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## (54) 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 of fabric stretched over said supporting frame. The supporting frame comprises two elongated members or arms (1, 2) of plastic material and coupled together by snap fitting thanks to pivot pins (3, 4) and pivot seats (11, 5) integer with the arms. A plastic pawl (14-16) is pivotally connected to one (1) of the arms and is adapted to cause the collapsing of the supporting frame from the coplanar rigid configuration.

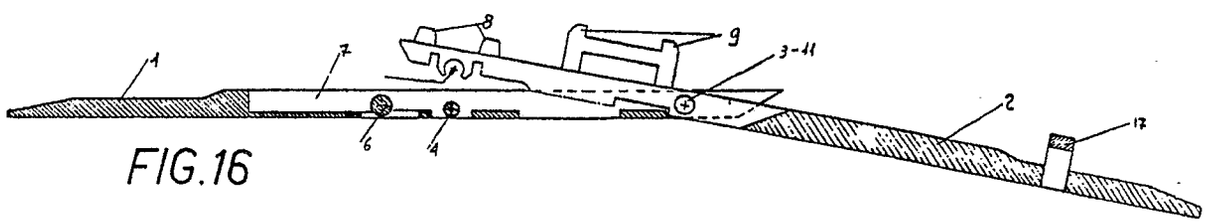


FIG.16

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# AN IMPROVED CLEANING DEVICE.

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 an end of said handle, and a web of fabric stretched over said supporting frame and kept taut which is used to clean surfaces such as floors and the like.

In these devices the supporting frame is collapsable or otherwhise adapted to be at least partially dismounted.

More particularly, the supporting frame generally comprises an assembly of suitably linked components adapted to assume a generally coplanar configuration in which the fabric web is stretched, and a collapsed or angled configuration in which the components are still joined together but not forming a rigid frame so that the fabric web can be easily washed, rinsed or replaced.

The fabric web (or cotton cloth) is generally provided with two opposed pockets or engagement cavities into which are fitted the ends of the supporting frame.

The known cotton brooms are different from each other in respect to the construction of the supporting frame keeping taut the fabric in the cleaning operations.

This frame must allow for an easy and quick assembly and disassembly to wash the fabric web and to replace the same when it is worn out.

Several types of supporting frames have been suggested that were not fully satisfactory in view of drawbacks concerning either the manufacturing costs or the effectiveness of use, or both, as well as the design complexity.

The known supporting frames are of plastic material and comprise two elongated members or arms pivotally joined together, at least one of them having an extension that extends beyond the pivoting axis in order to partially overlap the other when the frame reaches the coplanar configuration.

The parts to be superimposed are of reduced thickness, also to save material and to get a support which is not too heavy.

In order to block the two arms in the working flat configuration, constraint or locking means are provided that prevent the undesired collapsing of the frame, such means being preferably located in the overlapping area and at the end portion of the above mentioned extension. Such means are usually devised for an easy assembly and disassembly (i.e. such as to be actuated by a single hand or a foot).

There are presentely known mechanical, magnetic or mixed locking means that are complex and require components such as permanent magnets, springs, metal pins, and other metal parts that make the production more laborious and raise the costs and the weight of the finished product.

It is therefore an object of the present invention to realize an improved supporting frame of the type indicated above which is simple, effective and lightweight.

The invention consists of a cleaning device comprising an elongated handle, a supporting frame removably and pivotally connected to an end of said handle, and a web of fabric stretched over said supporting frame, said supporting frame comprising two elongated members or arms pivoted together and locking means to block said arms in a coplanar configuration and to disengages them, characterized in that said arms are of plastic material and coupled together by snap fitting thanks to pivot pins and pivot seats integer with the arms, at least one of said arms providing for an extension that extends beyond the pivoting axis in order to partially overlap the other arm when the frame reaches the coplanar configuration, and in that said locking means comprises a plastic pawl pivotally connected to one of the arms.

Additional advantageous features are the objects of the dependent claims.

According to the invention, the supporting frame is completely of plastic material, no metal element being required (not even for the pins), and such frame comprises only three members, namely two arms and a pawl, wherein the coupling between the pivot pins (that are molded integer with the arms) and the seats thereof takes place by snap fitting.

The locking means to keep coplanar the two arms (in the working step) is carried out by means of clip or snap fitting engagement, by applying a proper force to overcome an initial interference of the parts to be connected.

In order to disengage the two arms from the coplanar condition, it is used a pawl of the type having a lever with a central fulcrum or pivot point, which applies a force acting along an opposite direction with respect to the one applied initially to set the assembly flat.

A preferred 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 or cleaning device according to the invention;

Fig. 2 is a cross section view along lines K-K of Fig. 1;

Fig. 3 is an top view of one of the arms;

Figures 4 and 5 are cross section views of the arm of Fig. 3 along lines K-K and Y-Y, respectively;

Fig. 6 in an top view of the other arm;

Figures 7 and 8 are cross section views of the arm of Fig. 6 along lines K-K and Z-Z, respectively;

Fig. 9 is a bottom view of the supporting frame of Fig. 1;

Figures 10 and 11 are cross section views of the frame of Fig. 1 along lines W-W and K′-K, respectively;

Figures 12 and 13 are bottom views of the two arms;

Fig. 14 shows a portion of the cotton web only tied to the frame;

Fig. 15 is a cross section view of the three components (not coupled together) of the supporting frame;

Figures 16 to 18 are cross section views of the supporting frame; and

Figures 19 and 20 are a side view and a top view of the pawl member, respectively.

With reference to the Figures, and particularly to Figures 1 to 12, the supporting frame of the invention comprises two elongated member or arms, 1 and 2 that in use are assembled together. As it is clearly shown in the drawings, the arms 1 and 2 are adapted for a partial overlapping, with the parts interpenetrating with each other thanks to proper thickness reductions.

The arm 2 provides for a portion of reduced width from which a pair of opposed pivot pins 3 protrude, and a reduced thickness portion marked by 7 in the middle area thereof.

On the underside of the reduced width portion, the arm 2 carries opposed seats 5, each formed as a longitudinally opened sleeve of circular cross section, provided for cooperating with a corresponding pair of engagement pivot pins 4 on arm 1. On the opposite side, two projections 8 are present onto which the user pushes in order to force the seats 5 into engagement with the above mentioned pivot pins 4.

In the reduced width portion, the arm 2 further carries a shoulder 9 for an axis 10 over which it is to be applied an articulated member (not shown) for the connection to the shaft of the handle (also not shown). At the other end the arm 2 further provides for a C shaped projection 17 to which can be anchored a tape connected to the cotton web 19.

The arm 1 provides for a middle opening or window 13 in which are arranged seats 11, formed as grooves with a circular cross section inner portion and a flared outer portion, adapted to engage the pivot pins 3. The arm 1 further provides for a pair of opposed engagement pivot pins 4 protruding into the window 13.

The shape of pivot pins 3 is such that it can be housed into the seats 11 after a moderate resilient deformation to overcome an interference between them, and the same applies also to the snap fitting between pivot pins 4 and the seats 5.

A central pivot pin 6 is further provided on arm 1, cooperating with the window 13 and the reduced thickness portion 7 for positioning a pawl member 14-16 that will be now illustrated with reference in particular to Figures 15, 18, 19 and 20.

Such pawl member is shaped like a lever with an intermediate fulcrum (at 16) and a flat round portion 15 adapted to be pressed by the user's foot, and an actuating end 14. The pawl member 14-16 is received in the reduced thickness portion 7 and in the window 13, and is hinged at pivot pin 6 of arm 1.

To assembly the supporting frame, the pawl member 14-16 is initially applied to the arm 1 by forcing the seat 16 over the pin 6, and then the arms 1 and 2 are mutually positioned in such a manner that the seats 11 lay over the pivot pins 3. By pressing together the arms, the seats are resiliently deformed and the pins are received within them so as to form an articulated frame as can be seen in Fig. 16.

Then a cotton web or cloth is applied to the frame by fitting the pockets onto the ends of the supporting (not yet coplanar) frame. Finally, by pressing (e.g. by means of a foot) over the projections 8 of arm 2, a similar snap fitting engagement takes place between pivot pins 4 and the seats 5 thus rendering the frame rigid and coplanar, and stretching the cotton web (not shown).

When the user pushes over portion 15, the actuating portion 14 forces the end of arm 2 upward, so that the seats 5 disengage (through a temporary elastic deformation) from the pivot pins 4.

By manoeuvering the broomstick handle connected to the attachement 9-10 (not shown), the cotton broom can be dipped into a basin containing water and squeezed without being touched by the hands.

From what has been disclosed, it appears that the novel construction and locking means provided for by the present invention is quite advantageous in respect of the complicated and involved devices proposed until now, and that the supporting frame is simple and cheaper being formed by three components only and with the exclusion of any metal part.

## Claims

1. A cleaning device comprising an elongated han-

dle, a supporting frame removably and pivotally connected to an end of said handle, and a web of fabric stretched over said supporting frame, said supporting frame comprising two elongated members or arms pivoted together and locking means to block said arms in a coplanar configuration and to disengages them, characterized in that said arms (1, 2) are of plastic material and coupled together by snap fitting thanks to pivot pins (3, 4) and pivot seats (11, 5) integer with the arms, at least one of said arms (2) providing for an extension that extends beyond the pivoting axis in order to partially overlap the other arm (1) when the frame reaches the coplanar configuration, and in that said locking means comprises a plastic pawl (14-16) pivotally connected to one (1) of the arms.

2. A cleaning device as claimed in claim 1, characterized in that said pawl member is shaped like a lever with an intermediate fulcrum (at 16) and a flat round portion (15) adapted to be pressed by the user's foot, and an actuating end (14), the pawl member (14-16) being received in a reduced thickness portion (7) and in a window (13) of one (1) of the arms and pivotally coupled to a central pin (6) of the same arm (1).

3. A cleaning device as claimed in claim 1 or 2, characterized in that said pivot pins (3, 4, 6) as well as the corresponding seats (11, 5) are formed at the same time with the arms molding.

4. A cleaning device as claimed in claim 3, characterized in that one of the arms (2) provides for a portion of reduced width having a pair of opposed protruding pivot pins (3), and a reduced thickness portion (7) in the middle area thereof.

5 . A cleaning device as claimed in claim 4, characterized in that said arm (2) carries opposed seats (5), each formed as a longitudinally opened sleeve of circular cross section, and, on the opposite side, two projections (8) onto which the user pushes in order to force the seats (5) into engagement with the above mentioned pivot pins (4).

6. A cleaning device as claimed in claim 4, characterized in that said arm (2), in the reduced width portion, further carries a shoulder (9) for the connection to the shaft of the handle, and that at the other end of said arm (2) is further provided a C shaped projection (17) to which can be anchored a tape connected to the cotton web (19).

7. A cleaning device as claimed in claim 4, characterized in that said other arm (1) provides for a middle opening or window (13) in which are arranged seats (11), formed as grooves with a circular cross section inner portion and a flared outer portion, adapted to engage a pair of said pivot pins (3), said arm (1) further providing for a pair of opposed engagement pivot pins (4) protruding into said window (13).

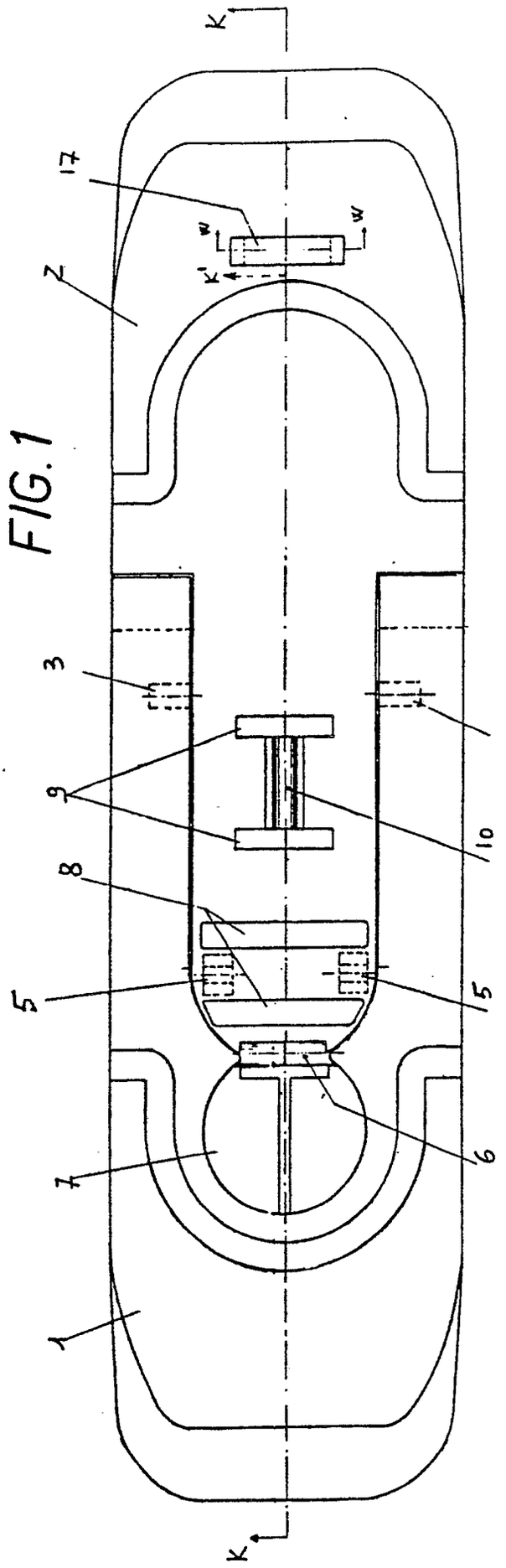


FIG. 1

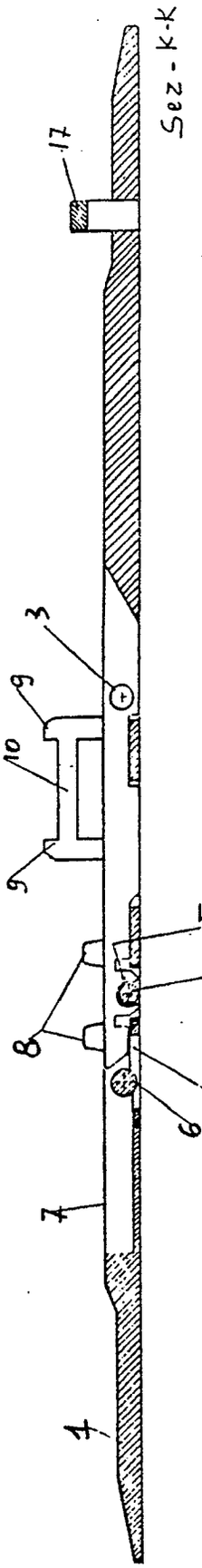


FIG. 2

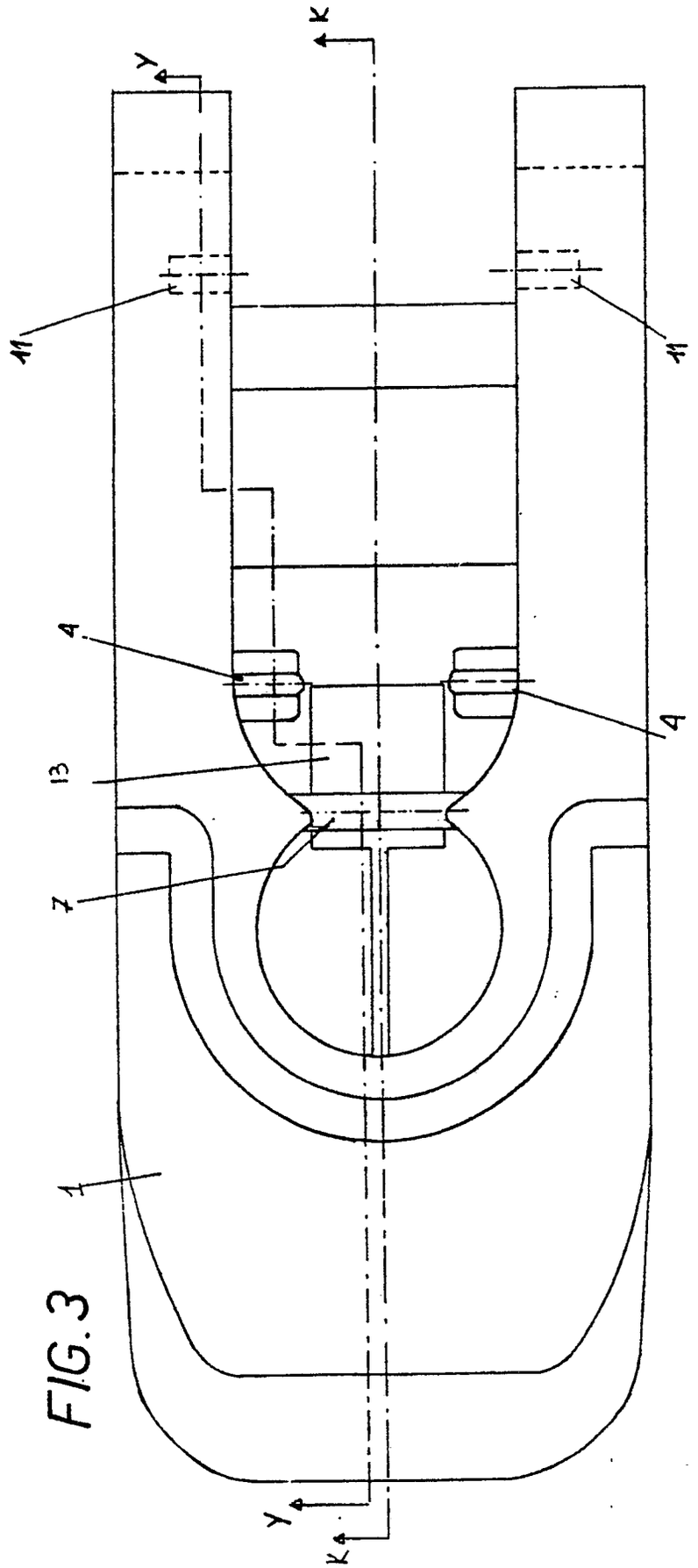


FIG.3

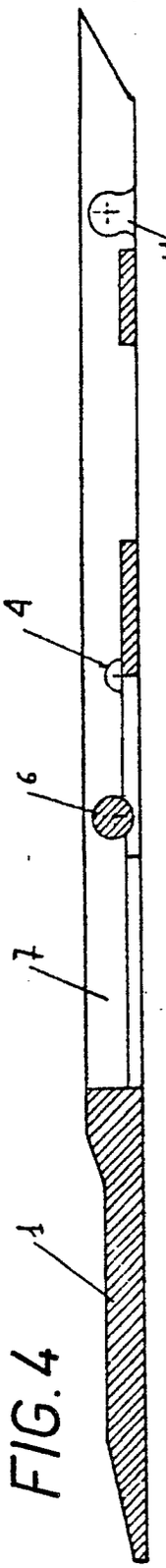


FIG.4

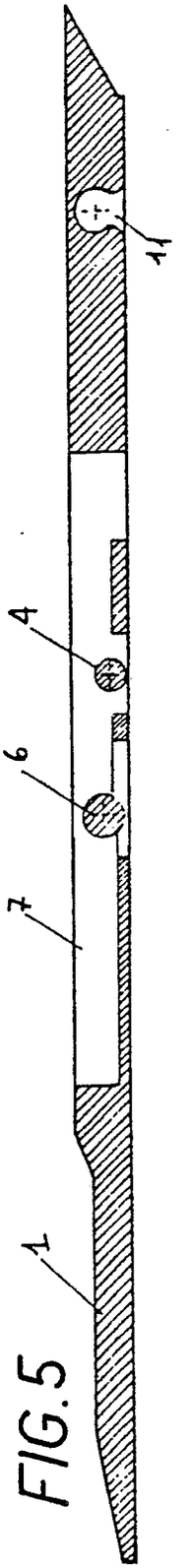


FIG.5

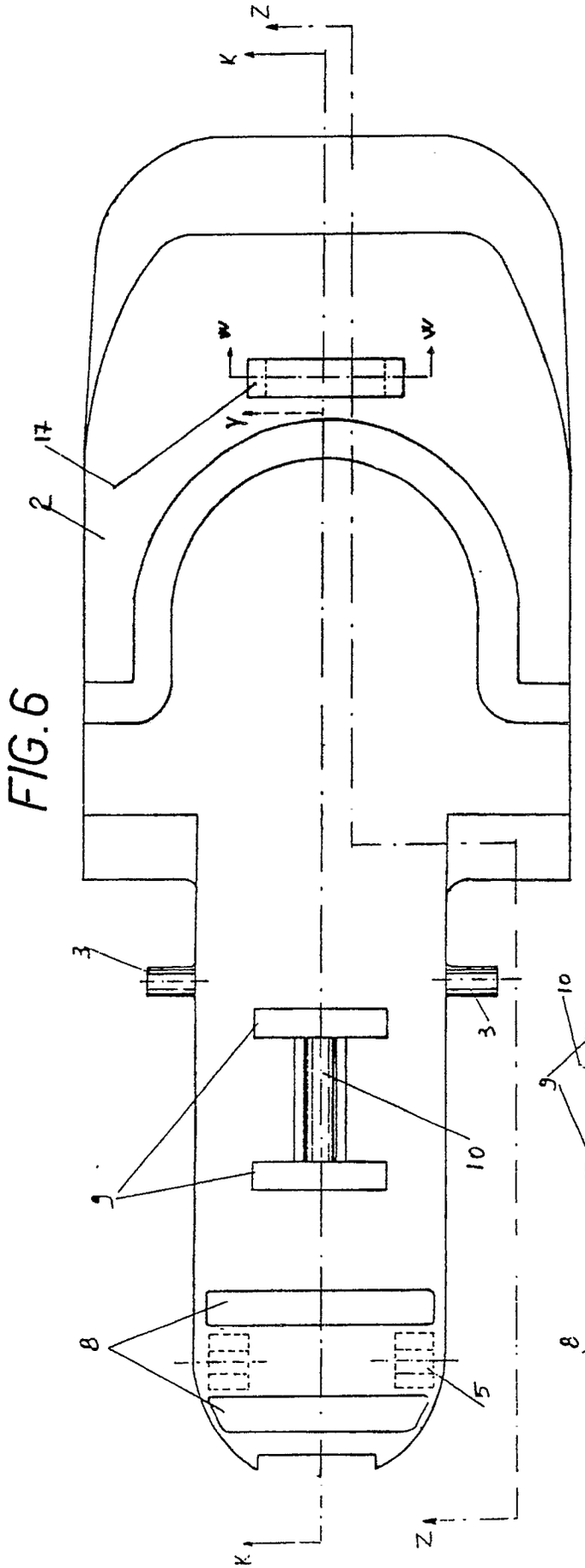


FIG.6

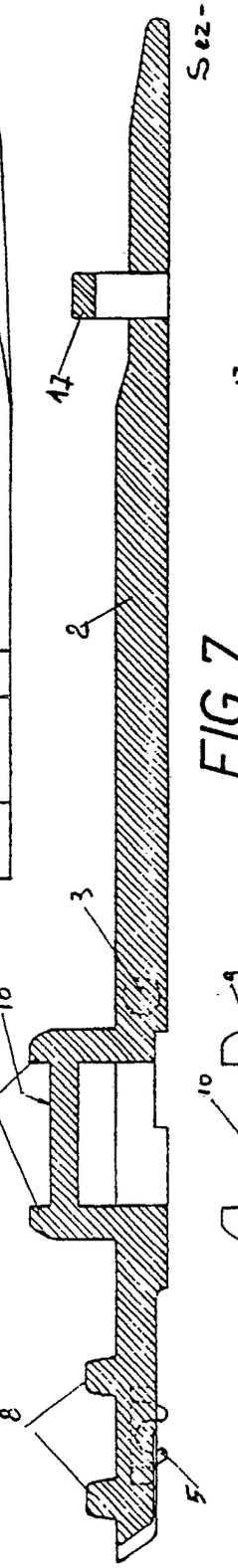


FIG.7

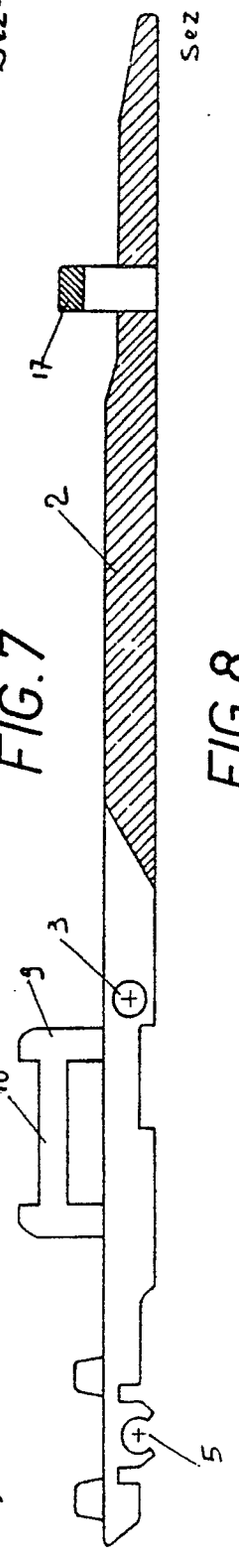


FIG.8

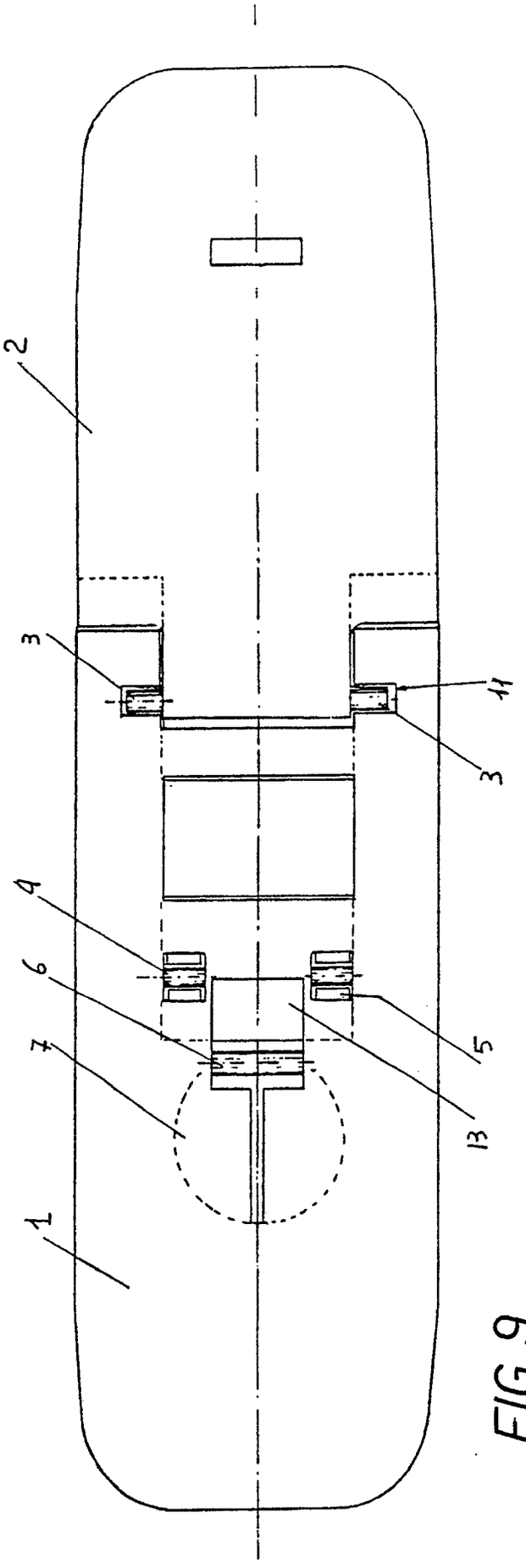


FIG.9

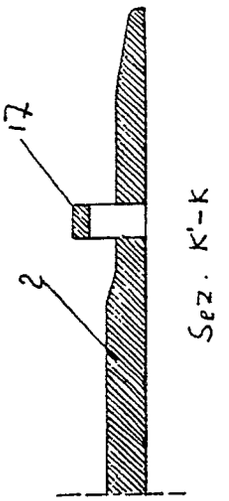


FIG.11

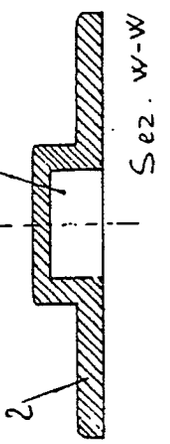


FIG.10

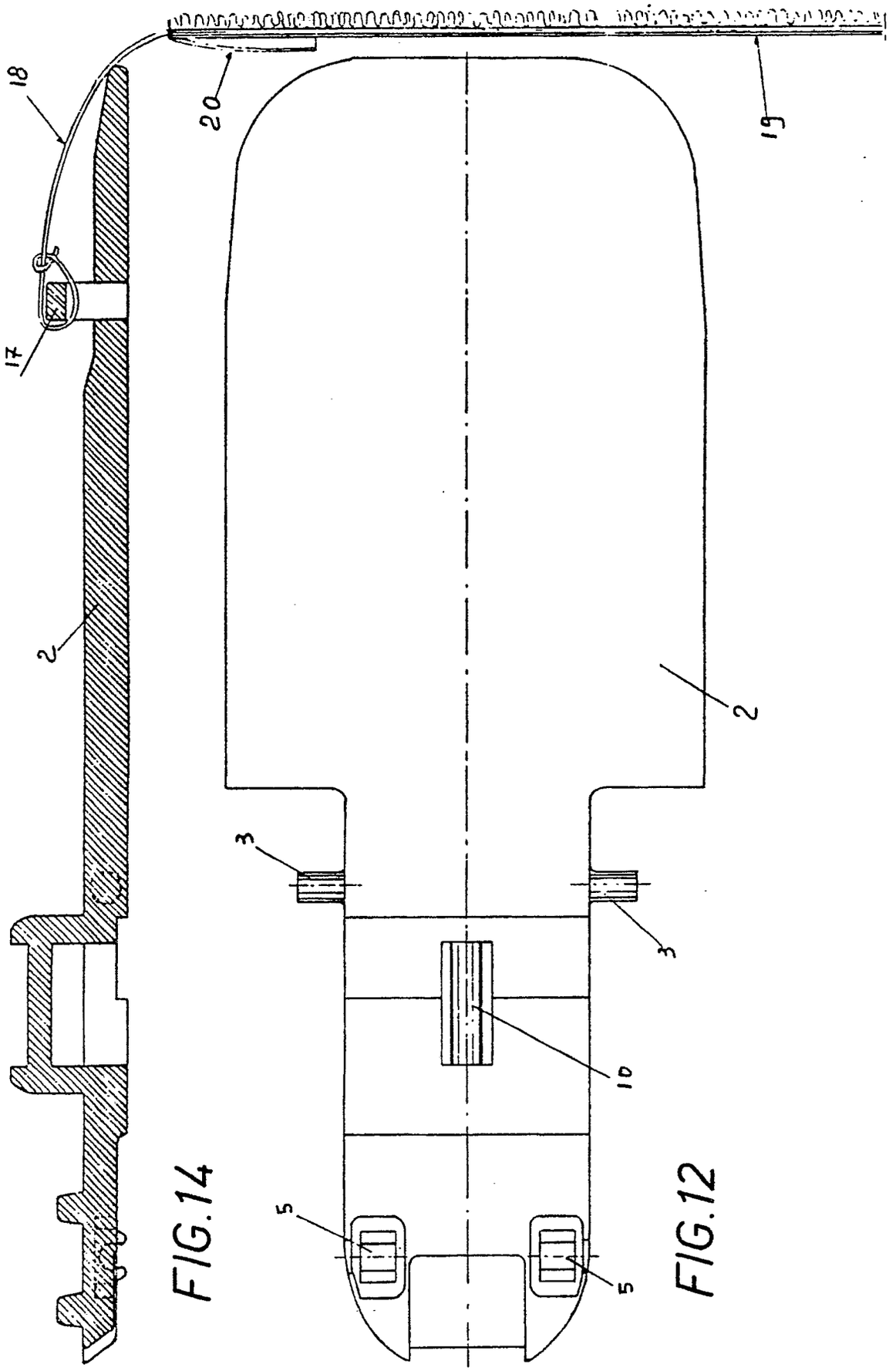


FIG.14

FIG.12

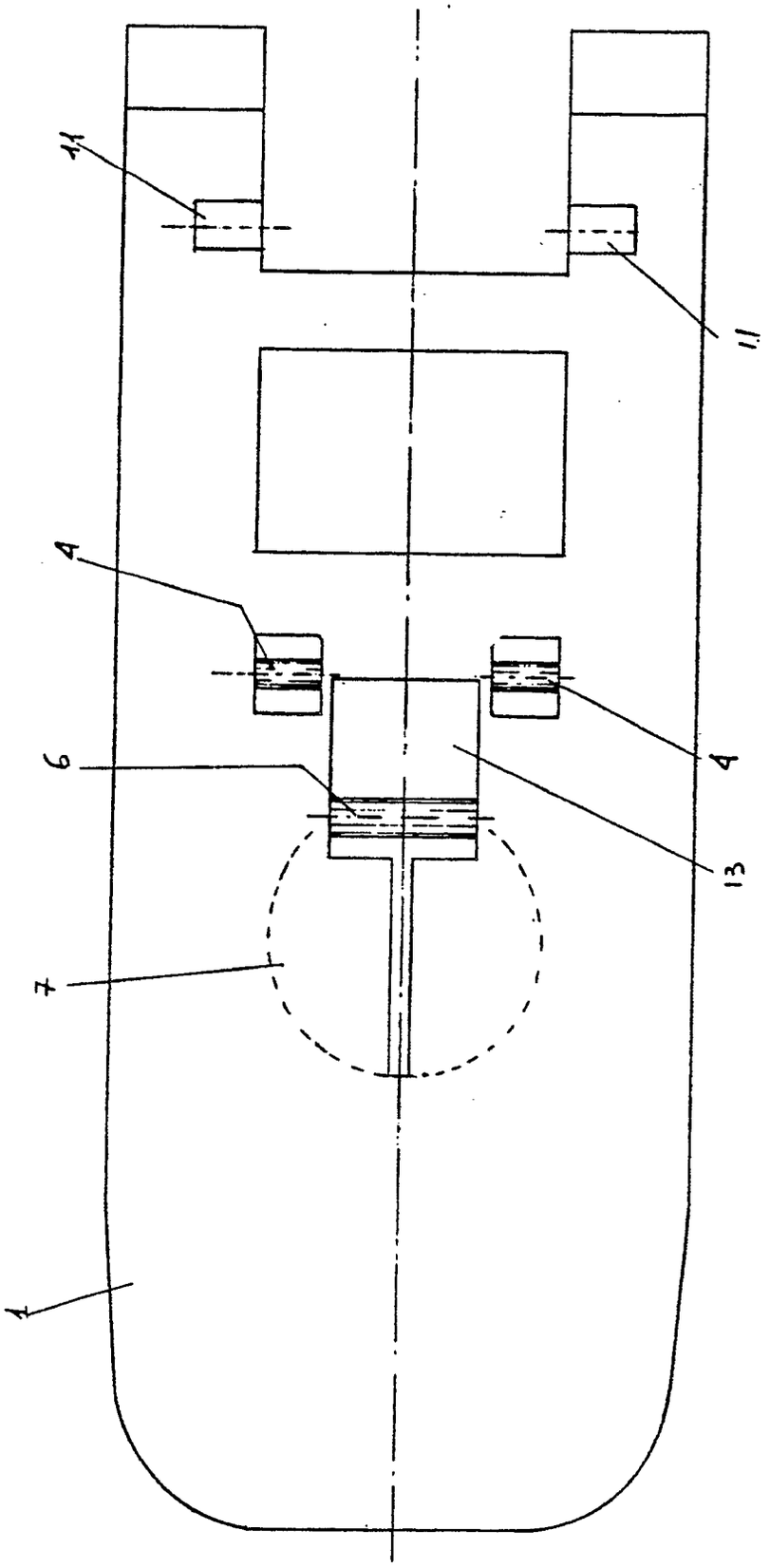


FIG.13

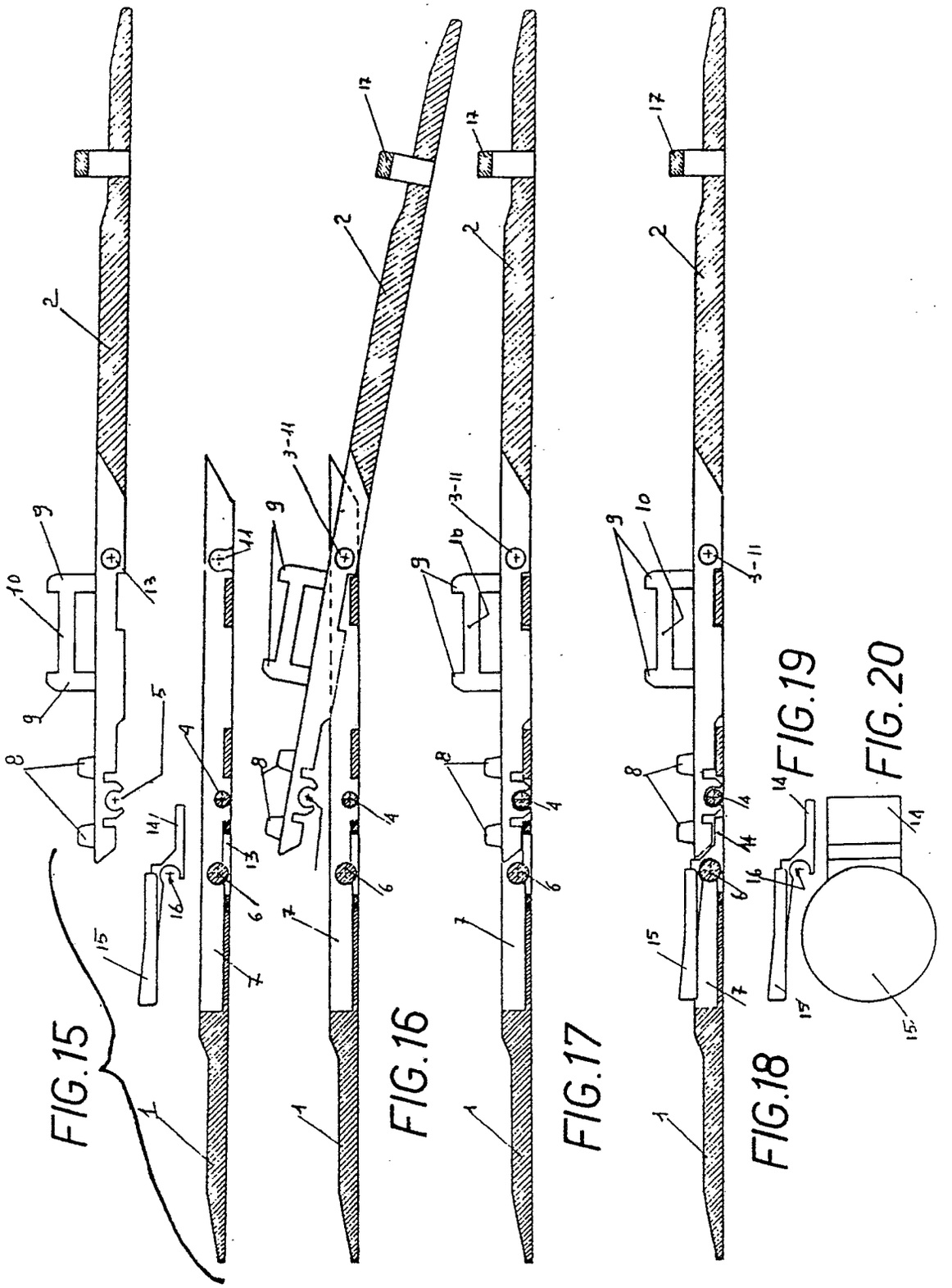

FIG.15

FIG.16

FIG.17

FIG.18

FIG.19

FIG.20

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number

EP 90 20 1936

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
|---|---|---|---|
| A | EP-A-0 175 019 (FLOORDRESS REINIGUNGSGERAETE GMBH)<br>* page 2, line 26 - page 4, line 22; figures * | 1,2,7 | A 47<br>L 13/258 |
| A | EP-A-0 150 417 (HENKEL KG AUF AKTIEN)<br>* page 6, line 11 - page 9, line 8; figures * | 1,7 | |
| A | DE-U-8 706 126 (VERMOP SALMON GMBH)<br>* page 12, line 1 - page 20, last paragraph; figures * | 1,2 | |
| A | DE-U-8 509 366 (NWG KG)<br>* page 3, line 20 - page 4, line 24; figures * | 1,2 | |
| A | EP-A-0 249 353 (SCOT YOUNG SERVICE SYSTEMS LTD) | | |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A 47 L

The present search report has been drawn up for all claims

| Place of search | Date of completion of search | Examiner |
|---|---|---|
| The Hague | 29 January 91 | VANMOL M.A.J.G. |

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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