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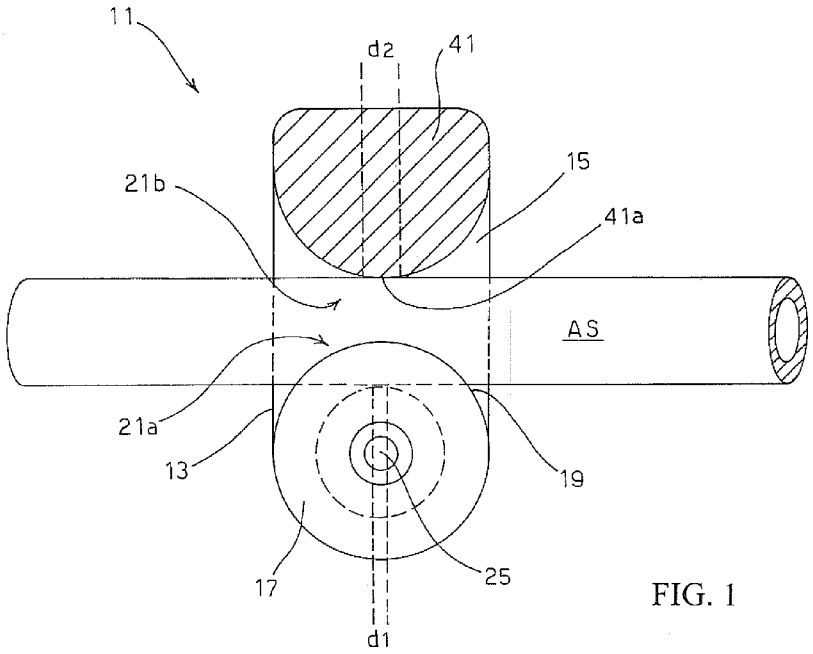


FIG. 1

(57) **Abstract**: Support device (11) for slidable shafts or rods of table soccer games, comprising a frame (13) in which a seat (15) is formed for the passage of a rod (AS) slidable along its axis, and at least one pulley or wheel (17), provided with race and rim (19), respectively, and rotatably associated with the frame so that said race or rim defines a portion of said seat, the remaining seat portion being closed by said frame (13).

WO 2011/042861 A2

# SUPPORT DEVICE FOR SLIDABLE SHAFTS OF TABLE SOCCER GAMES

## DESCRIPTION

### Technical field

The present invention relates to a support device for slidable shafts or rods of table soccer (or football) games.

More precisely, the invention relates to a support device for the rods of table soccer games, which rods, as known, are capable of axially sliding along a direction parallel to their longitudinal axis and of rotating about such axis, even at the same time.

### Prior art

As known, a table soccer game includes a plurality of slidable rods, typically two pairs for each player or playing team, on which the blocks reproducing the player figures are mounted.

In some cases, the slidable rods transversally cross the whole game space and slide within fixed supports housed in the opposite walls of the two lateral flanks or sides of the table, from which sides the rods project.

In other cases, the rods are divided into two telescopic parts, of which only one is slidably supported on a lateral table side, while the other one is rigidly secured to the wall of the opposite side and acts as a guide for the first part.

In both cases, the rods or the parts thereof that are to axially slide relative to the table side need to be adequately supported, so as to allow the sliding and at the same time the rotation of the rod relative to the support.

Examples of known embodiments of table soccer games are disclosed in GB 394582, US 3724851 and US 2008/0197564.

One of the problems encountered in manufacturing table soccer games is how to make easy and smooth (i.e. such that the rods do not stick) the sliding and simultaneous rotation of the rods. Actually, it is known that the sharp and violent movements imparted by the players to the rods often cause annoying sticking phenomena.

For such reason, the slidable rods are generally supported by bushings associated with the side walls of the table.

FR 1.146.898 discloses a table football game having slidable rods in which the conventional bushings have been replaced by a pair of rotating pulleys between which the slidable rod is inserted. The two pulleys are mounted with parallel axes, arranged on a plane perpendicular to the longitudinal rod axis, which substantially coincides with the

sliding direction of the same rod. The pulleys are mounted between a pair of plates that are housed in the side walls of the game table.

This arrangement has advantages over the conventional systems equipped with bushings, since the rotating pulleys make the longitudinal sliding and the rotation of the rod gentler. However, it is clearly apparent that the above arrangement requires that the pulleys are perfectly aligned, with consequent greater manufacturing difficulty ad cost increase. Moreover, because of the above need for a very precise alignment, the above arrangement is not suitable for making decomposable supports allowing introducing the rod transversally to the sliding direction. For that reason, the rods are to be axially introduced between the pulleys, and this entails the need to remove the handle or the player figures when already present on the rod.

A further drawback of such an arrangement comprising two pulleys is related to the great transversal extension of the device, which in the whole substantially corresponds to the sum of the pulley diameters and the rod diameter.

In the known embodiments, moreover, as the game is used, the smoothness of the rod movement decreases as the transversal forces incident on the rod increase due to the arising of clearances caused by the imperfect pulley alignment, which alignment, as stated before, is difficult to be obtained.

Therefore, the known devices are not sufficiently effective in maintaining the properties of smooth sliding and rotation constant in all conditions of use of a table soccer game.

Another problem encountered in manufacturing a table football game is related to the difficulty of associating the slidable rod supports with the sides of the game table. Generally, the supports are inserted into suitable seats formed in the sides. Due to the considerable efforts it has to withstand, the support, if it is not firmly secured, tends to produce clearances with respect to the seat housing it, with consequent risks of breakage.

It is the main object of the invention to provide a support device for the slidable rods of table soccer games, which does not suffer from the drawbacks of the prior art and which allows obtaining the gentle and smooth sliding and rotation of the rod relative to the support in all typical conditions of use of the game.

It is another object of the invention to provide a support device of the above kind, which is easy to be mounted and is stable when housed within the sides of the soccer game table.

It is a further object of the invention to provide a device of the above kind, which

has a simple construction and therefore is suitable for being industrially manufactured on a large scale and with limited costs.

The above and other objects are attained by means of the support device as claimed in the appended claims.

Description of the invention

Advantageously, the invention attains the above objects by combining the advantages deriving from the provision, in the frame of the support device, of a rotating member and a stationary abutment and slide surface.

Such an arrangement is advantageous in that it exploits the rolling friction in the zone where the rod rests, i.e. the lower zone when the device is mounted, and the sliding friction only when the rod interferes with the abutment and slide area, which is located above the rod when the device is mounted.

Such an arrangement is also advantageous in that it allows making the manufacture of the device simpler and therefore less expensive.

Moreover, the above arrangement allows reducing the transversal size of the device, i.e. the vertical size when the device is mounted, since the stationary area can be made even with a very thin thickness.

According to a peculiar aspect of the invention, the abutment and slide area extends in a direction parallel to the longitudinal axis of the slidable rod over a significantly greater length than that of the contact area between the slidable rod and the rotating member, measured along the same direction. Such an arrangement allows solving the problem of how to reduce the tendency to the creation of clearances in the known devices equipped with two pulleys between which the slidable rod passes.

In a further aspect of the invention, the abutment and slide area is defined in correspondence of a part made of a material with low friction coefficient, applied onto the frame.

According to a further aspect of the invention, the abutment and slide area is obtained by polishing a corresponding frame portion.

A further, but not the last, advantage of some particular embodiments of the invention is related to the possibility of firmly associating the frame into the structure belonging to the system where the device is incorporated, for instance into the walls of a soccer game table.

Brief Description of the Figures

Some preferred embodiments of the invention, given by way of non limiting

examples, are described hereinafter with reference to the accompanying Figures, in which:

- Fig. 1 is a sectional view of the frame, taken along a plane perpendicular to the axis of rotation of the rotating member, in a first embodiment of the device;
- Figs. 2A to 2D are front views of the rotating member, in an equal number of embodiments
- Figs. 3 and 4 are sectional views of the frame, taken along a plane perpendicular to the sliding direction of the rod, in a second and a third embodiment of the device;
- Fig. 5 is an exploded view of the device in a fourth embodiment;
- Fig. 6 is a cross sectional view of a soccer game table incorporating the device shown in Fig. 5;
- Figs. 7A and 7B show the front and the back face, respectively, of the fastening ring nut according to a second embodiment thereof;
- Figs. 7C and 7D are a side sectional view and a front view, respectively, of the first portion of the fastening ring nut shown in Figs. 7A and 7B;
- Figs. 7E and 7F are a side sectional view and a front view, respectively, of the second portion of the fastening ring nut shown in Figs. 7A and 7B;
- Fig. 8 is an exploded view of the device in a fifth embodiment;
- Fig. 9 is an exploded view of the ring nut shown in Fig. 8;
- Fig. 10 is an exploded view of the central body of the frame shown in Fig. 8, in a variant embodiment;
- Fig. 11 is a schematic view of a sixth embodiment of the support device according to the invention.

Description of some preferred embodiments

The same numerical references have been used in all Figures for identifying equal or functionally equivalent components.

The Figures further show the device in the preferred mounting and use orientation, i.e. with the rotating member and the stationary piece below and above the rod, respectively.

Referring to Fig. 1, there is shown a preferred embodiment of the device according to the invention. The device according to the invention has been generally denoted by reference numeral 11, and it includes a supporting frame 13 in which a longitudinal seat 15 is defined for the passage of rod AS, slidable in a direction parallel to its longitudinal axis.

According to the invention, frame 13 may be a separate unit or it may be integrated

into a more complex structure into which device 11 is incorporated, and moreover it may comprise a single piece or separate pieces that can be associated with one another.

A first portion 21a of seat 15 (lower portion in the Figure) is defined by the peripheral rotating surface of a rotating member associated with frame 13.

In a preferred embodiment of the invention, said rotating member comprises a pulley 17 having a corresponding race 19 and rotatably associated with frame 13 by means of a shaft 25, arranged with its axis of rotation substantially perpendicular to the sliding direction of rod AS, i.e. transversally arranged with respect to frame 13.

The curvature and the depth of race 19 of pulley 17 can be chosen depending on the applications and the cross section of rod AS. Pulley 17 could even have no race, whereby it is equivalent to a corresponding wheel having a flat rim.

Always according to the invention, slidable rod AS is in contact with said at least one wheel or pulley 19 at least at one point or along a line with a different shape depending on the race or rim profile and the rod cross section.

A second portion 21b of seat 15 (upper portion in the Figure), located substantially on the diametrically opposite side of rod AS with respect to the first portion 21a, is on the contrary defined by a piece 41, stationary relative to the frame, which forms an abutment and slide area 41a for rod AS.

According to the invention, piece 41 may be integrated into frame 13 or it may be a separate piece joined with frame 13 by known means, for instance an adhesive. For instance, piece 41 may comprise an element made of plastics, e.g. polypropylene or polystyrene. Moreover, area 41a may be obtained by polishing piece 41.

According to the invention, rod AS is housed within seat 15 in a condition of almost total absence of radial clearance, with reference to the longitudinal axis of rod AS. Namely, rod AS is freely slidable along a direction parallel to its axis while being simultaneously rotatable about the axis itself, but it is substantially prevented by pulley 17 and piece 41 from displacing in seat 15 in a direction perpendicular to said axis, apart from clearances of the order of some tenths of millimetre, for instance 1 to 3 tenths of millimetre. Such a minimum radial clearance causes the absence of interference between rod AS and area 41a when the device is mounted as shown in the Figure and the rod is resting against pulley 17. In use, the rod is quickly manoeuvred to cause the movement of the player figures and can periodically interfere with area 41a of the stationary piece.

Moreover, according to a preferred embodiment of the invention, abutment and slide area 41a extends in a direction parallel to the longitudinal axis of rod AS over a length

"d2" significantly greater than length "d1" of the contact area between rod AS and the rotating member, measured along the same direction. Such a length "d2" may preferably be at least 1 mm, and more preferably at least 2 - 3 mm.

Said area 41a is to create a stationary abutment and slide surface for rod AS, opposite the contact area with the rotating member provided in seat 15, i.e. on the opposite side of rod AS.

Advantageously, according to the invention, thanks to such an arrangement, the sliding and rotational movement of rod AS in seat 15 takes place by rolling friction with respect to the rotating member and with sliding friction with respect to said abutment and slide area 41a.

Hereinafter, some embodiments of the rotating member will be described.

Referring to Fig. 2A, a first embodiment of pulley 17 is shown.

According to this embodiment, pulley 17 has a race 19 and is rotatably associated with frame 13 by means of a shaft or pin 25, whose opposite ends are received in two confronting seats 27 formed in side walls 29 of frame 13.

In the alternative, pin 25 may also be cantilevered, i.e. only one end thereof is received in a seat 27, whereas the opposite end is free. Pulley 17 can rotate relative to the pin and/or the pin can rotate relative to seats 27. Moreover, bearings may possibly be inserted between the pulley and the pin and/or between the pin and seats 27 in frame 13.

In this embodiment, the first portion 21a of seat 15 has, in a plane perpendicular to the sliding direction of rod AS, a substantially half-circular profile and it is defined by race 19 that, in this embodiment, has an arc-shaped profile extending over about 120°.

The second portion 21b of seat 15 is defined by stationary piece 41 that, in the illustrated example, comprises a surface with low friction coefficient, which is applied on frame 13 inside seat 15 and defines abutment and slide area 41a for rod AS. Area 41a extends transversally to the sliding direction of rod AS over an arc of circumference of about 180° and extends longitudinally over a length "d2" significantly greater than length "d1" of the contact area between rod AS and pulley 17, measured along the same direction.

Piece 41 has been made with a very reduced thickness, in order to limit the vertical extension of frame 13 and take advantage of the compactness characteristics of the device.

Referring to Fig. 2B, a second embodiment of pulley 17 is shown, which differs from the first embodiment in that pulley 17 is provided, in correspondence with the central line of race 19, with at least one annular groove 31.

Advantageously, thanks to the provision of annular groove 31, the noise generated by the sliding and the rotation of slidable rod AS, which is in contact with the surface of race 19, is considerably reduced.

Referring to Fig. 2C, a third embodiment of pulley 17 is shown, which differs from the second embodiment in that annular groove 31 houses a ring 33, which is preferably made of a resilient material, for instance charged neoprene, and is aimed at further reducing the noise due to the sliding of the surface of slidable rod AS on the surface of race 19 during the sliding and the rotation of rod AS.

Referring to Fig. 2D, a fourth embodiment of pulley 17 is shown, which differs from the first embodiment in that the pulley and the corresponding race 19 are defined by two parallel wheels 17a, 17b arranged side by side. In the example illustrated, said wheels 17a, 17b are associated with a common transverse shaft 25. However, it is possible to envisage that each wheel is supported by its own shaft and that consequently each wheel can rotate independently of the other. Moreover, in the example illustrated, said wheels 17a, 17b are shown as being slightly spaced apart so as to define annular groove 31, which possibly may house a ring 33. However, it is possible to envisage that wheels 17a, 17b are mounted in contact with each other.

According to the invention, frame 13 may be associated with the fixed structure of a soccer game table, for instance with the sides defining the game space, by integrated or separate means.

Hereinafter, some embodiments of such means will be described.

Referring to Fig. 3, a second embodiment of device 11 is shown, in which frame 13 may be associated with the fixed structure of a soccer game table by integrated means.

According to this embodiment, device 11 includes a frame 13 in which a seat 15 for the passage of a slidable rod AS is defined. Frame 13 has also defined therein a seat 23 for a pulley 17 provided with a race 19 and rotatably associated with frame 13, so that said race 19 defines a portion of said seat 15 and the pulley axis of rotation is substantially perpendicular to the sliding direction of said rod.

Pulley 17 is rotatably associated with frame 13 by a transverse shaft 25 whose opposite ends are housed in two confronting seats 27, formed in lateral walls 29 of frame 13.

In this embodiment, frame 13 is made as a transversally elongated (i.e. vertically elongated in the Figure) and closed annular ring, having a base 35 extending parallel to the axis of shaft 25 and provided with holes 37, with axes perpendicular to the axis of rod AS,

for fastening frame 13 to a support structure of the game table, for instance to the lateral side.

Referring to Fig. 4, a third embodiment of the device is shown, which differs from the first embodiment in that frame 13 is made as a closed annular ring, having on its periphery a plurality of holes 39, four in the example illustrated, with axes parallel to the axis of rod AS, for fastening frame 13 to a support structure.

In both such embodiments, seat 15 is surrounded by frame 13 and has a substantially circular profile delimited in part by the body of frame 13 in which abutment and slide area 41a is defined, and in part by race 19 of the rotating member or pulley 17.

Referring to Fig. 5, an embodiment of the invention is shown in which frame 13 includes two axially retaining ring nuts 47, between which central body 13a of frame 13 is blocked. In this embodiment, central body 13a of frame 13 is open at one side (upwards in the Figure) and consequently seat 15 in which rod AS slides is open in order to allow inserting rod AS through a movement in a direction perpendicular to the sliding direction of rod AS in seat 15. Said ring nuts 47 are intended to abut against the opposite faces of a wall of a support structure, for instance the side of the soccer game table, in which central body 13a of frame 13 is housed. Ring nuts 47 are also provided with a hole 49 through which slidable rod AS passes. Moreover, ring nuts 47 are provided with arc-shaped protrusions 51, crescent like in the example illustrated, and with fastening pins 53 that are bored to allow the passage of fastening screws. Said protrusions 51 and said pins 53 are aimed at firmly retaining ring nuts 47 against the opposite faces of the wall of the support structure, by blocking central body 13a of frame 13 between them. One of said ring nuts 47, or both, may even be rigidly connected to or integrated into central body 13a.

According to this embodiment, the second portion 21b of seat 15 is defined in correspondence of holes 49 in ring nuts 47, and length "d2" of area 41a is substantially equivalent to the longitudinal extension of holes 49, corresponding in turn to the thickness of ring nuts 47.

Referring to Fig. 6, there is shown a soccer game table 101 including a game space 103 defined downwards by a base 105 and laterally by lateral sides 107. Slidable rods AS carrying player figures 109 and equipped with handles 111 are slidably (arrows F1) and rotatably (arrows F2) associated with walls 113 of said lateral sides 107.

Rods AS are associated with walls 113 with the interposition of a support device 11 (one for each side) made in accordance with the embodiment shown in Fig. 5. According to this arrangement, frame 13 of each device 11 is housed in wall 113 inside a throughhole

115 and is firmly retained in the hole thanks to ring nuts 47 secured to the opposite faces of wall 113 by crescent-like annular protrusions 51 and by fastening pins 53.

Referring to Figs. 7A to 7F, there is shown a second embodiment of axially retaining ring nut, here denoted by reference numeral 47'. Ring nut 47' is made of two portions 47'a, 47'b, partially overlapping when assembled and separable so as to clear a portion of hole 49 for allowing the insertion of slidable rod AS in radial direction. According to this embodiment, the first portion 47'a has an angular extension of about 270° and has an opening 55 of about 90° that is closed by the second portion 47'b, which correspondingly has an angular extension of about 90°. Pins 57 and corresponding seats 59 are provided in both portions 47'a, 47'b at the respective overlapping ends 61a, 61b, in order to keep ring nut 47' firmly assembled after rod AS has been inserted into hole 49.

Moreover, ring nut 47' may have protrusions 63 intended to penetrate into central body 13a of frame 13 in order to firmly keep said body 13 in the proper position, thereby preventing axial or lateral displacements or rotations. Moreover, said protrusions 63 may be replaced by corresponding recesses in which protrusions associated with frame 13 are received. If necessary, means for fastening the ring nuts, such as screws or an adhesive, can be provided.

Referring to Figs. 8 and 9, a fifth embodiment of the invention is shown, in which frame 13 includes two axially retaining ring nuts 47", between which central body 13a of frame 13 is blocked. In this embodiment, central body 13a of frame 13 has annular shape and surrounds seat 15 in which slidable rod AS slides. Rod AS can therefore be inserted into seat 15 only through a movement parallel to the sliding direction of the rod in seat 15. Said ring nuts 47" are intended to engage the opposite faces of the wall of a support structure in which the body of frame 13 is housed, for instance side 113 of the soccer game table shown in Fig. 6. Ring nuts 47" are provided with a hole 49 through which rod AS passes, and with possible protrusions 63 penetrating into corresponding holes 65 in frame 13, Protrusions 63 are intended to firmly keep central body 13a of frame 13 in the proper position, thereby preventing axial or lateral displacements or rotations. Screws, not shown, passing through protrusions 63 can be provided in order to fasten ring nuts 47" together. In the example illustrated, the central body of frame 13 has a rectangular or square cross section so that it can be introduced into a hole of complementary shape provided in the side (shown at 113 in fig. 6) of the soccer game table, which hole further prevents the body rotation. Ring nuts 47" packed against opposite external walls of side 113 block frame 13 in side 113 and prevent central body 13a from axially sliding out of its

seat provided in side 113. One of said ring nuts 47" or both may even be rigidly connected to or integrated into central body 13a.

As it can better be seen in Fig. 9, ring nut 47" is made of two portions 47"a, 47"b, partially overlapping when associated together and separable so as to clear a portion of hole 49 for allowing the insertion of rod AS in radial direction. According to this embodiment, the first portion 47"a has an opening 55" that is closed by the second portion 47"b. Pins 57 and corresponding holes 59 are provided in portions 47"a, 47"b, respectively, in order to keep both ring nut portions firmly assembled and mutually centred after rod AS has been inserted into hole 49.

Referring to Fig. 10, a variant embodiment of frame 13 is shown, in which central body 13a of frame 13 comprises two portions 13'a, 13'b that may be associated together in order to close seat 15 after insertion of rod AS, which advantageously can also take place according to a transversal approaching movement. In particular, portion 13'a includes seats 27 for pin 25 rotatably supporting pulley 17, and portion 13'b defines abutment and slide area 41a. Protrusions 67 provided in portion 13'b and complementary seats 69 provided in portion 13'a and intended to receive protrusions 67 allow portions 13'a, 13'b to be assembled and mutually centred. The solution illustrated is particularly advantageous when taken in conjunction with two-part ring nuts 47", in that it allows inserting into frame 13 rods AS already equipped with blocks reproducing the player figures and the handle.

Referring to Fig. 11, a sixth embodiment of the invention is shown, applied to telescopic rods of which only one, AS1, carrying the player figures 109, is slidably supported relative to a first lateral side 113a of the table (the right side in the Figure), whereas the second rod AS2 is rigidly secured to the opposite side 113b (the left side in the Figure) and acts as a guide for the first rod AS1.

In the example illustrated, rod AS1 is supported relative to side 113a by a first device 11 according to the invention. According to this embodiment, there is provided a second support device 11', which is associated with rod AS1 in correspondence of the open end into which rod AS2 penetrates. This second device 11' includes a first pulley 17' and possibly a second pulley 17", both supported by a frame 13'.

In such an arrangement with telescopic rods, slidable rod AS1, when extended, acts as a lever and the force applied onto handle 111 during play is generally directed downwards. This force tends to raise the other end of rod AS1, which will rest against the lower part of inner rod AS2, whereas the end of inner rod AS2 located inside rod A1 will

rest against the upper part inside the latter. At present, in order to avoid the friction arising in such conditions, bushings made of plastics, i.e. elements exploiting the sliding friction, are used.

On the contrary, the invention uses rotating members with rolling friction, namely a first rotating member 17' located on the end of rod AS1 in the lower part. Moreover, always with reference to the example illustrated, at least one wheel or ball or pulley 71 is provided, rotatably associated with the end of rod AS2 housed in rod AS1. Said wheel or ball or pulley 71 is aimed at avoiding excessive clearances between rods AS1 and AS2 and at making their mutual sliding gentler.

When rod AS1 is completely inserted onto the second rod AS2, the force applied onto handle 111 during play is generally directed upwards. This force tends to press the end of rod AS1 downwards against rod AS2, and thus a second rotating member 17" placed on the upper part is advantageous in order to make the sliding of rod AS2 smoother.

Like in the other exemplary application, it is clear that also in this case support devices 11, 11' can advantageously have any of the previously described shapes.

It is clear that the above description has been given only by way of non-limiting example and that further changes and modifications are possible without departing from the scope of the invention as defined in the following claims.

**Patent claims**

1. A support device (11) for the slidable rod (AS) of table soccer games, said rod being capable of axially sliding along a direction parallel to its axis and of simultaneously rotating about such axis, the device comprising:

- a support frame (13);
- a seat (15) defined in the frame for the passage of the slidable rod (AS) in conditions of substantial absence of radial clearances, with reference to the longitudinal rod axis;
- a rotating member (17) associated with the frame so that its axis of rotation is substantially perpendicular to the sliding direction of the rod and so as to define, by its rotating surface (19), a first portion (21a) of said seat;

and being characterised in that a second portion (21b) of the rod seat in the frame, located substantially diametrically opposite the first portion with respect to the rod, is defined by a piece (41) stationary relative to the frame, and in that at least one area (41a) of said stationary piece forms a slide abutment for the rod, so that the sliding and rotational movement of the rod (AS) in the seat (15) takes place by rolling friction with respect to the rotating member (17) and by sliding friction with respect to said abutment and slide area (41a).

2. The device as claimed in claim 1, wherein the support frame (13) can be associated with the structure of the table soccer game by integrated or separate means.

3. The device as claimed in claim 1 or 2, wherein the rotating member (17) includes a pulley or a wheel, provided with race and rim (19), respectively, and wherein said race and rim define the first portion (21a) of said seat (15) for the slidable rod (AS) in the frame (13).

4. The device as claimed in claim 3, wherein the abutment and slide area (41a) extends in a direction parallel to the longitudinal axis of the rod over a length ("d2") significantly greater than the length ("d1") of the contact area between the rod and the rotating member, measured along the same direction.

5. The device as claimed in claim 1, wherein the rod (AS) is received within the seat (15) in the frame in a condition of reduced radial clearance, with reference to the longitudinal axis of the rod (AS), namely, the rod (AS) is freely slidable along a direction parallel to its axis while being simultaneously rotatable about the axis itself, but it is substantially prevented by the pulley (17) and the stationary piece (41) from displacing in the seat (15) in a direction perpendicular to said axis, apart from a clearance of the order of some tenths of millimetre.

6. The device as claimed in any preceding claim, wherein the stationary piece (41) of the frame (13) comprises a surface with low friction coefficient applied onto the frame (13) inside the seat (15) and defining the abutment and slide area (41a) for the rod (AS).

7. The device as claimed in claim 6, wherein the abutment and slide area (41a) extends transversally to the sliding direction of the rod (AS) over an arc of circumference of about 180° and longitudinally over a length ("d2") significantly greater than the length ("d1") of the contact area between the rod and the rotating member, measured along the same direction.

8. The device as claimed in any preceding claim, wherein the rotating member comprises a pulley (17) provided, in correspondence with the central line of the race (19), with at least one annular groove (31).

9. The device as claimed in claim 8, wherein the annular groove (31) houses a ring (33) aimed at reducing the noise due to the sliding of the surface of the slidable rod (AS) on the surface of the race (19).

10. The device as claimed in claim 9, wherein said ring (33) is made of a resilient material, for instance charged neoprene.

11. The device as claimed in claim 1, wherein the frame (13) includes two axial containment ring nuts (47) intended to engage the wall of a support structure where the central body (13a) of the frame (13) is blocked.

12. The device as claimed in claim 11, wherein said ring nuts are provided with a hole (49) for the passage of the rod (AS), with protrusions (51) and with fastening pins (53).

13. The device as claimed in claim 11, wherein the axial containment ring nut (47) is obtained in two parts (47a, 47b), which can be separated to allow the insertion of the rod (AS) in a radial direction.

14. The device as claimed in claim 12, wherein the second portion (21b) of the rod seat (15) is defined in correspondence of the holes (49) in the ring nuts (47), and the length ("d2") of the abutment and slide area (41a) is substantially equivalent to the length of the holes and to the thickness of the ring nuts (47).

15. The device as claimed in claim 1, wherein the central body (13a) of the frame (13) comprises two portions (13'a, 13'b) that may be associated together in order to close the seat (15) of the rod (AS) around said rod.

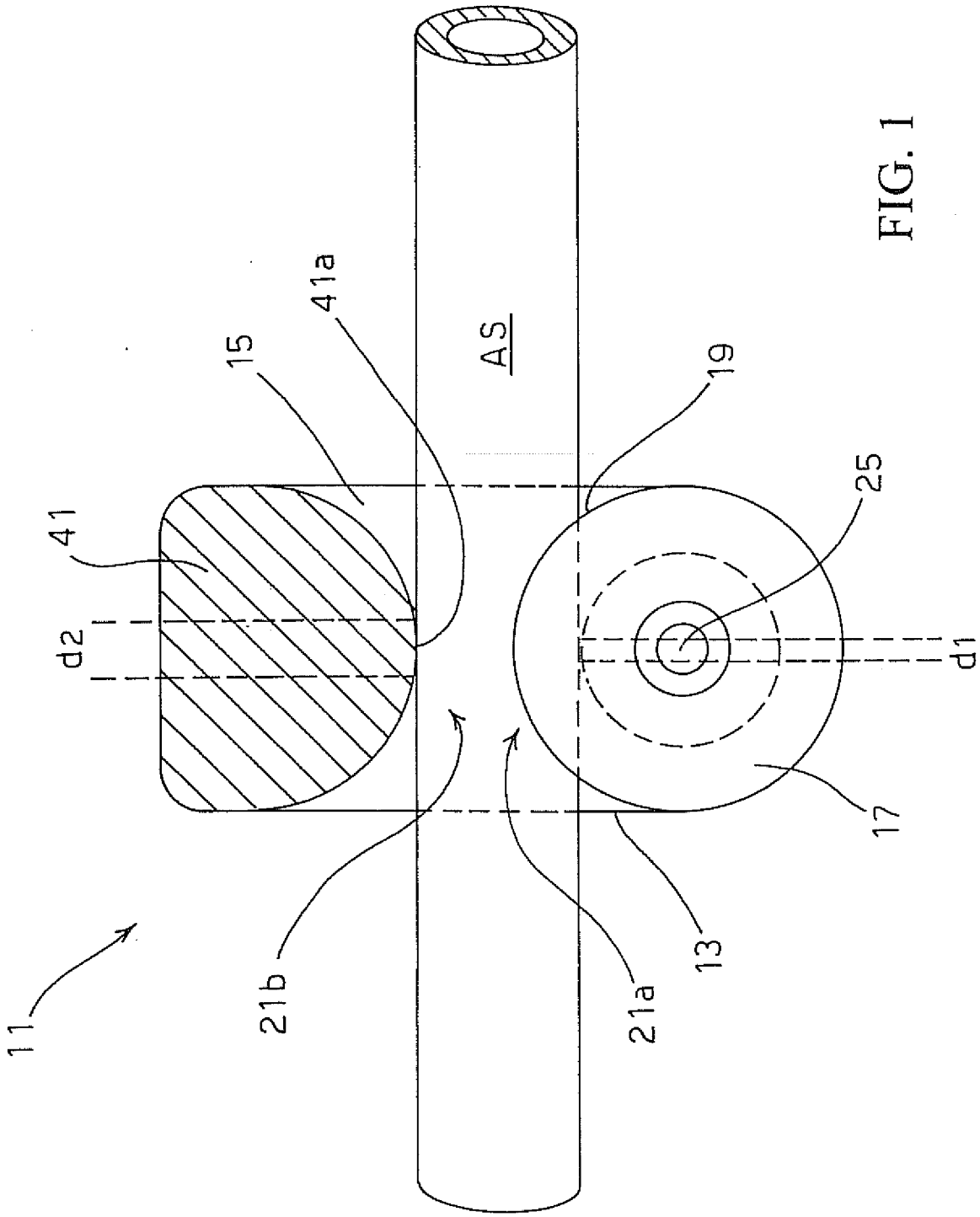


FIG. 1

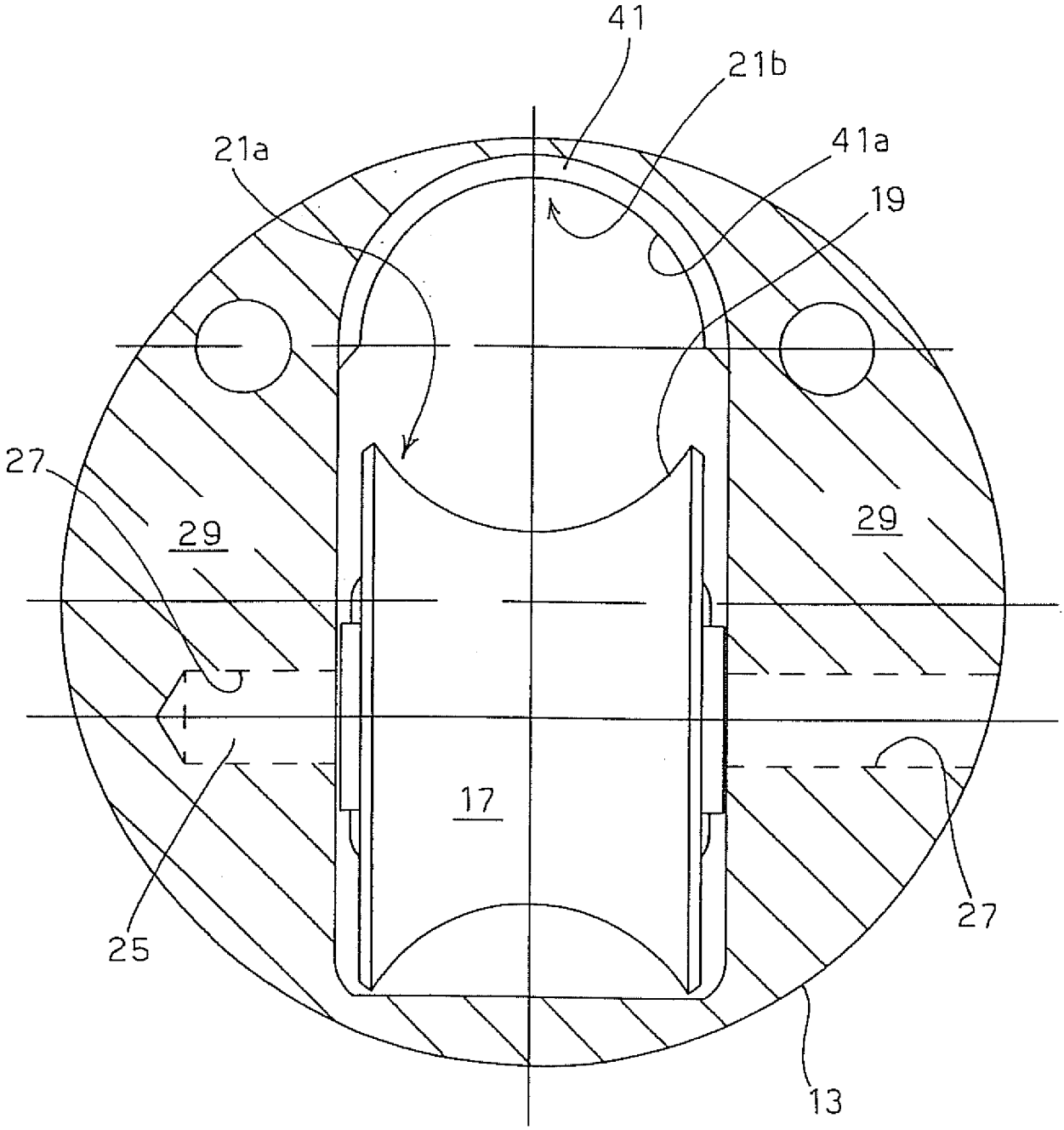


FIG. 2A

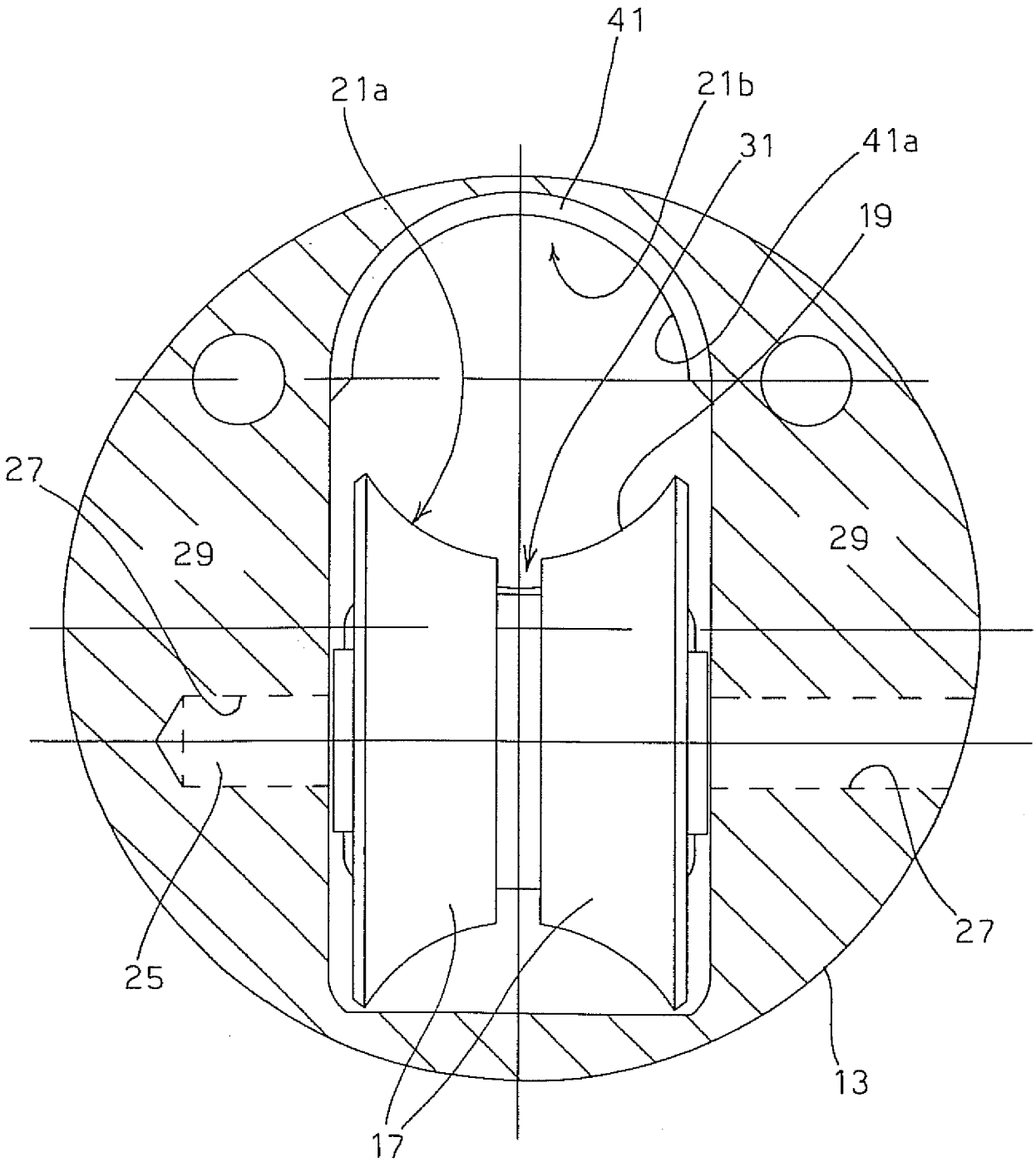


FIG. 2B

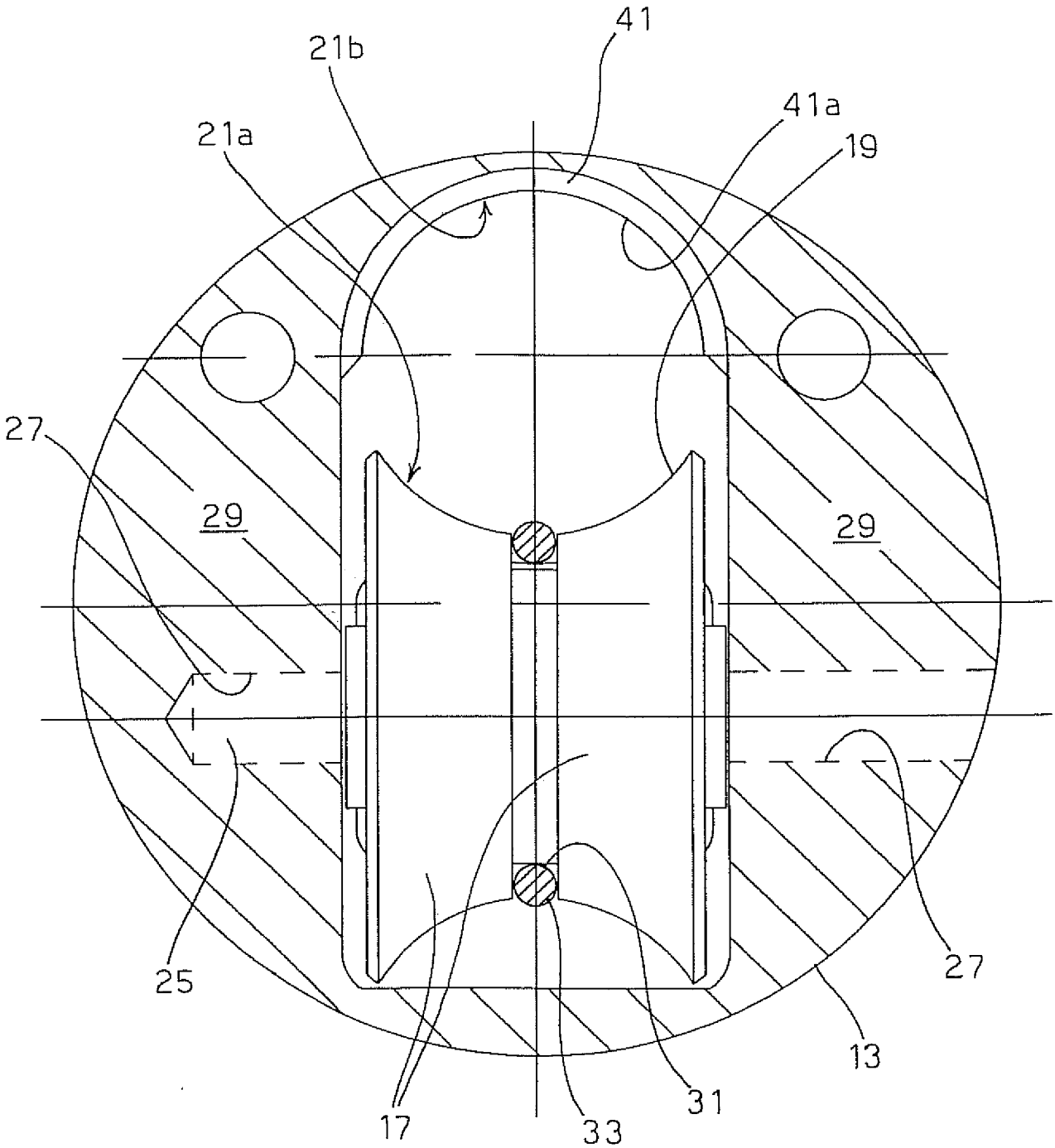


FIG. 2C

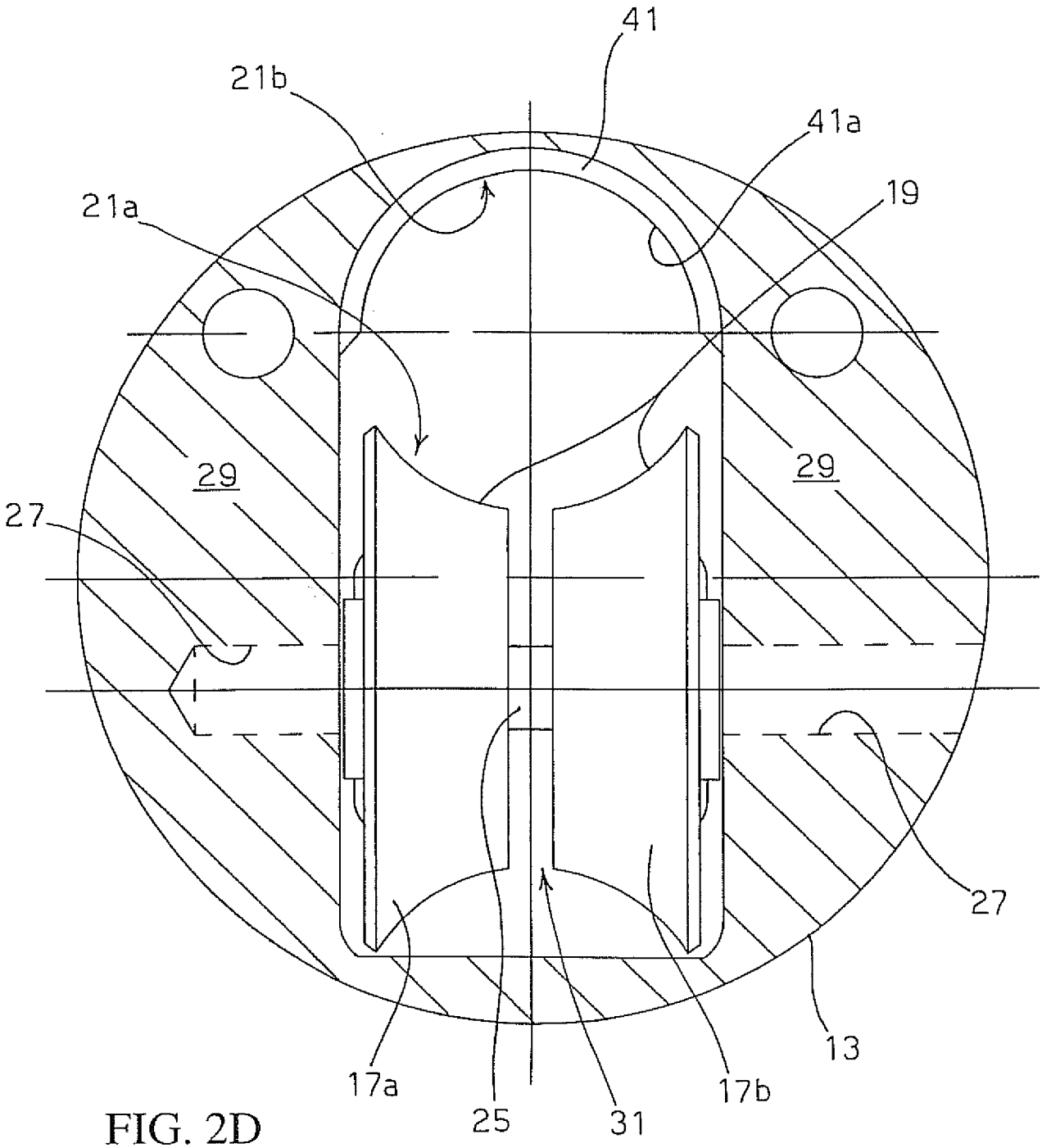


FIG. 2D

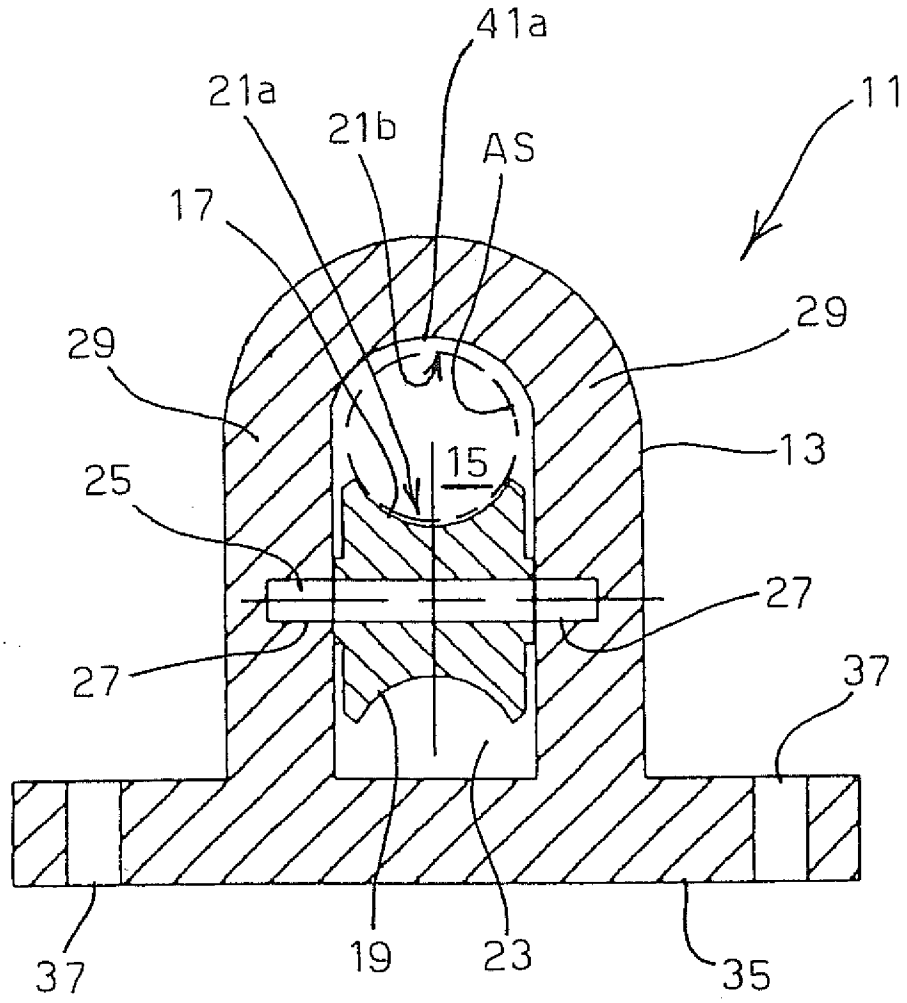


FIG. 3

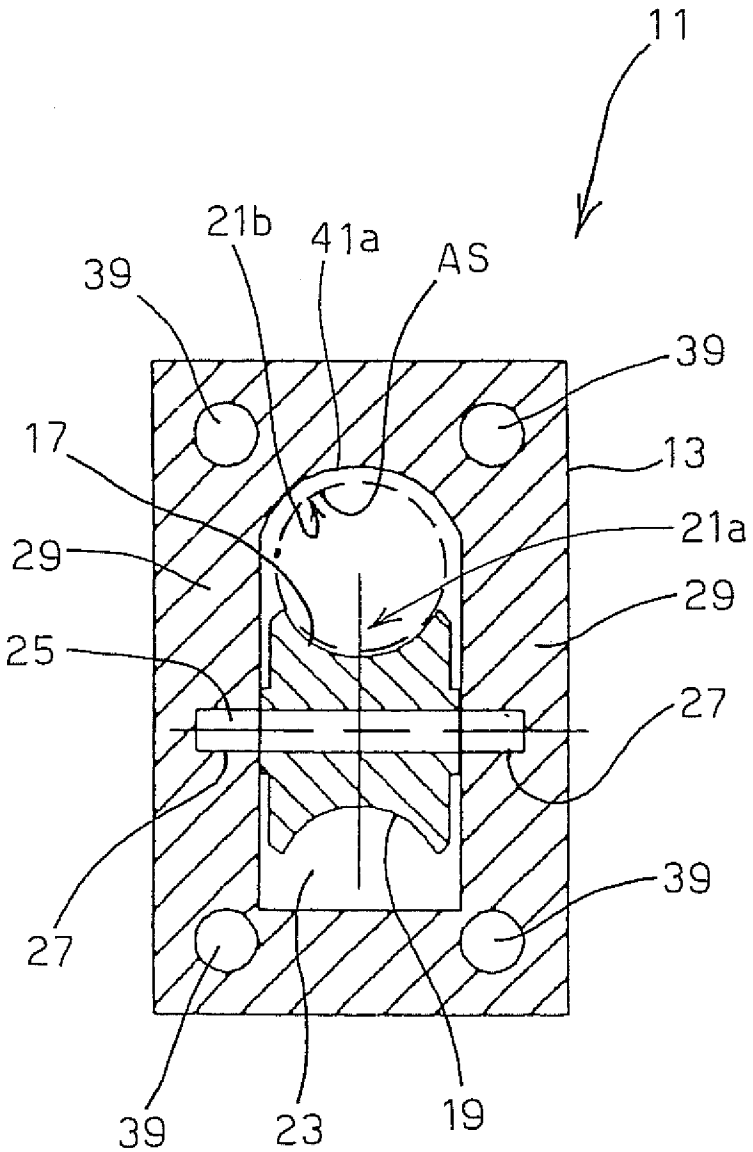


FIG. 4

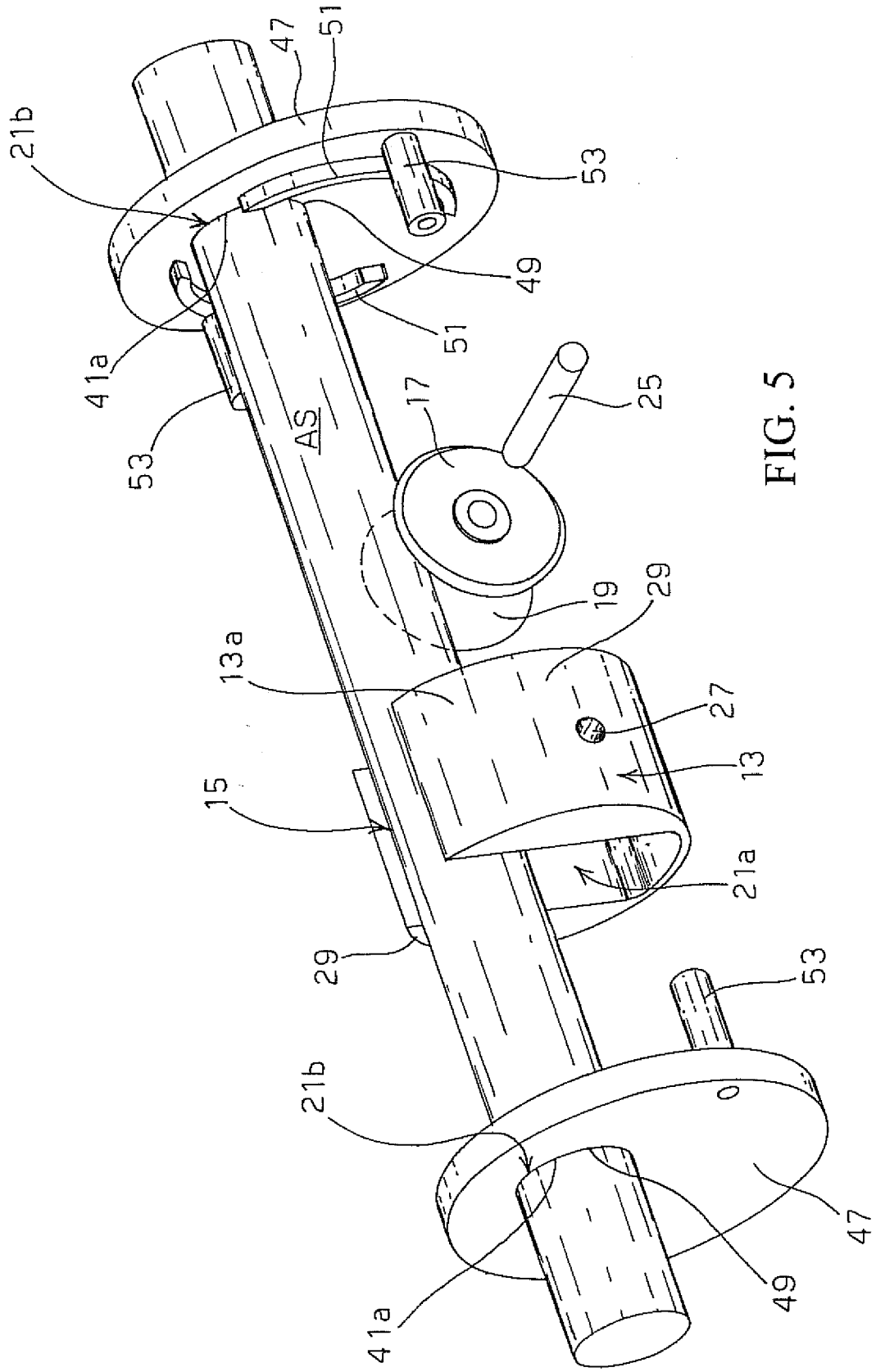
21b
47
51
53
49
41a
AS
17
25
19
29
13a
27
13
15
21a
29
53
21b
41a
49
47

FIG. 5

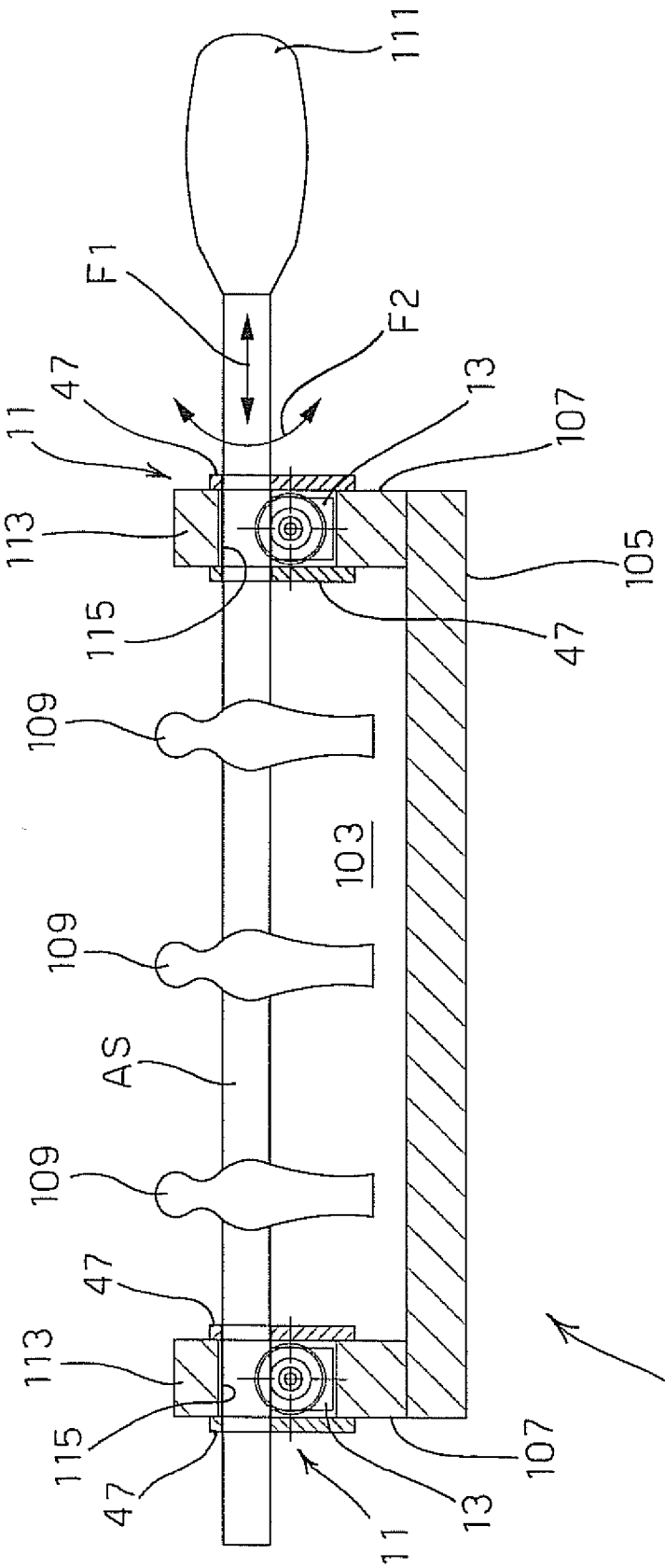
111
F1
F2
47
11
13
107
113
105
115
47
109
103
109
AS
109
47
113
115
47
11
13
107
101

FIG. 6

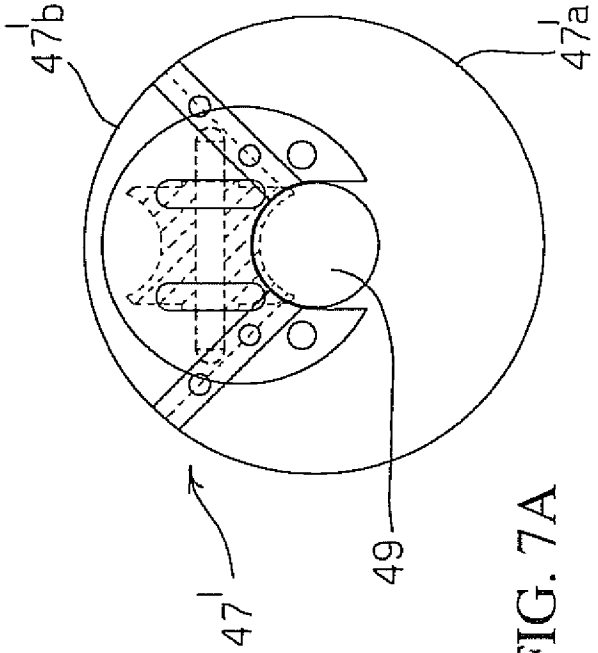


FIG. 7A

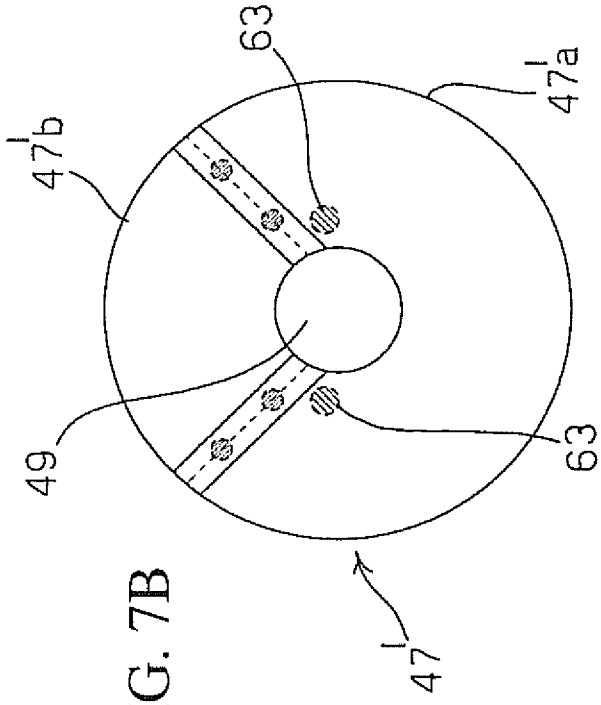


FIG. 7B

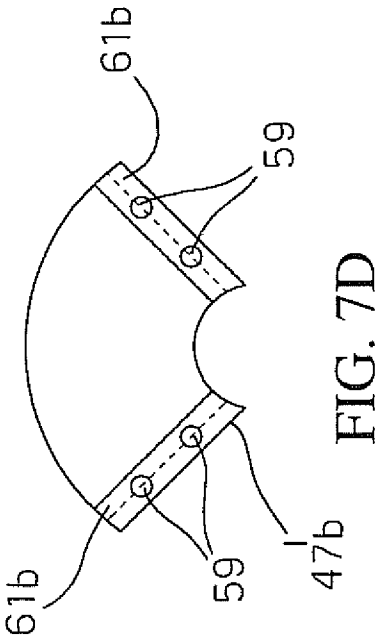


FIG. 7D

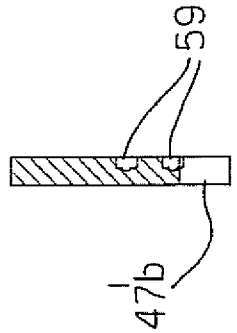


FIG. 7C

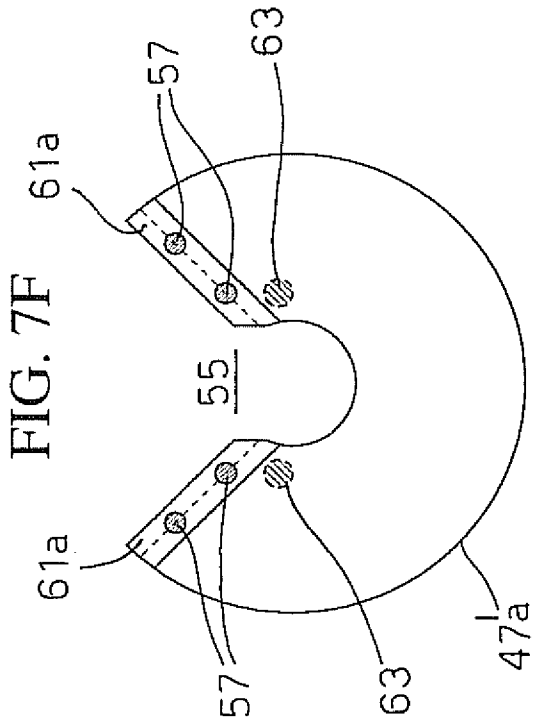


FIG. 7F

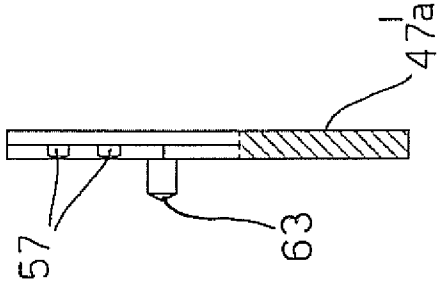


FIG. 7E

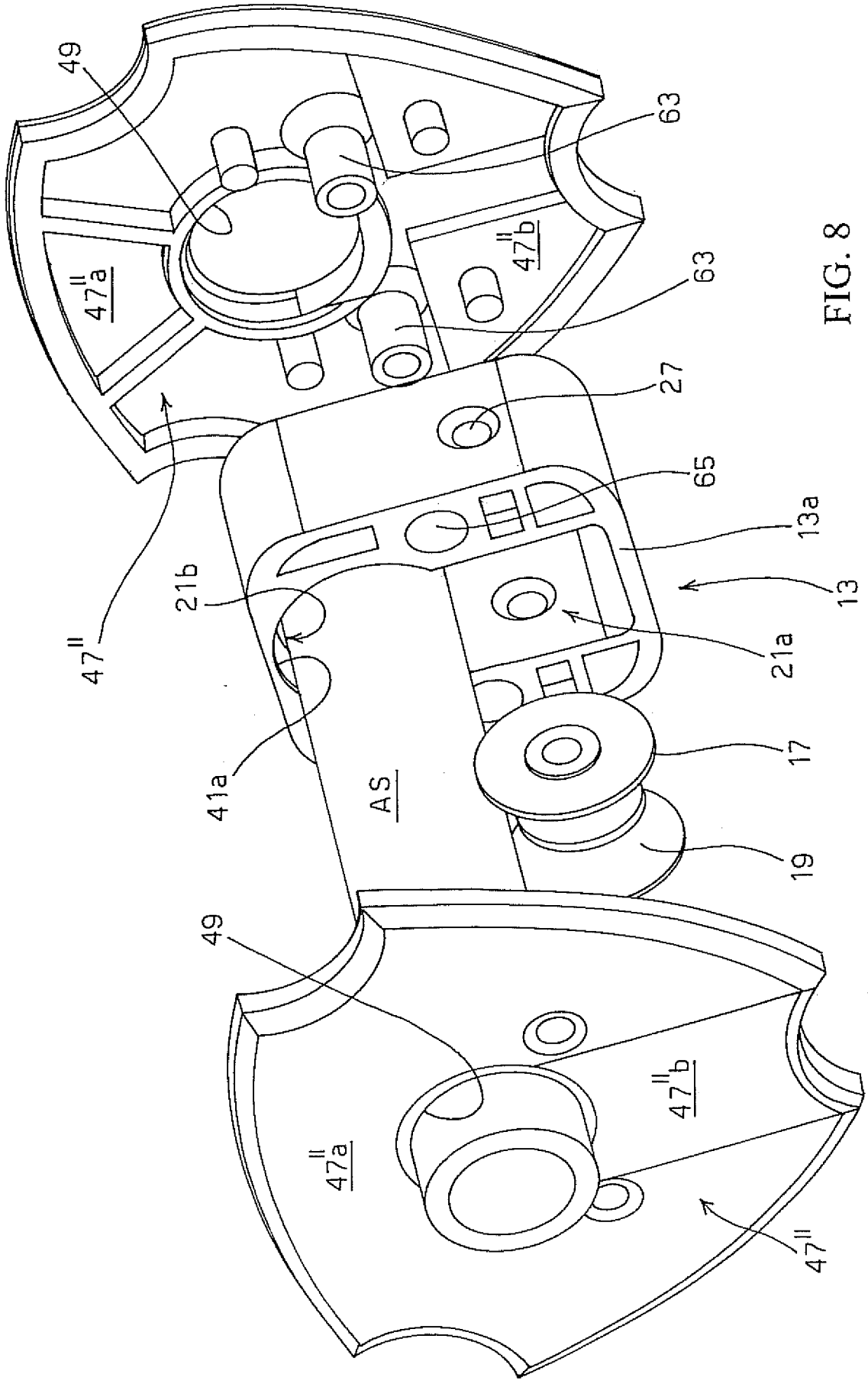


FIG. 8

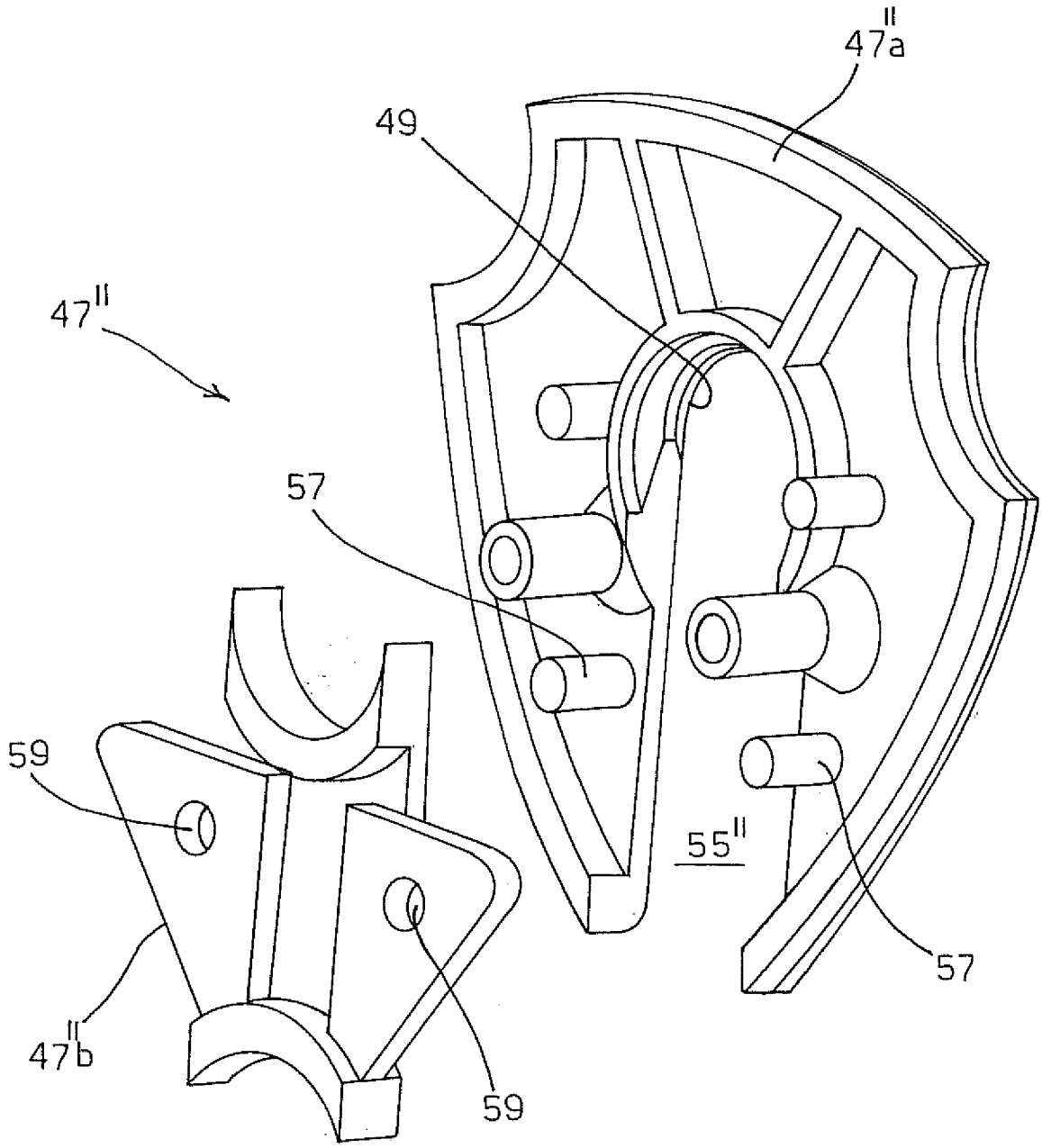


FIG. 9

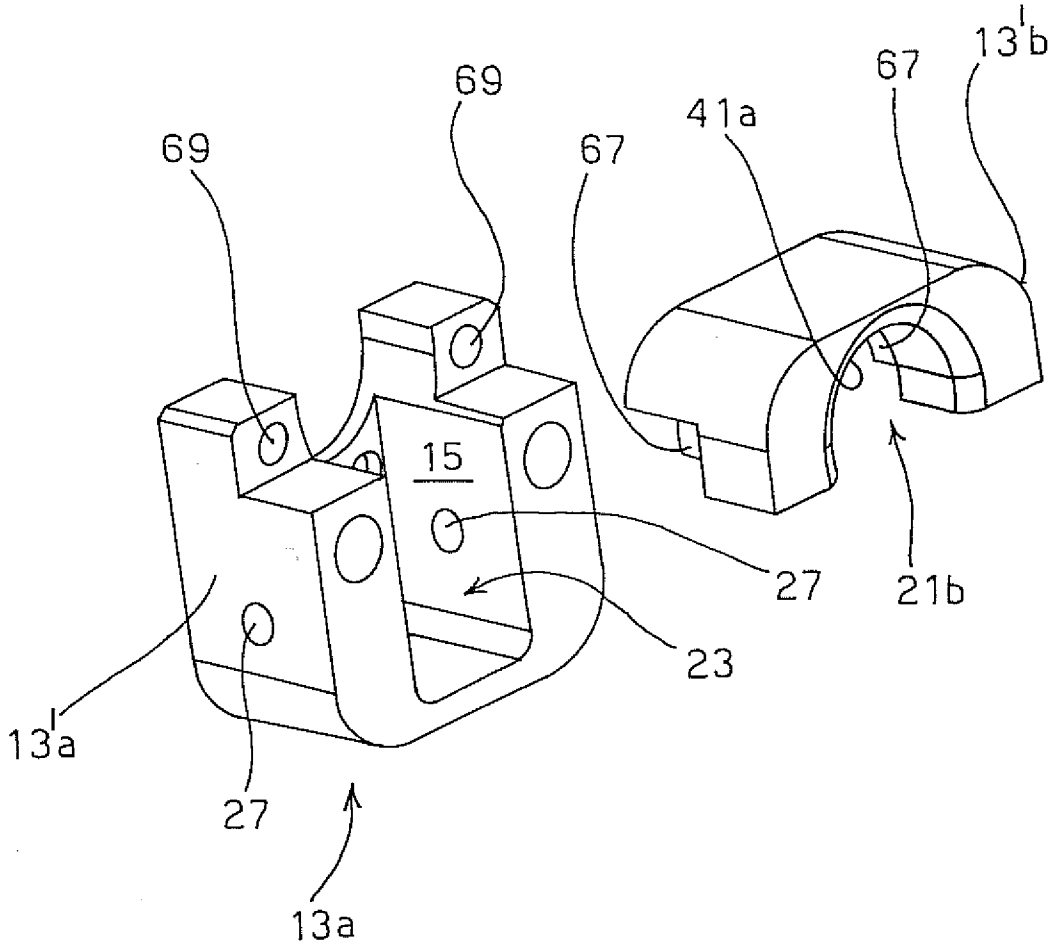


FIG. 10

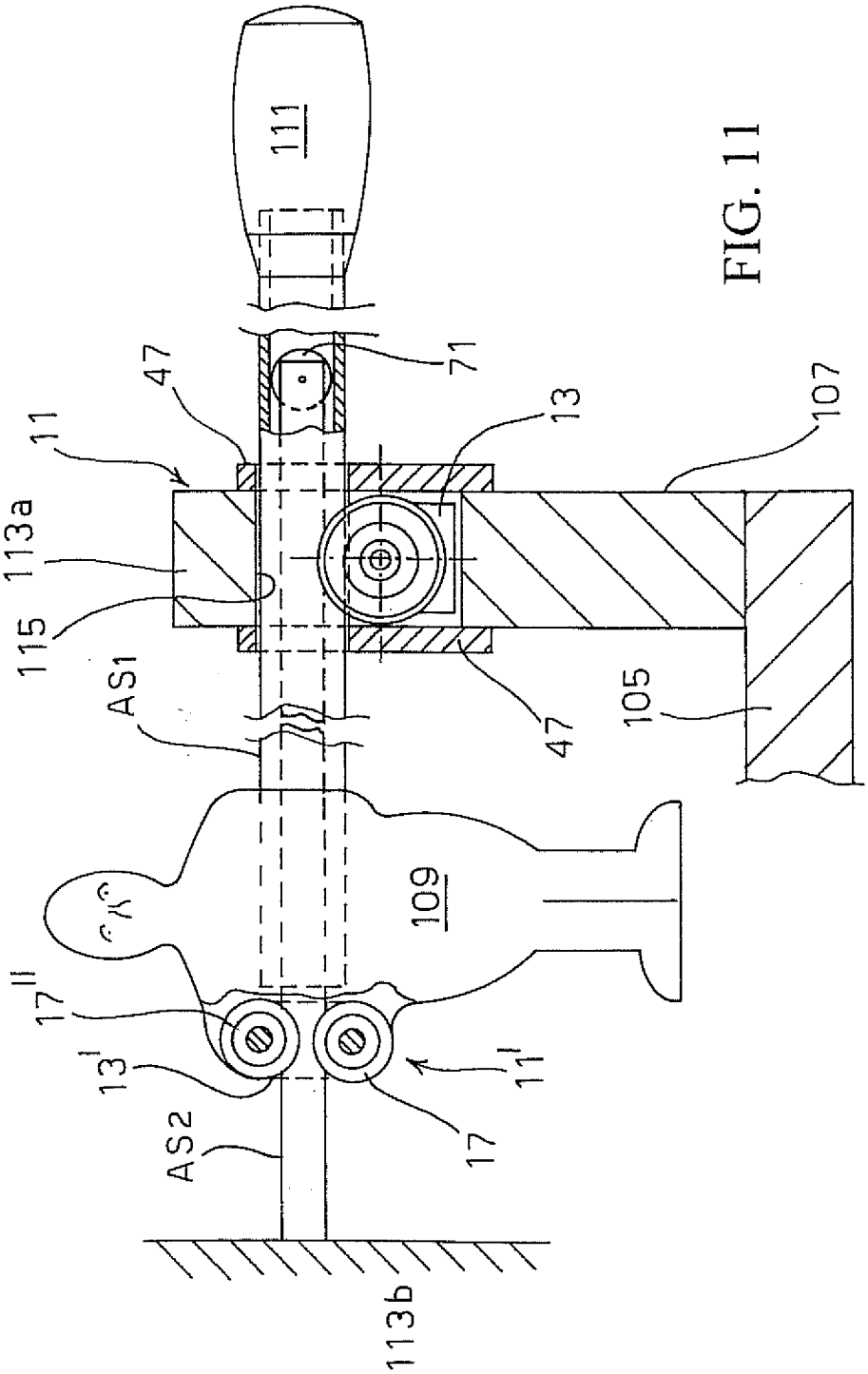


FIG. 11