustration showing a first wall;

Fig. 10 is a sectional view showing another example;

Fig. 11 is a plan view of a pin of a fourth embodiment;

Figs. 12 through 14 are plan views of watch bands;

Figs. 15 and 16 are sectional views of conventional watch bands.

BEST MODE FOR EMBODYING THE INVENTION

[0016] Embodiments of the present invention will be described with reference to drawings.

[0017] Figs. 1-3 show a watch band of the first embodiment of the present invention. The band comprises links 10 and pins 20. As shown in Fig. 1, the link 10 has a Y shape, comprising a pair of outside connecting portions 11 projecting from one of longitudinal directions of the band, and a center connecting portion 13 projecting from a central portion of the link in the reverse direction. The center connecting portion 13 is inserted in a recess formed between the outside connecting portions 11 of the adjacent link 10, and the adjacent links are connected by the pins 20.

[0018] A first hole 14 is formed in each of the outside connecting portions 11 in an inside range, and a second hole 15 having a larger diameter than the first hole 14 at the outside portion of the first hole. In the center connecting portion 13, a pair of holes 12 each having the same diameter as the first hole 14 at the both sides thereof so as to oppose to the first hole 14 when inserted in the recess of the adjacent link.

[0019] As shown in Fig. 2, the pin 20 comprises a shaft 24, a force fit portion 25 having a diameter larger than that of the shaft 24, and a neck portion 21 between the shaft 24 and the force fit potion 25. The neck portion 21 is tapered toward the force fit portion 25. A chamber 26 is formed on the outer end of the shaft 24 so that the shaft can be easily inserted in the hole 12. The inner end of the shaft 24 has a large diameter portion 24c. The tapered end of the neck portion 21 is formed into a diameter smaller than that of the shaft 24. The shaft 21 is formed so as to be rotatably inserted in the hole 12, and the force fit portion 25 is formed so as to be force fitted in the hole 15.

[0020] It is preferable to make the pin 20 of a material harder than the link 10.

[0021] The pin 20 is formed, for example, at dimensions shown in Fig. 3. The force fit portion 25 has the length of 2.0mm, the diameter of 1.1mm, the large diameter portion 24c is 1.0mm in diameter, the shaft 24 has the diameter of 0.8mm. The neck portion 21 has the diameter of 0.7mm at the smaller end and the inclined angle of 30°. The length of the neck portion 21 and the large diameter portion 24c is 0.7mm.

[0022] In order to connect adjacent links, the center connecting portion 13 of one of the links is inserted in the recess between the outside connecting portions 11 of the other link, and shaft 24 of each pin 20 is inserted in the holes 12 and 14, and the force fit portion 25 is force fitted in the hole 15. The force fit portion 25 abuts on the shoulder of the hole 15 to be stopped. However, the force fit potion 25 is further jammed so that the portion is crushed in the axial direction. As a result, the diameter of the force fit portion is increased, thereby the contact pressure between the force fit portion and the inner wall of the hole 15 is excessively increased.

[0023] Since the neck portion 21 is formed between shaft 24 and the force fit portion 25, a part of the inside wall of the first hole 14 enters the recess on the neck portion 21 by the deformation of the part when the force fit portion 21 is forcibly inserted in the hole 14. As a result, a wedge portion 17 having a wedge shape in section is formed in the recess as shown in Fig. 1. The wedge portion 17 effects to prevent the pin 20 from getting out of the links.

[0024] The link 10 shown in Fig. 4 is different from the link 10 of Fig. 1 in shape. The links in Fig. 1 are the same in shape, the adjacent links in Fig. 4 are different in shape.

[0025] The diameter of the first hole 14 is 1.0mm and the diameter of the second hole 15 is 1.1mm which is the same as that of the force fit portion 25 of the pin 20.

[0026] Figs. 5 through 9 show the third embodiment of the present invention. The same parts as the previous embodiments are identified with the same reference numerals as Figs. 1-4, the description thereof is omitted.

[0027] In the present embodiment, the unit of the band comprises a pair of outside links 10a, a pair of inside links 18, and a pair of pins 20a. The first hole and second hole are formed in the outside link 10a, and the hole 12 is formed in the inside link 18.

[0028] On the both ends of the pin 20a, shafts 24a are formed. A force fit portion 25a is formed in a central portion of the pin 20a. A neck portion 21a is formed between the shaft 24a and the force fit portion 25a.

[0029] Referring to Fig. 6, the shaft 24a has a diameter of 1.1mm, the diameter of the force fit portion 25a is 1.22mm. The diameter of the neck portion 21a is 0.7mm.

[0030] The force fit portion 25a is forcibly inserted in the second hole 15, so that the shoulder portion of the second hole 15 is crushed as shown in Fig. 9 by broken lines. Thus, a wedge portion is formed as shown in Fig. 5, thereby preventing the pin 20a from getting out of the link 10a in the same manner as the first embodiment.

[0031] Fig. 10 shows another example of the outside link 10a. In the example, the end of the first hole 14 is formed into a cone.

[0032] Fig. 11 shows the fourth embodiment of the present invention. Although the neck portion 21 in the above described embodiment is tapered toward the force fit portion, the neck portion 21b of the fourth

embodiment is tapered toward the shaft 24a.

[0033] Since the neck portion 21 in the previous embodiments is tapered in the disengageable direction, the pin may be gotten out of the links when a strong force is applied to the link.

[0034] In the fourth embodiment, the neck portion 21b inclined in the disengage preventing direction. Therefore, the pin does not come out.

[0035] Figs. 12 through 14 show examples of the shape of the link.

PROBABILITY OF INDUSTRIAL EXPLOITATION

[0036] In accordance with the present invention, a sectional wedge shape is formed at the neck portion, thereby preventing the pin from coming off from the link. Consequently, it is not necessary to process knurl on the pin. Thus, the links can be surely connected by a pin having a simple construction.

Claims

1. A band link connecting structure comprising:

a link having a center connecting portion projecting from a central portion of one of sides of the link in a longitudinal direction of the band, and a pair of outside connecting portions projecting from the other side of the link in the reverse direction;
a pair of first holes formed in the center connecting portion;
a second hole formed in each of the outside connecting portions, opening to the inside of the outside connecting portion, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside connecting portion, opening to the outside of the outside connecting portion, coaxial with the second hole, and having a diameter larger than the second hole;
a pair of pins for connecting adjacent links, each of the pins comprising a shaft to be inserted in the first and second holes, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion in a taper shape;
the adjacent links being connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

2. The structure according to claim 1 wherein the neck portion is tapered toward the force fit portion.

3. The structure according to claim 1 wherein the neck portion is tapered toward the shaft.

4. A personal adornment band comprising:

a link having a center connecting portion projecting from a central portion of one of sides of the link in a longitudinal direction of the band, and a pair of outside connecting portions projecting from the other side of the link in the reverse direction;
a pair of first holes formed in the center connecting portion;
a second hole formed in each of the outside connecting portions, opening to the inside of the outside connecting portion, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside connecting portion, opening to the outside of the outside connecting portion, coaxial with the second hole, and having a diameter larger than the second hole;
a pair of pins for connecting adjacent links, each of the pins comprising a shaft to be inserted in the first and second holes, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion in a taper shape;
the adjacent links being connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

5. A band link connecting structure comprising:

an inside link;
a pair of outside links at both sides of the inside link;
a first hole formed in the inside link, penetrating the link;
a second hole formed in each of the outside links, opening to the inside of the outside link, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside link, coaxial with the second hole, and having a diameter smaller than the second hole;
a pin for connecting the inside link and outside links, the pin comprising a shaft to be inserted in the third hole, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second hole, and a neck portion formed between the shaft and the force fit portion in a taper shape;
the inside and outside links being connected by inserting the shaft in the third hole and force fitting the force fit portion in the second hole.

6. The structure according to claim 5 wherein the neck portion is tapered toward the shaft.

7. The structure according to claim 5 wherein the neck portion is tapered toward the force fit portion.

8. A personal adornment band comprising:

an inside link;
a pair of outside links at both sides of the inside link;
a first hole formed in the inside link, penetrating the link;
a second hole formed in each of the outside links, opening to the inside of the outside link, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside link, coaxial with the second hole, and having a diameter smaller than the second hole;
a pin for connecting the inside link and outside link, the pin comprising a shaft to be inserted in the third hole, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second hole, and a neck portion formed between the shaft and the force fit portion in a taper shape;
the inside and outside links being connected by inserting the shaft in the third hole and force fitting the force fit portion in the second hole.

Amended claims under Art. 19.1 PCT

1. A band link connecting structure comprising:

a link having a center connecting portion projecting from a central portion of one of sides of the link in a longitudinal direction of the band, and a pair of outside connecting portions projecting from the other side of the link in the reverse direction;
a pair of first holes formed in the center connecting portion;
a second hole formed in each of the outside connecting portions, opening to the inside of the outside connecting portion, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside connecting portion, opening to the outside of the outside connecting portion, coaxial with the second hole, and having a diameter larger than the second hole;
a pair of pins for connecting adjacent links, each of the pins comprising a shaft to be inserted in the first and second holes, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion and at a portion adjacent the second hole in a taper shape;
the adjacent links being connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

2. The structure according to claim 1 wherein the neck portion is tapered toward the force fit portion.
3. The structure according to claim 1 wherein the neck portion is tapered toward the shaft.
4. A personal adornment band comprising:

a link having a center connecting portion projecting from a central portion of one of sides of the link in a longitudinal direction of the band, and a pair of outside connecting portions projecting from the other side of the link in the reverse direction;
a pair of first holes formed in the center connecting portion;
a second hole formed in each of the outside connecting portions, opening to the inside of the outside connecting portion, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside connecting portion, opening to the outside of the outside connecting portion, coaxial with the second hole, and having a diameter larger than the second hole;
a pair of pins for connecting adjacent links, each of the pins comprising a shaft to be inserted in the first and second holes, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second and third holes, and a neck portion formed between the shaft and the force fit portion and at a portion adjacent the second hole in a taper shape;
the adjacent links being connected by inserting the shaft in the first hole and force fitting the force fit portion in the third hole.

5. A band link connecting structure comprising:

an inside link;
a pair of outside links at both sides of the inside link;
a first hole formed in the inside link, penetrating the link;
a second hole formed in each of the outside links, opening to the inside of the outside link, and having a same diameter as the diameter of the first hole;
a third hole formed in the outside link, coaxial with the second hole, and having a diameter smaller than the second hole;
a pin for connecting the inside link and outside links, the pin comprising a shaft to be inserted in the third hole, a force fit portion having a diameter larger than the diameter of the shaft

and to be forcibly fitted in the second hole, and a neck portion formed between the shaft and the force fit portion and at a portion adjacent the third hole in a taper shape;

the inside and outside links being connected by inserting the shaft in the third hole and force fitting the force fit portion in the second hole.

6. The structure according to claim 5 wherein the neck portion is tapered toward the shaft.

7. The structure according to claim 5 wherein the neck portion is tapered toward the force fit portion.

8. A personal adornment band comprising:

an inside link;

a pair of outside links at both sides of the inside link;

a first hole formed in the inside link, penetrating the link;

a second hole formed in each of the outside links, opening to the inside of the outside link, and having a same diameter as the diameter of the first hole;

a third hole formed in the outside link, coaxial with the second hole, and having a diameter smaller than the second hole;

a pin for connecting the inside link and outside link, the pin comprising a shaft to be inserted in the third hole, a force fit portion having a diameter larger than the diameter of the shaft and to be forcibly fitted in the second hole, and a neck portion formed between the shaft and the force fit portion and at a portion adjacent the third hole in a taper shape;

the inside and outside links being connected by inserting the shaft in the third hole and force fitting the force fit portion in the second hole.

FIG. 1

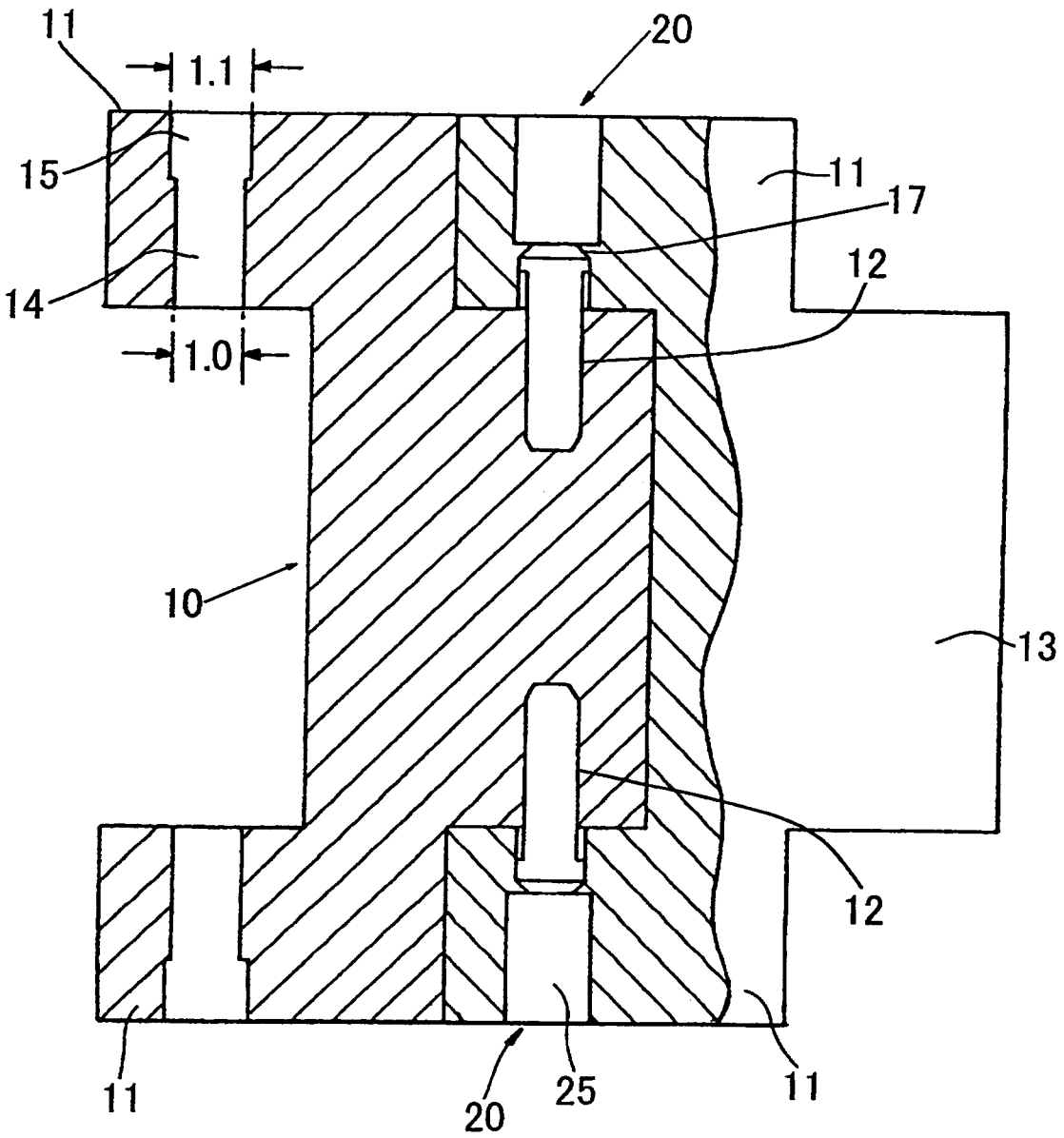


FIG. 2

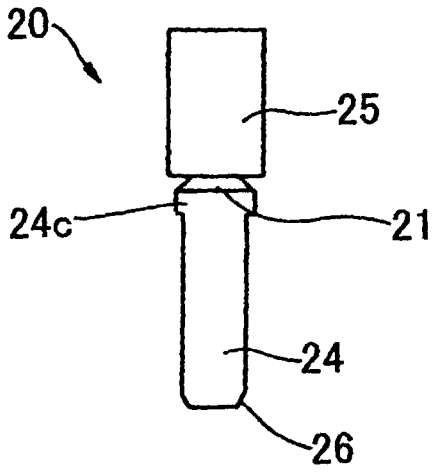


FIG. 3

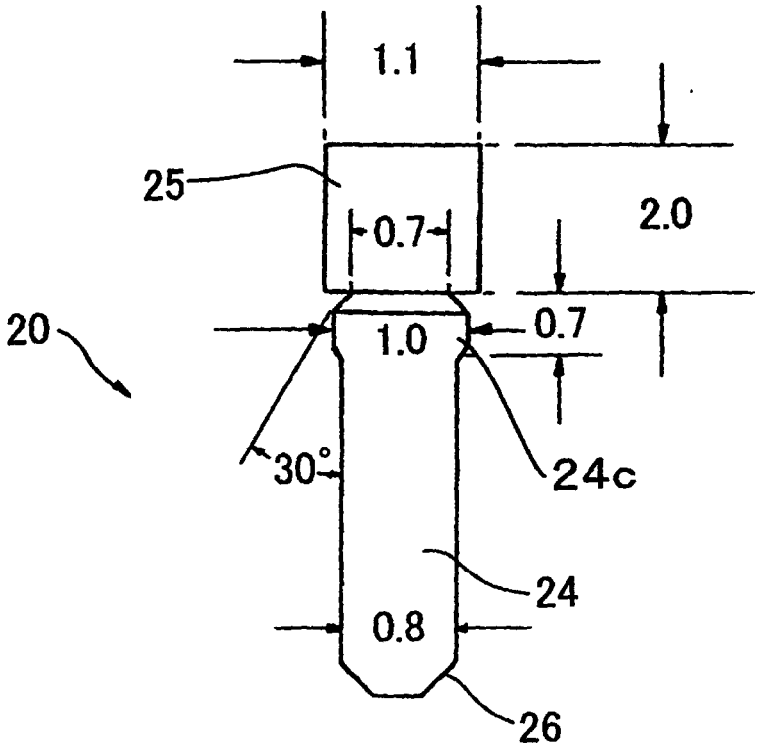


FIG. 4

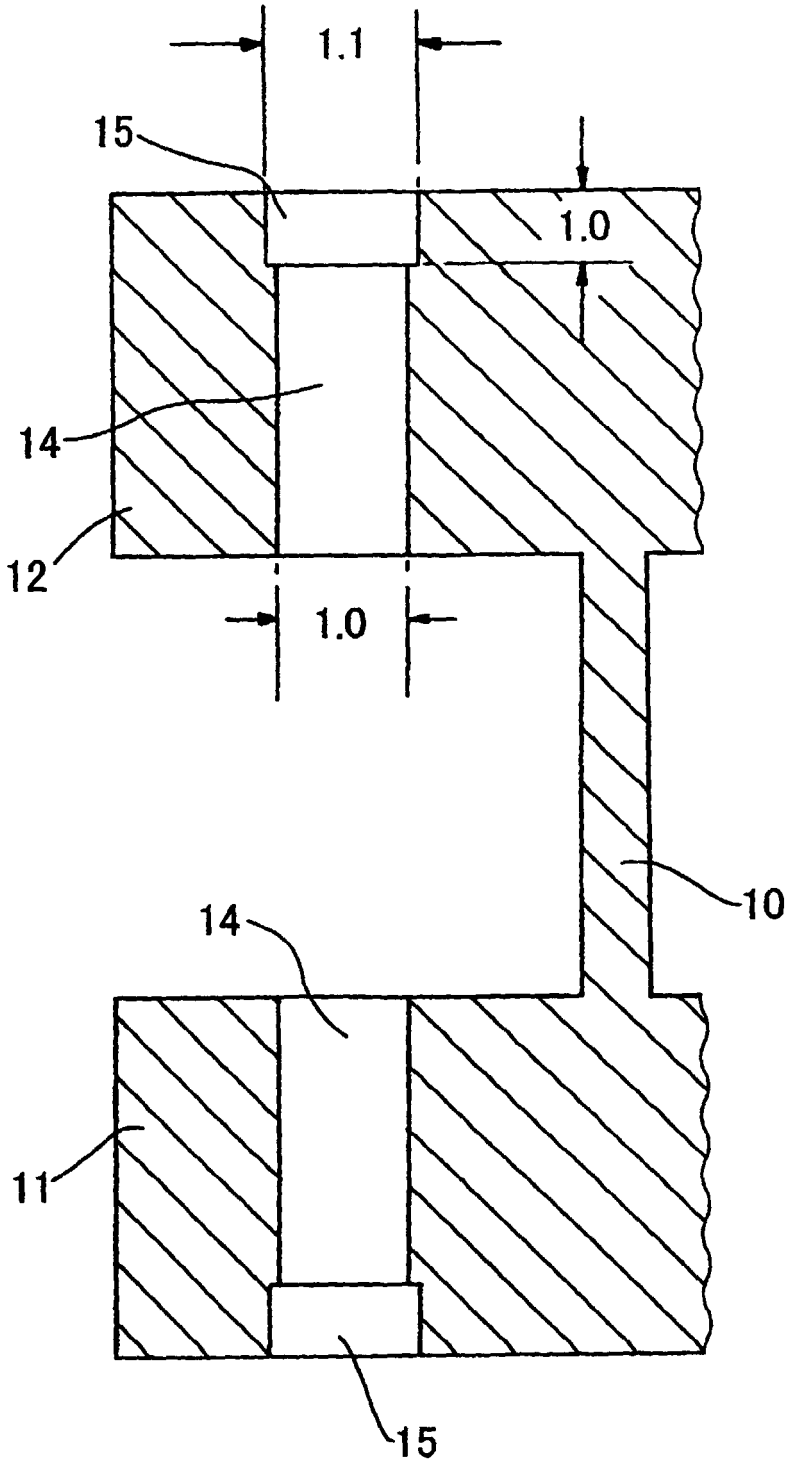


FIG. 5

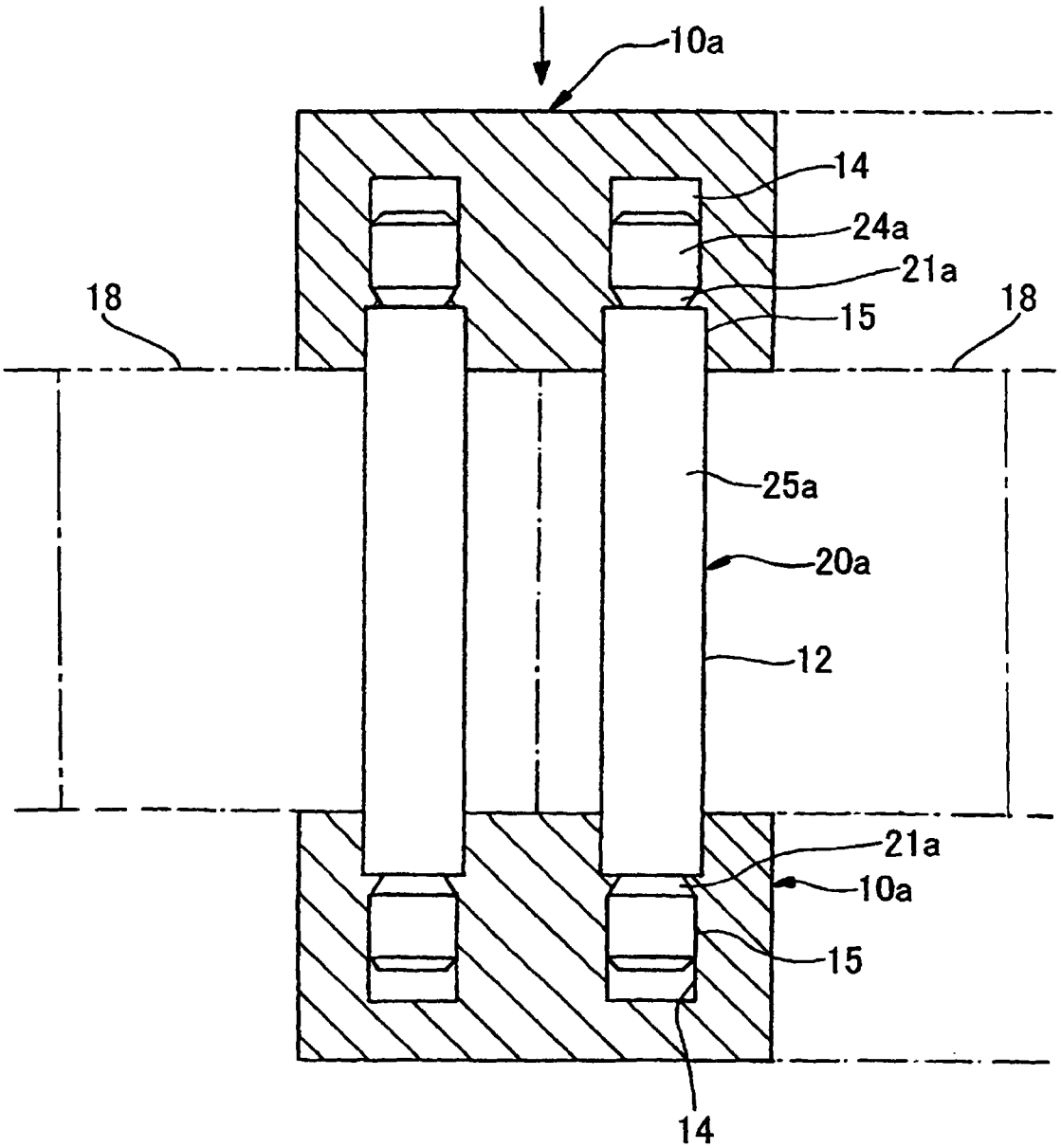


FIG. 6

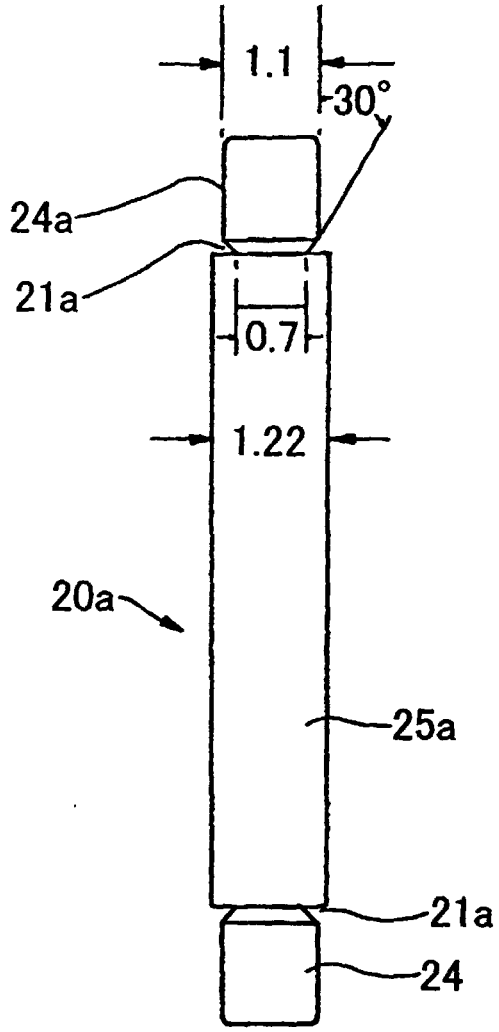


FIG. 7

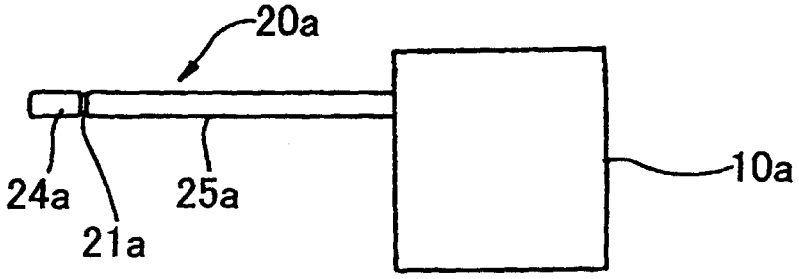


FIG. 8

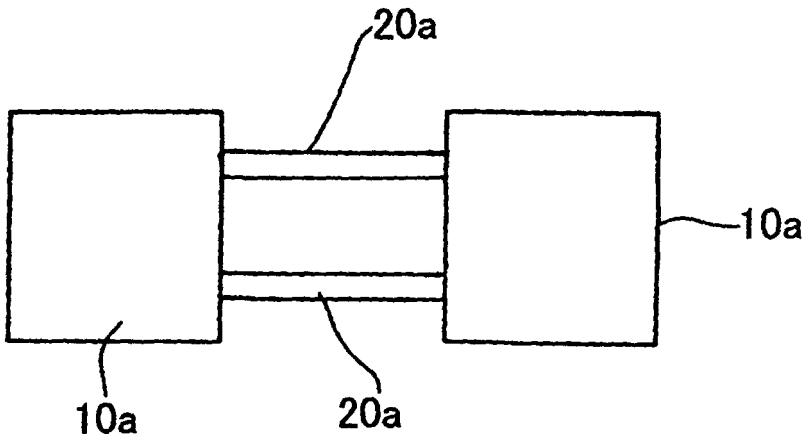


FIG. 9

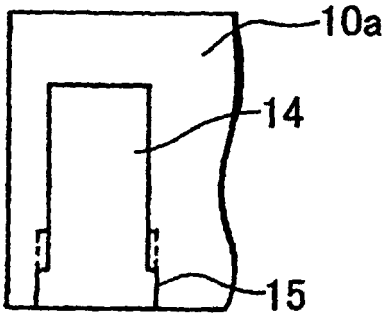


FIG. 10

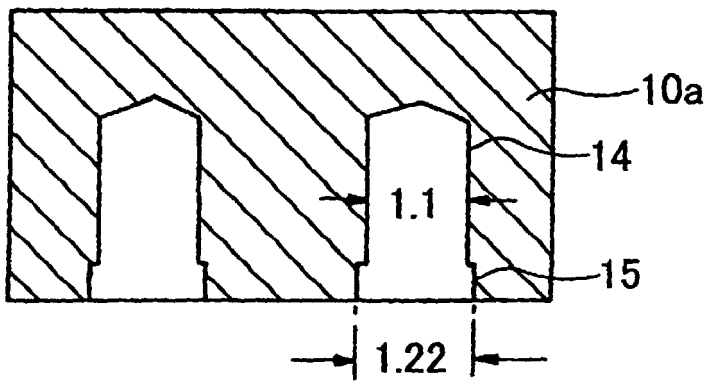


FIG. 11

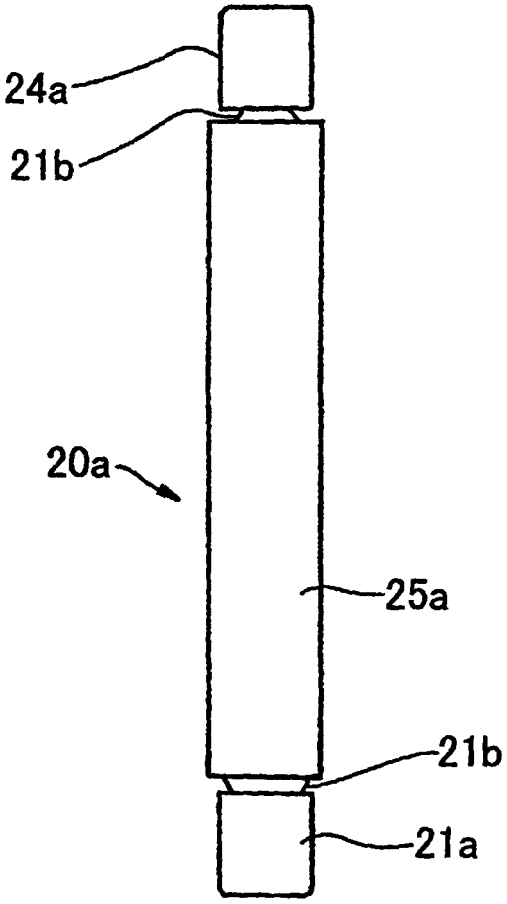


FIG. 12

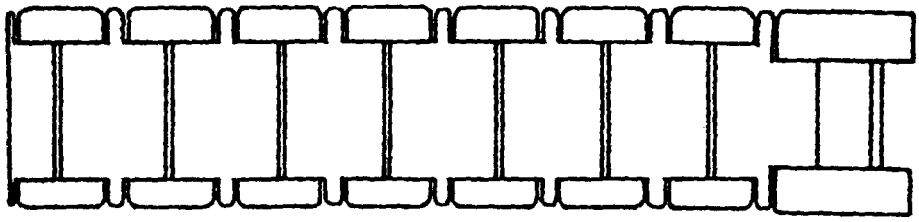


FIG. 13

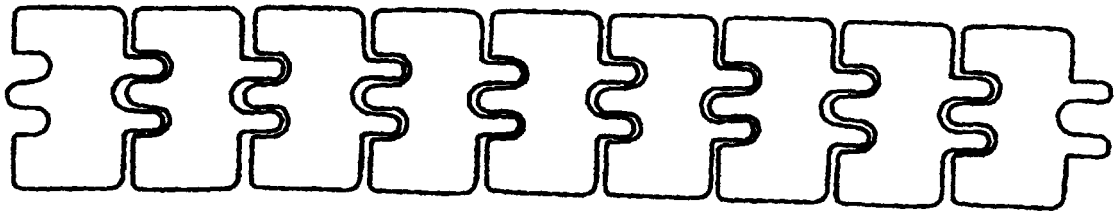


FIG. 14

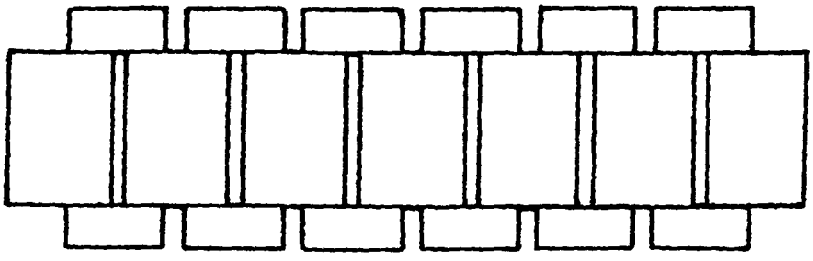


FIG. 15

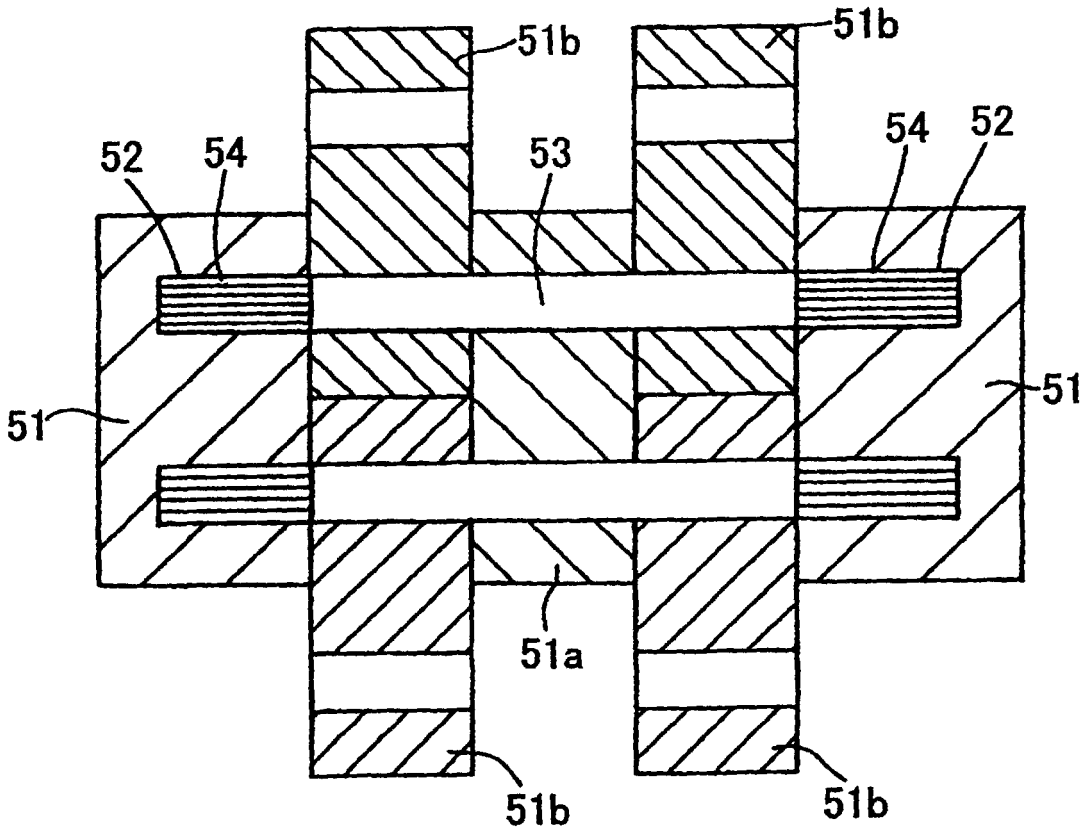
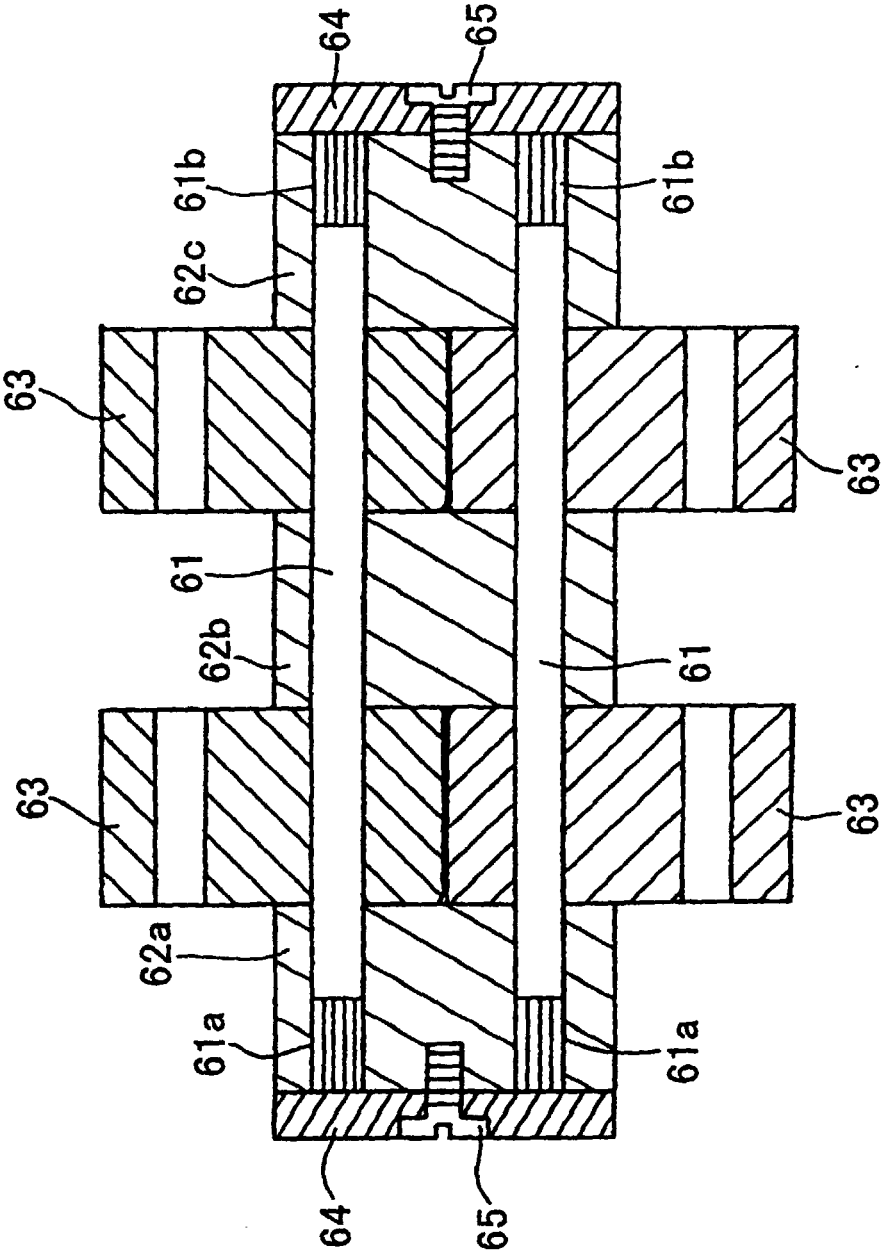


FIG. 16



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/01328

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[6] A44C5/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[6] A44C5/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1926-1999 Toroku Jitsuyo Shinan Koho 1994-1999
Kokai Jitsuyo Shinan Koho 1971-1999

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP, 05-015816, U (Moriyoshi Hayashi), 2 March, 1993 (02. 03. 93) (Family: none)	1-4
Y	JP, 56-002809, U (Banbi,K.K.), 12 January, 1981 (12. 01. 81) (Family: none)	1-4
Y	JP, 58-168212, U (Ageo Seimitsu K.K.), 9 November, 1983 (09. 11. 83) (Family: none)	5-8
Y	JP, 3033872, U (Banbi,K.K.), 13 November, 1996 (13. 11. 96) (Family: none)	2, 3, 6, 7
Y	JP, 06-013519, U (Ageo Seimitsu K.K.), 22 February, 1994 (22. 02. 94) (Family: none)	1, 4, 5, 8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means
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Date of the actual completion of the international search	Date of mailing of the international search report
11 June, 1999 (11. 06. 99)	22 June, 1999 (22. 06. 99)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
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