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(54) An improved cleaning device.

(57) A cleaning device of the type known as cotton broom comprises an elongated handle, a supporting frame connected to said handle and a web (19) of fabric stretched over said supporting frame. The supporting frame is made up by three parts hinged together, that is two arms (1, 2) and a central member (3) provided with an attachment (9, 10) for a broomstick (48). Under working conditions the three parts (1, 2 and 3) maintain a coplanar relationship thanks to the mating of a number of portions having reduced thickness (30-31; 32-33; 34-35)and of snap means (4, 5). In order to wash, rinse or replace the fabric, the side arms (1, 2) that are hinged to the central flat member (3) are released from the snap means (4, 5) and rotate downward in such a way that the fabric (19) hangs loose and can be rinsed and squeezed.

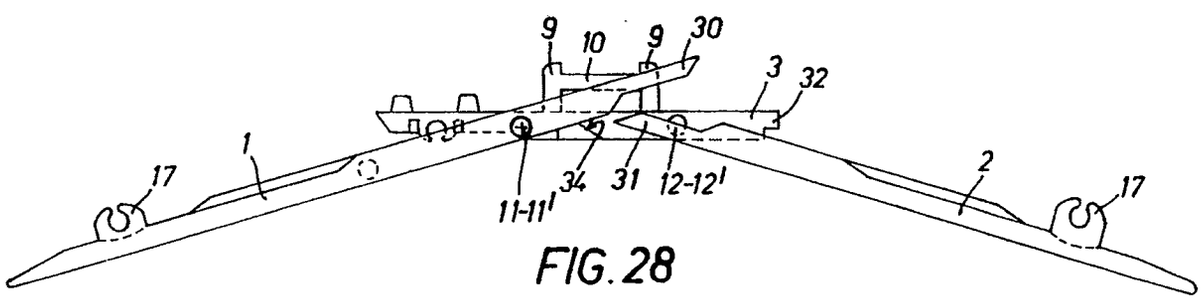

FIG. 28

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The present invention relates to improvements in the cleaning devices known as "cotton brooms".

A cleaning device of this type comprises an elongated handle, a supporting frame removably and pivotally connected to one end of said handle, and a web of fabric stretched over the supporting frame and kept taut which is used to clean surfaces such as floors and the like.

The cotton brooms presently sold are different from each other in respect of the construction of the supporting frame the surface of which can be made up by two or more cooperating portions, and in respect of the constraints keeping the parts (forming such surface) in a coplanar relationship during the operation thereof, or disengaging them from the coplanar configuration in order to allow for the assembly, the washing or disassembly of the fabric.

The known supporting frames for cotton brooms have a number of disadvantages in that they are of complex and costly construction, require several components some of which are metal parts, and are prone to jamming or breaking.

It is therefore an object of the present invention to realize an improved supporting frame of the type indicated above that eliminates or substantially overcomes the inconveniences of the known devices.

This object is achieved by a cleaning device comprising an elongated handle, a supporting frame removably and pivotally connected to one end of said handle, and a web of fabric stretched over said supporting frame, said supporting frame comprising two elongated members or arms and snap locking means to maintain said arms in a coplanar configuration and said fabric stretched thereon, characterized in that said supporting frame further comprises a central flat member equipped with an attachment for said handle, to which member said arms are pivotally connected, said two arms and central flat member being moulded from a plastic material.

Additional advantageous features are the objects of the dependent claims.

The solution proposed for the supporting frame according to the invention aims to obtain the maximum of functionality together with a simple construction and use, and at competitive costs.

The whole construction can be of a plastic resin material (included the pins) without any metal component.

The supporting frame is made up by three parts, hinged together, and more precisely, two side arms and a central flat member equipped with an attachment for the handle. The above parts are bound to be firmly maintained coplanar during the operation of the device, whereas they are released from the coplanar arrangement (so that the outer arms can get an angled position through a rotation about the pivot pins by which they are connected to the central flat member) when the "fabric" is to be washed, rinsed, squeezed or replaced.

A preferred and not limiting embodiment of the invention will be illustrated with reference to the attached drawings, in which:

Fig. 1 is a top view of a supporting frame for a cotton broom according to the invention;

Fig. 2 is a cross section view of the supporting frame of Fig. 1, along the line K-K;

Fig. 3 is a side view of the supporting frame of Fig. 1, along the line Z-Z;

Fig. 4 and Fig. 5 are a top view and a side view, respectively, of the pawl of the snap fitting means;

Figs. 6, 7 and 8 are plan views of the two arms and of the central flat member, respectively;

Fig. 9 is an enlarged plan view of one arm of the supporting frame;

Fig. 10 and Fig. 11 are cross section views along the lines K-K and Y-Y, respectively, of Fig. 9;

Fig. 12 and Fig. 13 are a plan view and a side view of the central flat member, respectively;

Fig. 14 is an enlarged plan view of the other arm of the supporting frame;

Fig. 15 and Fig. 16 are cross section views along the lines K-K and Z-Z, respectively, of Fig. 14;

Fig. 17 shows the whole supporting frame as seen from below;

Figs. 18 and 19 are upside-down views corresponding to Figs. 2 and 3;

Figs. 20, 21 and 22 illustrate the two arms and the central flat member, respectively, as seen from below;

Figs. 23, 24 and 25 illustrate the three parts making up the supporting frame;

Figs. 26 and 27 are a side view and a cross section view, respectively, of the supporting frame assembled together with the three component parts thereof in coplanar relationship;

Fig. 28 illustrates the supporting frame in an angled configuration;

Fig. 29 illustrates the supporting frame and the fabric tape hanging therefrom;

Fig. 30 illustrates a detail of the fabric anchoring means;

Figs. 31 and 32 show details of the fabric clamping means;

Fig. 33 is an exploded partial cross section view of the attachment for securing the broomstick to the cleaning device of the invention;

Fig. 34 is a partial side view of Fig. 33; and

Fig. 35 comprises three views illustrating a clip for preventing the disengagement of the broomstick.

With reference to the Figures, and particularly to Figures 1 to 11, the supporting frame of the invention comprises two elongated members or arms, 1 and 2 and a central flat member 3 that in use are assembled together. All the three members are formed by moulding of a suitable plastic material. As it is clearly shown in the drawings, the three members are adapted for a partial overlapping or mating, with the parts interpenetrating with each other thanks to proper thickness reductions.

The central member 3, as it is best seen in Figs. 12 and 13, is a generally rectangular flat body of plastic material provided with a first pair of outward protruding coaxial pivot pins 11-11 and with a second pair of outward protruding coaxial pivot pins 12-12 that are shorter than the former, all the pins being orthogonal to the longitudinal axis of the member. The portion of the body 3 carrying the pins 11-11 is wider than the portion carrying the pins 12-12.

On one face of the member 3 (the one facing upward when the device is in use) there are provided two parallel projections or ribs 8 and two shoulders 9 receiving an axis 10 for fitting an articulated device (Figs. 33-35) to be connected to the shaft of the broomstick.

The free end of the narrower portion provides for a strip 32 of reduced thickness, and two inclined side surfaces 34 are provided at about the middle of the member 3.

On the lower face of the flat member 3, approximately between the projections 8, there are provided at least a pair of aligned seats 5, formed as grooves with a circular cross section inner portion and a flared outer portion, adapted for snap engagement of circular cross section pins.

The flat member 3 is moulded as a single plastic piece simultaneously with all the above illustrated components.

As it is clearly shown in Figs. 9 - 11, the arm 1 has a general flat configuration with a central recess 7 on one face (the upper one when the device is in use) and two side extensions 29. A squared opening or window 13 is formed in the recess 7, approximately at the middle of the arm 1.

On the upper face, near one end of the arm 1 a pair of seats 17 are formed for a device that secures the fabric to the supporting frame, as will be illustrated with more details later. Also these seats are formed as grooves with a circular cross section inner portion and a flared outer portion and are adapted to receive pins through plastic deformation.

Arm 1 is further provided with at least a pair of pins 4 located in the recesss 7 and adapted to cooperate and engage with the above mentioned seats 5 of the member 3 to form a snap connection or clip constraint.

A transverse pin 6 extends within the recess 7, in correspondence of the window 13, and a pair of seats 11'-11' are formed in the extensions 29. Such seats are formed as grooves with a circular cross section inner portion and a flared outer portion and are adapted to receive the above mentioned pivot pins 11, 11 of the central flat member 3.

The ends 30 of the extensions 29 are of reduced thickness and cooperates with similar ends 31 of the arm 2 to form abutment means as will be illustrated later.

With particular reference to Figs. 14-16, the arm 2 has a general flat configuration with two side extensions 28. On the face that is the upper one when the device is in use, near one end thereof, a pair of seats 17 are formed that are similar and for the same purpose of those provided on the arm 1.

A pair of seats 12'-12' are formed in the extensions 28. Such seats are formed as grooves with a circular cross section inner portion and a flared outer portion and are adapted to receive the above mentioned pivot pins 12, 12 of the central flat member 3.

Two side portions 31 of the extensions 28 are of reduced thickness and cooperates with the corresponding portions 30 of the arm 1 to form abutment means. Further two inclined surfaces 35 are provided for at the end of the extensions 28 for cooperating with the above mentioned two inclined side surfaces 34 of member 3. Finally, a step portion 33 is provided between the extensions 28 to abut the strip 32 of reduced thickness of the member 3.

The coplanar configuration of the supporting frame will now be illustrated.

When the clip or snap connection is engaged it can be assumed that the above arm 1 is rigidly integral with the central flat member 3. Just before becoming rigidly integral with the central flat member 3, the extensions 30 of the arm 1 crosses and overlaps the reduced thickness areas 31 of the arm 2 which is already in coplanar relationship with the central flat member 3. This overlapping or abutment of surfaces 30-31 occurs fully when the above mentioned clip engagement completely takes place so that there is formed a constraint for the arm 2 preventing the possibility of this latter to be inclined with respect to the central flat member 3. The three parts 1, 2 and 3 are coplanar with each other and mutually bound together.

The device of the invention further comprises a member for the quick release of the snap connection 4-5. This member is in form of a pawl 14-15, illustrated in Figs. 4 and 5, is shaped like a lever and received in the reduced thickness portion 7 and in the window 13. The pawl is pivoted in correspondence of an intermediate fulcrum, at 16, to the transverse pin 6 of the arm 1. When the user

pushes on portion 15 with his/her foot, the central flat member 3 is raised from the snap engagement and the assembly collapses so that the fabric is no longer stretched by the supporting frame.

The collapsing of the supporting frame will now be described.

Upon acting onto the pawl 14-15, the arm 1 ceases to be rigidly integral with the central flat member 3, and at the same time ceases the action of the extensions 30 upon the reduced thickness areas 31 of the arm 2. The arm 2, and the arm 1 too after the central flat member 3 has been raised, can rotate about their pivot pins 11, 11 and 12, 12.

The positioning of the pins 11, 11 and 12, 12 and the length of the portions of both arms 1 and 2 extending beyond their own pins are chosen in such a manner that when switching from the coplanar position to the angled one and viceversa, there are prevented jamming or mutual encroachment that might lead to a breaking of the supporting frame structure.

Fig. 28 illustrates a partially collapsed configuration in which after the release of snap coupling 4-5, the arms 1 and 2 hinged at 11 and 12 to the central flat member 3 assume an angled position, and can be further rotated to reach the configuration shown in Fig. 29. As shown in such Figure, the central flat member 3 is raised from the floor so that the arms 1 and 2 drop into a vertical position, and the fabric 19 secured by tapes 18 to clamping means at the ends of arms 1 and 2, hangs loose and can be washed, squeezed and rinsed, or replaced if necessary.

To return the assembly into the coplanar configuration, a rotation α is applied to the flat member 3 so that the ends of the arms 1 and 2 tend to open due to the centrifugal force. By lowering the supporting frame against the floor during this operation, the positioning into a coplanar relationship of the arms 1 and 2 together with the flat member 3 is made easier. Then the user actuates the snap connection by pushing onto the projections or ribs 8 with his/her foot thus forcing the seats 5 into engagement with the pivot pins 4.

Figs. 30-32 illustrate the construction of the means for clamping the fabric 19 to the supporting structure. Such means comprises a plate 21 located under a two-arm eccentric lever 20 pivotally mounted between the seats 17. A tape 18 provided at each end of the fabric 19 is led under the plate 21 and tensioned by pressing the eccentric lever 20. The plate 21 prevents any displacement of the fabric, allowing only the fabric compression during the use of the cleaning device.

Fig. 33 is an exploded partial cross section view of the attachment for securing the broomstick 48 to the flat central member 3, whereas Fig. 34 is a partial side view of Fig. 33. The attachment comprises a forked member 40 gripping with the seat 43 the shaft 10 that is carried by the flat member 3.

The forked tip 44 of the broomstick holder 46 engages a pin 41 in the member 40 and the broomstick 48 is received and blocked in the holder thanks to a threaded bush 47 that is screwed on the externally threaded holder 46 acting as a chuck-wise conical clamping.

To prevent the disengagement from and the rotation of the broomstick within the receiving seat, according to the invention, the conventional metal screw and nut are replaced by a plastic moulded clip 50-51 which is better illustrated in the three views constituting Fig. 35. Such component is a single piece shaped like an interrupted ring portion or annulus 50 with a diametrally extending pin 51 that passes through both the holder 46 and the broomstick 48, both provided with through holes 52 and 49. The pin 51 acts like a peg and the ring portion 50 prevents the pin 51 from coming out from the broomstick.

Claims

1. A cleaning device comprising an elongated handle, a supporting frame removably and pivotally connected to one end of said handle, and a web of fabric stretched over said supporting frame, said supporting frame comprising two elongated members or arms and snap locking means to maintain said arms in a coplanar configuration and said fabric stretched thereon,

   characterized in that

   said supporting frame further comprises a central flat member (3) equipped with an attachment for said handle (48), to which member (3) said arms (1, 2) are pivotally connected, said two arms (1, 2) and central flat member (3) being moulded from a plastic material.

2. A cleaning device as claimed in claim 1, characterized in that the first (1) of said arms is provided with two side extensions (29) with ends (30) of reduced thickness and with at least a pair of inwardly projecting pins (4), and that the second (2) of said arms is provided with two extensions (28) with side portions (31) of reduced thickness and adapted to cooperate with the ends (30) of said first arm (1) to form abutment means when the supporting frame (1, 2, 3) is in the coplanar configuration.

3. A cleaning device as claimed in claim 1 or 2, characterized in that said central flat member (3) is provided with a first pair of outward protruding coaxial pivot pins (11, 11) and with

a second pair of shorter outward protruding coaxial pivot pins (12, 12), all such pins being orthogonal to the longitudinal axis of the flat member (3), and in that said member (3) is further provided with at least a pair of aligned seats (5), adapted to engage the above mentioned pins (4) of said first arm (1) to form at least one snap connection or clip constraint, thus achieving the stability of the coplanar relationship.

4. A cleaning device as claimed in claim 3, characterized in that said first arm (1) has a general flat configuration with a central recess (7) and a squared window (13) formed in said recess (7) approximately in the middle thereof.

5. A cleaning device as claimed in claim 4, characterized in that said central flat member (3) further comprises a transverse pin (6) extending within said recess (7), in correspondence of said window (13), and two inclined side surfaces (34) about at the middle of said central flat member (3).

6. A cleaning device as claimed in claim 5, characterized in that the second (2) of said arms has a general flat configuration with a pair of seats (12',12') formed in said extensions (28) adapted to receive the above mentioned pivot pins (12, 12) of the central flat member (3), said second arm (2) further comprising two inclined surfaces (35) at the end of said extensions (28) cooperating in abutment relationship with the above mentioned two inclined side surfaces (34) of member (3) when the supporting frame (1, 2, 3) is in the coplanar configuration.

7. A cleaning device as claimed in claim 6, characterized in that said central flat member (3) is provided with a strip (32) of reduced thickness, forming a step at one end thereof, and in that said second arm (2) is provided with a step portion (33) between said extensions (28) for the abutting engagement with said strip (32) of reduced thickness of the member 3 when the supporting frame (1, 2, 3) is in the coplanar configuration.

8. A cleaning device as claimed in claim 7, characterized in that said first arm (1) provides for a pawl (14, 15) shaped like a lever with an intermediate fulcrum (at 16), received in said reduced thickness portion (7) and window (13) and hinged about said pivot pin (6), the pawl (14, 15) releasing the snap connection (4, 5) when pressed on a portion (15) thereof by the user's foot.

9. A cleaning device as claimed in the preceding claims, characterized in that each of said arms (1, 2) is provided with projections having seats (17) for the application of an eccentric lever (20) for gripping an extension (18) of the active fabric (19), keeping the fabric ends bound to the arms (1, 2) of the collapsed frame, thus allowing for the rinsing and the squeezing of the above mentioned active part when the fabric (19) is no longer stretched by the supporting frame.

10. A cleaning device as claimed in claim 9, characterized in that said eccentric lever (20) acts on an interposed plate (21) that can only be lowered and not be translated, instead of acting directly on the fabric (19).

11. A cleaning device as claimed in claim 10, characterized in that all the pins and the respective seats are integrally formed when moulding the arms and the central member, and are part thereof.

12. A cleaning device as claimed in claim 11, characterized in that said seats (5, 11', 12', 17) are formed as grooves with a circular cross section inner portion and a flared outer portion so that the respective pins penetrate the seats and are snap coupled after overcoming an initial interference.

13. A cleaning device as claimed in claim 9, characterized in that the attachment for securing the broomstick (48) to the flat central member (3) comprises a a forked member (40) gripping with its seat (43) the shaft (10) carried by the flat member (3), and a forked tip (44) receiving the broomstick (48) and engaging a pin (41) in said forked member (40), and a threaded bush (47) that is screwed on said holder (46) and acting as a chuck-wise conical clamping.

14. A cleaning device as claimed in claim 13, characterized in that there is provided a plastic moulded clip formed as a single piece shaped like an interrupted ring portion (50) with a diametrally extending pin (51) that passes through both the said holder (46) and broomstick (48).

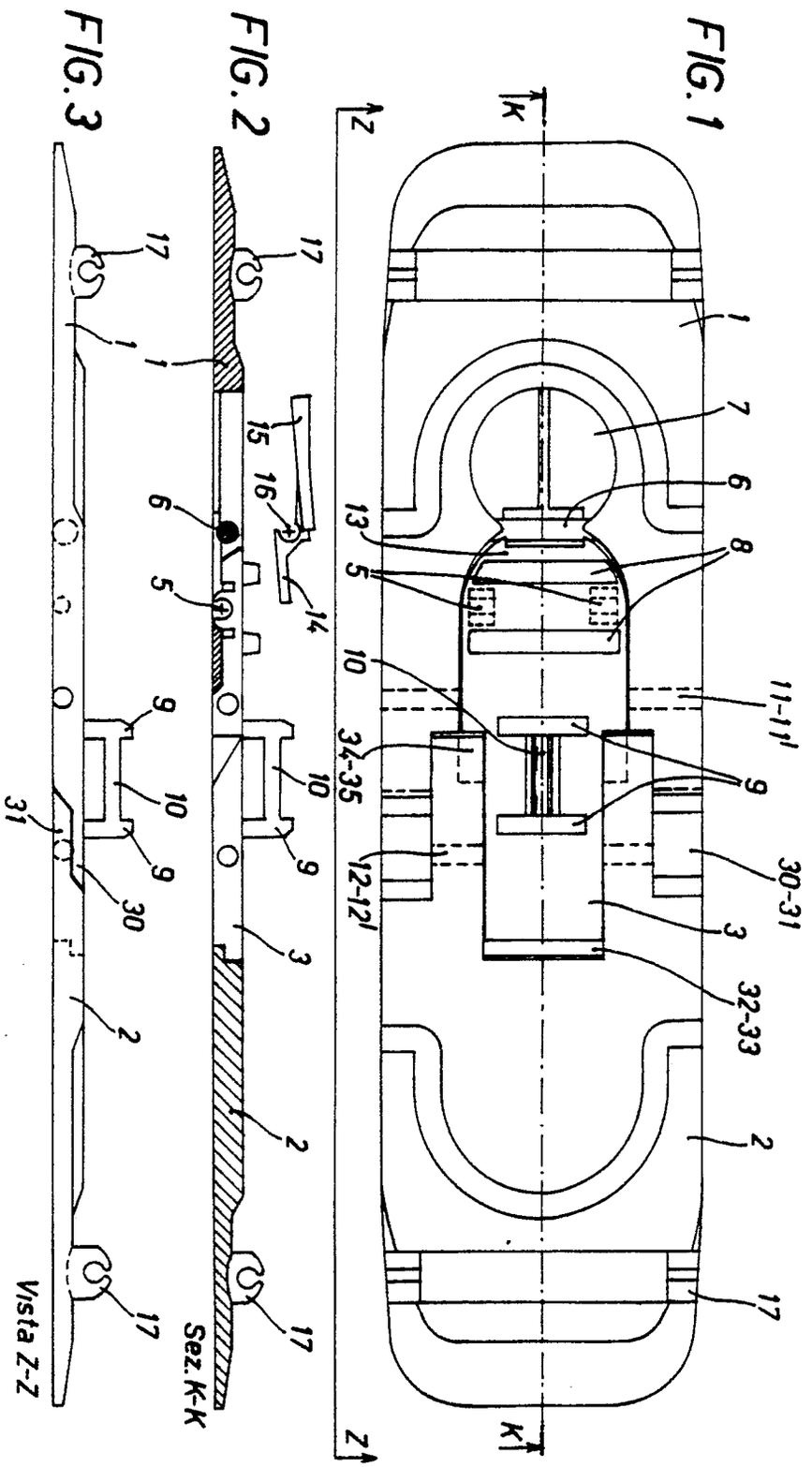


FIG. 1
FIG. 2
FIG. 3
Vista Z-Z
Sez K-K
K
Z
1
2
3
5
6
7
8
9
10
11-11'
12-12'
13
14
15
16
17
30
30-31
31
32-33
34-35

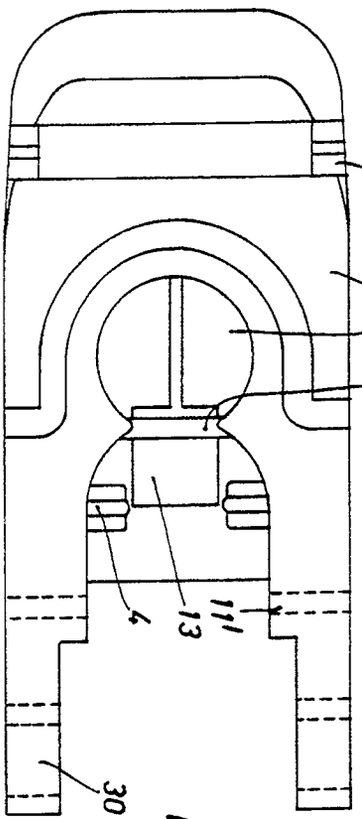


FIG.7

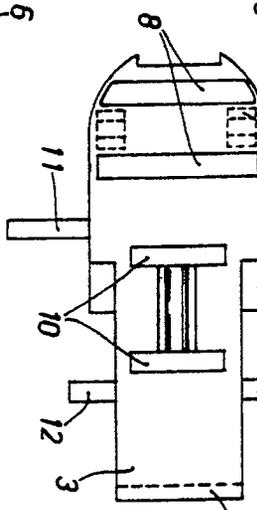


FIG.8

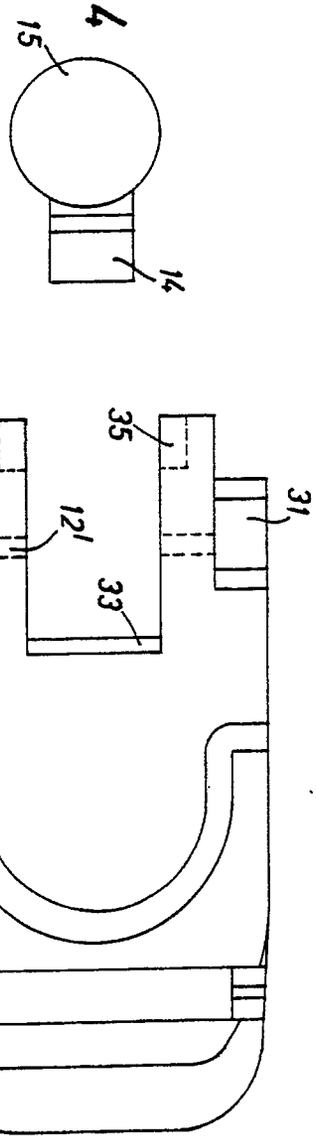


FIG.6

FIG.4

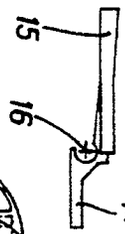


FIG.5

FIG.9

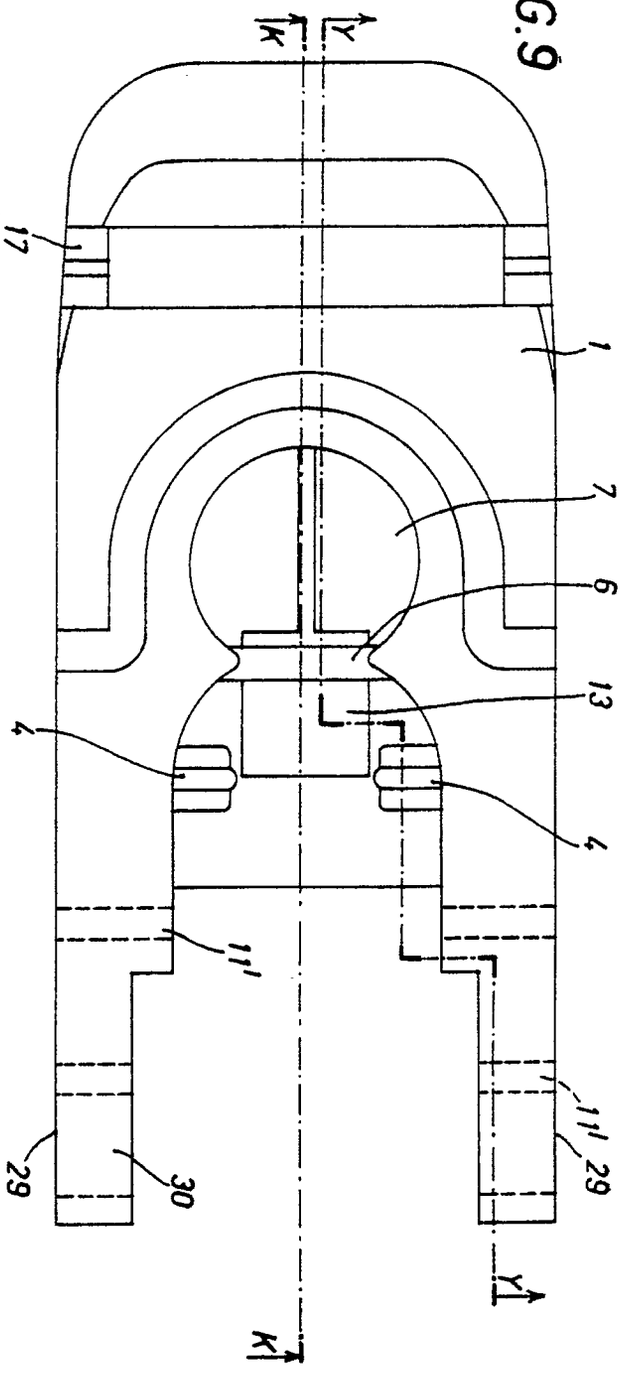


FIG.10

FIG.11

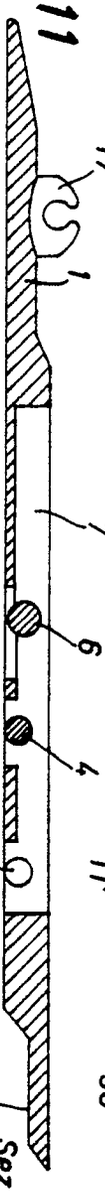


FIG.12

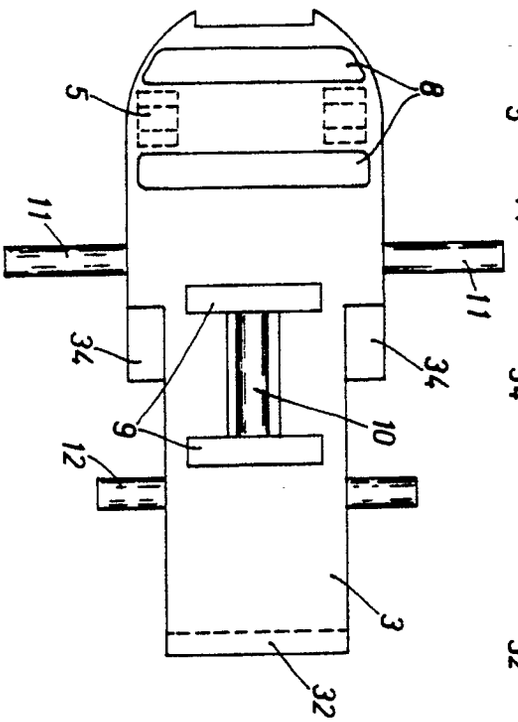
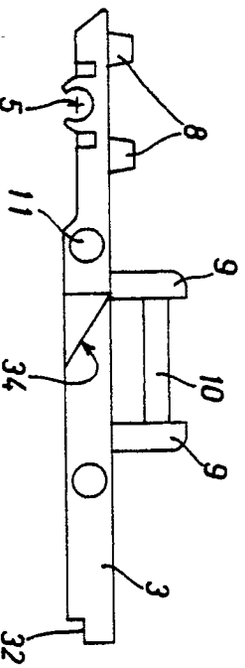


FIG.13



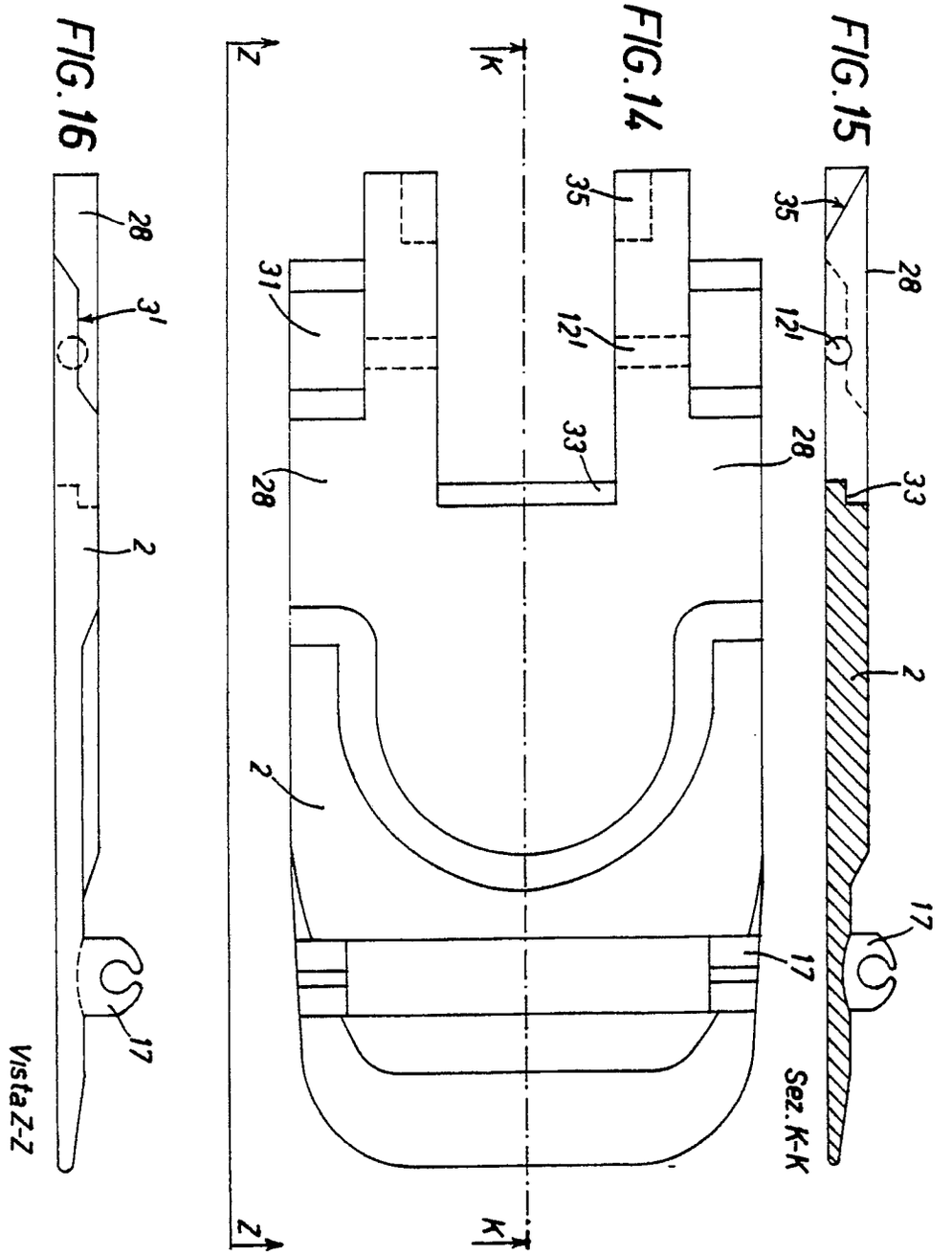


FIG. 15
35
28
121
33
2
17
Sez. K-K
FIG. 14
35
31
121
33
28
28
2
17
K
K
Z
Z
FIG. 16
28
3'
2
17
Vista Z-Z

FIG.17

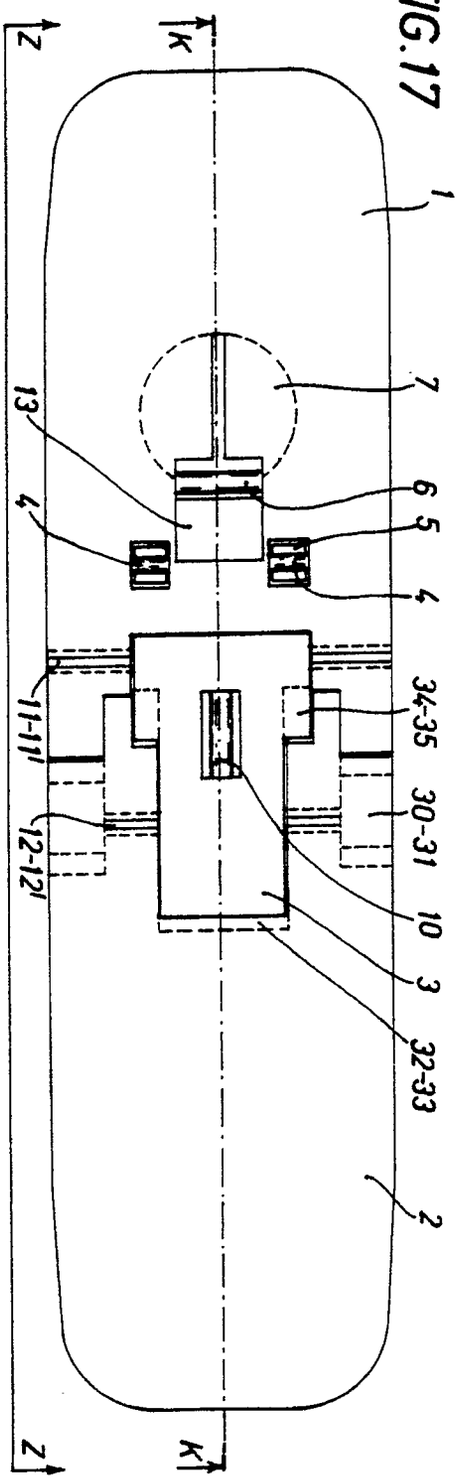


FIG.18

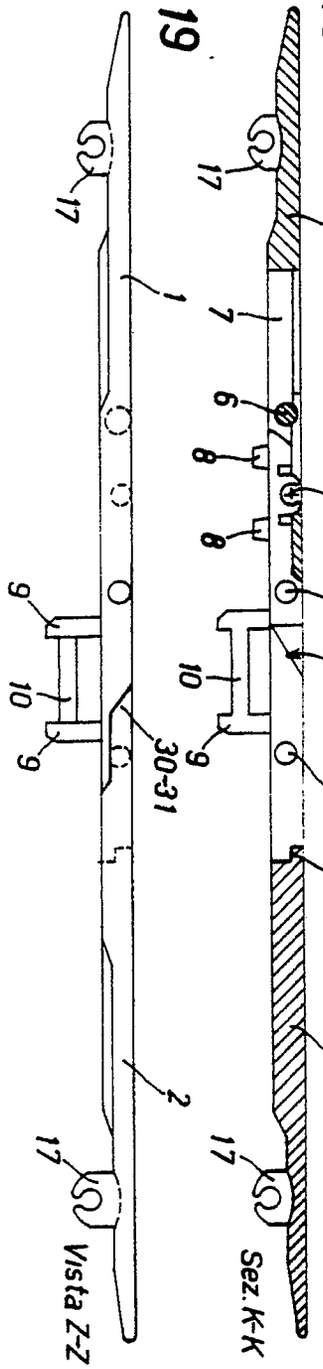


FIG.19

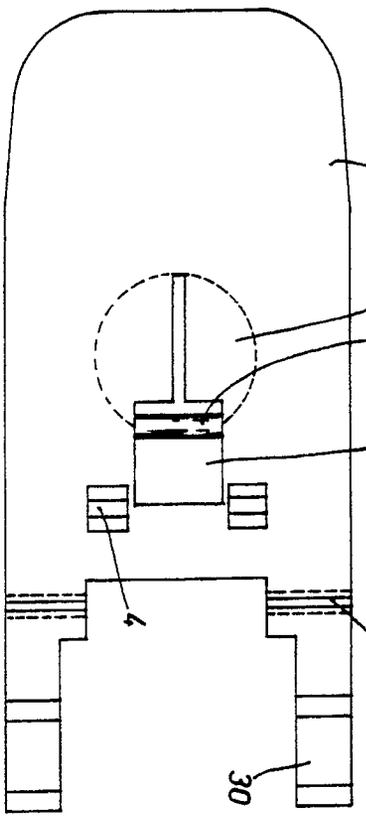


FIG. 21

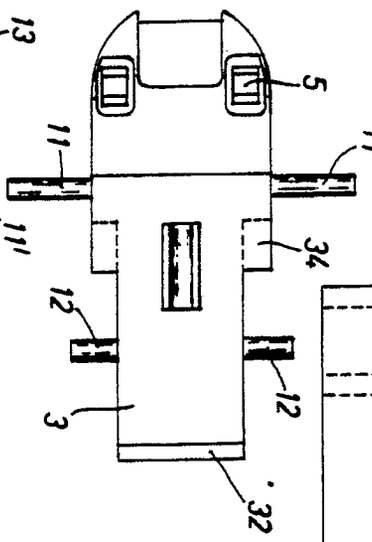


FIG. 22

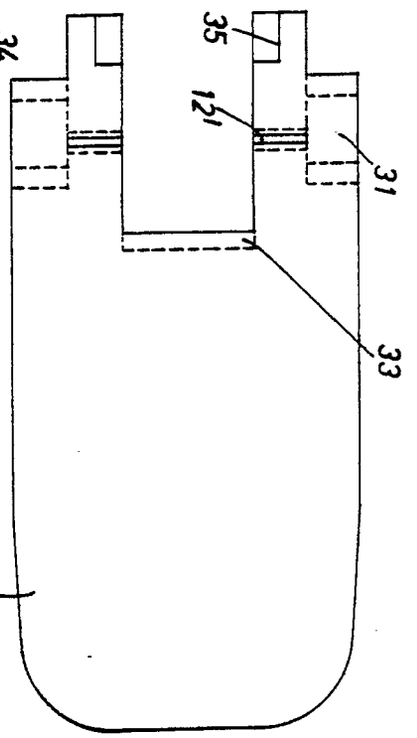


FIG. 20

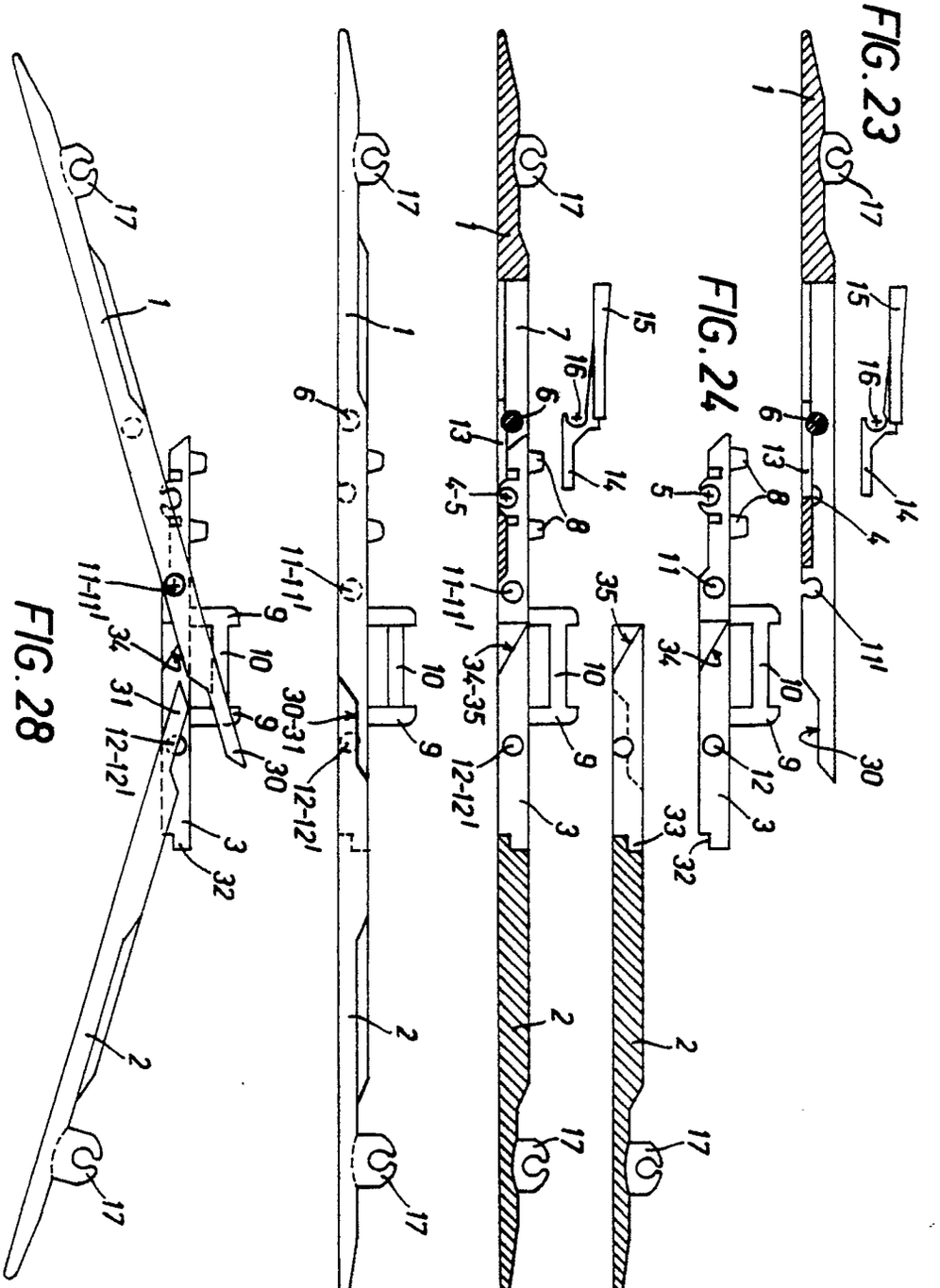


FIG. 23

FIG. 24

FIG. 25

FIG. 26

FIG. 27

FIG. 28

FIG. 29

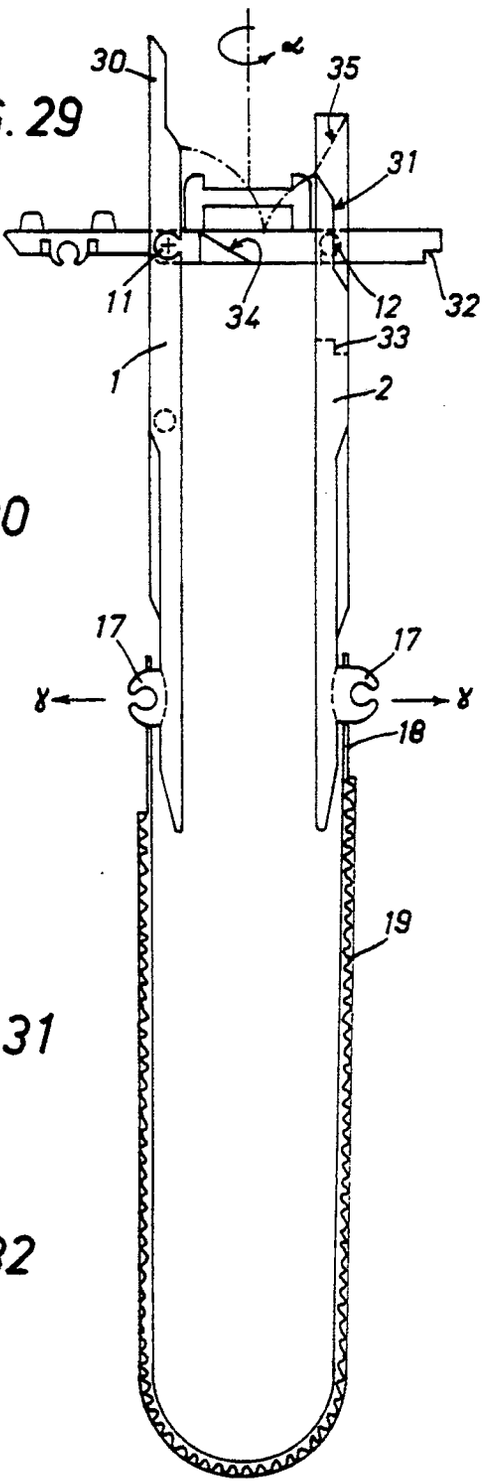
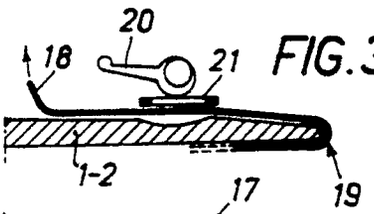


FIG. 30



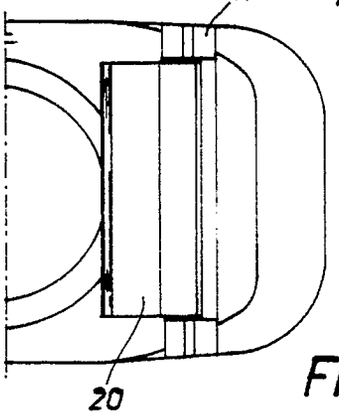
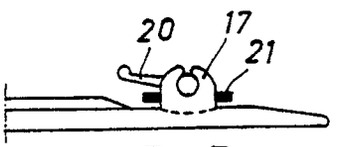


FIG. 31



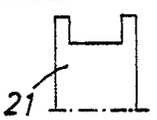


FIG. 32

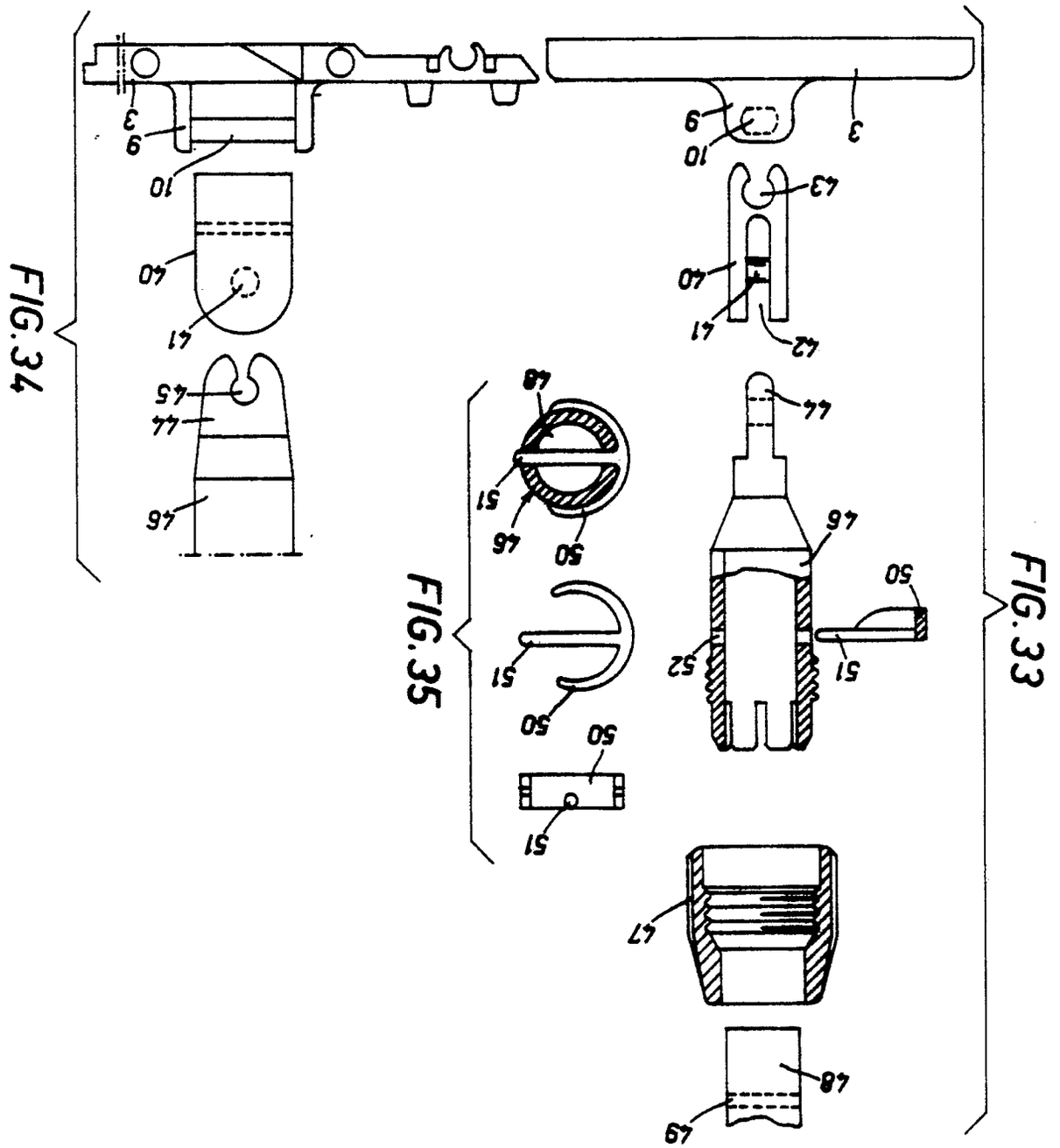


FIG.34
FIG.35
FIG.33