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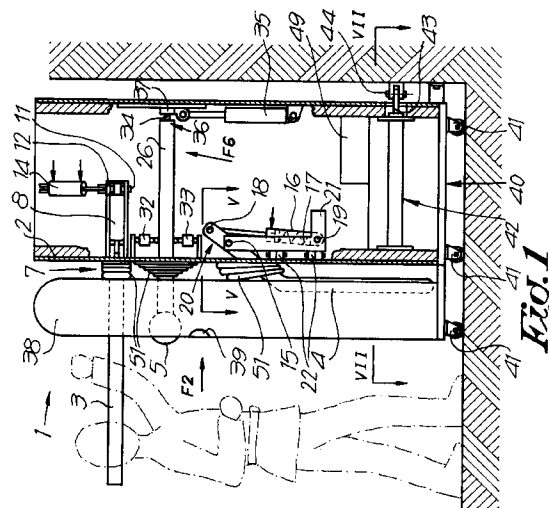
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(54) **Training appliance for combat sports.**

(57) Training appliance, characterized in that it mainly consists of a frame (2), a number of members mounted to the frame (2) in a moveable manner and drive means to move the members.



The present invention concerns a training appliance, in particular an appliance for practising fighting arts.

The invention hereby aims an appliance which is suited for practising a large number of fighting arts, oriental and non-oriental, armed and non-armed, or branches of these fighting arts, such as karate, boxing, kick-boxing, kung-fu, fencing, kendo, jo-do, muai-thai, judo, tae kwon do, savat box, kempo, etc.

To this aim the invention concerns a training appliance, characterized in that it mainly consists of a frame, a number of members mounted to the frame in a moveable manner and driving means to drive the members.

Preferably, the training appliance consists of the combination of the above-mentioned frame, a pair of hinged legs, a pair of hinged arms, at least one bumper, a bumping post and drive means to move all these members. The movements of the drive means can preferably be programmed or controlled by means of a control panel.

In order to better explain the characteristics according to the invention, by way of example only and without being limitative in any way, the following preferred embodiment is described with reference to the accompanying drawings, in which:

- figure 1 is a section of the training appliance according to the invention;
- figure 2 shows a view according to arrow F2 in figure 1;
- figure 3 shows a section according to line III-III in figure 2;
- figure 4 shows a section according to line IV-IV in figure 3;
- figure 5 shows a section according to line V-V in figure 1;
- figure 6 shows a view to a larger scale of the part indicated in figure 1 by means of arrow F6;
- figure 7 shows a section according to line VII-VII in figure 1.

As shown in figures 1 and 2 the training appliance 1 mainly consists of a frame 2, a number of moveable members, and drive means to move the members.

In the example shown, the members consist of two hinged arms 3, two hinged legs 4 and two bumpers 5, whereas the drive means preferably consist of a number of pressure cylinders, for example compressed air cylinders, which will be described more specifically hereafter.

The arms 3 preferably each consist of an element which, as shown in figure 3, can hinge around a hinge point 6 which is situated near one end 7. The movement is carried out by means of a pressure cylinder 8, which is preferably provided with a release spring 9, whereby said pressure cylinder 8 is mounted such between the hinge points 10 and 11, on the concerned arm 3 and a support 12 respectively, that in the non-excited condition of the pressure cylinder 8,

the arm 3 is spread sideways, and when a pressure is exerted on the concerned pressure cylinder 8, it is turned forward. Figure 1 shows the situation in which the arms 3 are pointed forward, whereas figure 2 shows the position in which the arms 2 are spread open.

Preferably, the arms 3 can also be adjusted in the height, for example because the support 12 is mounted such that it can rotate around the frame 2 by means of hinges 13, which as shown in figure 3 allow for the rotation along a horizontal axis. The support 12 can be rotated by means of suitable driving means. In the embodiment of figure 4, these consist of a double-acting pressure cylinder 14.

As shown in figure 1, the legs 4 preferably consist of elements which can rotate around hinge points 15. The legs 4 hereby hinge around horizontal axes and can be rotated upward from a condition of rest, in which they hang down vertically.

Each leg 4 can be moved by means of a corresponding pressure cylinder 16, which is provided with a release spring 17. The pressure cylinder 16 is mounted between hinge points 18 and 19, to the end 20 of the leg 4 in question and a support 21 respectively.

The support 21 is mounted to the frame 2 in a rotatable manner, for example by means of hinges 22, which as shown in figure 5 allow for a rotation along a vertical axis. A damping mechanism 23 is coupled to each support 21, which for example consists of the combination of a damper 24 and a spring 25. The damping mechanisms 23 allow for the legs 4 to be knocked away sideways by the user of the training appliance 1.

The construction of the above-mentioned bumpers 5 is represented in greater detail in figure 6. Each bumper 5 mainly consists of a pressure cylinder 26 with a release spring 27. The actual cylinder 28 is mounted in the frame 2, such that the piston rod 29 can make an ingoing and outgoing movement, in and out of the front of the appliance. On the foremost end 30 of the piston rod 29, a buffer 31 or such like is provided, which is made for example of synthetic material.

As shown in figure 6, the cylinder 28 can be hung up between dampers 32 and 33 which are mounted between the cylinder 28 and the frame 2 by means of ball fittings 34. The cylinder 28 can be tilted around the above-mentioned suspension by means of a double-acting pressure cylinder 35, such that the buffer 31 can be moved in and out in various directions. The rearmost end 36 of the cylinder 28 is supported by a vertically moving slide 37.

As shown in figures 1 and 2, the training appliance 1 is also provided with a bumping post 38, which in the example shown is fixed to the frame 2. This bumping post 38 is meant for boxing exercises. It may consist of different sorts of materials, for example

synthetic material, wood, rice straw, leather, canvas, etc. The bumping post 38 is mounted such to the frame that it can either or not be moved and/or replaced. In the case of a replaceable bumping post 38, the bumping post's design can be adapted to the user's requirements.

The bumping post 38 can be provided with a device which prevents all activities of the training appliance when certain spots are hit or stepped on. This device makes use of a pressure-sensitive sensor 39, for example a compressible air line which is built in under the skin of the bumping post 38 and which is connected to the drive of the appliance.

In order to obtain that the frame 2 can assume different positions, in order to optimally simulate the movements of an attacker, said frame 2 can be preferably moved. As shown in the figures 1, 2 and 7, the frame can be mounted to this end on a trolley 40 with freely turning wheel supports 41. The trolley 40 can be moved by means of a double-acting pressure cylinder 42 which is mounted on the trolley and which has a piston rod 43 whose end is connected to a fixed hinge point 44.

The trolley 40 is preferably provided with two guides 45 and 46, in the shape of a V, which stretch out and narrow towards the back and which can work in conjunction with fixed guide elements 47 and 48, such that a self-centring action is obtained during the ingoing movement of the piston rod 43. The guide elements 47 and 48 are preferably wheels. It is clear that also other guide means can be used.

Compressed air is preferably used as a source of energy. To this end a compressor 49 is built-in in the rolling frame 2 which provides the energy for all the above-mentioned pressure cylinders by means of valves and pipes which are not represented in the figures. It is clear that the drive may also be energized in an electrical, hydraulic, electro-magnetic, mechanical, electro-pneumatic or any other manner whatsoever. The valves are preferably electrically driven.

The training appliance is preferably provided with a control panel 50 and/or a built-in programmable unit so as to impose certain movements on the members. Preferably, the speed and force of the members can be adjusted.

It is clear that also the moveable members can be provided with sensors, for reasons of safety, to make further actions of the appliance impossible.

The training appliance 1 can also be equipped with a detection device which follows the movements of the user of the appliance, such that the different members, or at least a number thereof, can be activated, either or not with delay.

In order to prevent that parts of the user's body get squeezed between the members of the appliance 1 and the housing of the latter, flexible packings 51 are provided in those places where the members go through the housing.

The different members, in particular the arms 3, the legs 4 and the bumpers 5, can possibly be replaced partly or as a whole, such that elements made of soft or hard materials can be used to this end, or elements provided with a soft or hard coating, for example synthetic material, leather, wood, metal, cloth, etc. They can also be replaced by weapons such as a rapier, a kendo sword, sticks, and/or a combination of both. The limbs can possibly be provided with joints.

It is clear that, as shown in figure 1, the arms 3 are preferably situated at the height of the head of a person having a normal stature; that the legs 4 are situated opposite the legs of the user; and that the bumpers 5 are placed at breast-height.

The present invention is in no way limited to the embodiment described by way of example and shown in the accompanying drawings; on the contrary, such a training appliance can be made in various forms and dimensions while still remaining within the scope of the invention.

Claims

1. Training appliance, characterized in that it mainly consists of a frame (2), a number of members mounted to the frame (2) in a moveable manner and drive means to move the members.
2. Training appliance according to claim 1, characterized in that it is provided with a bumping post (38) at its front.
3. Training appliance according to claim 1 or 2, characterized in that the members contain at least one arm (3).
4. Training appliance according to claim 3, characterized in that the members consist of at least two arms (3) placed next to one another.
5. Training appliance according to claim 4, characterized in that the arms (3) consist of hinged elements which are spread in a condition of rest and which, in the activated condition, are brought together to the front of the appliance (1).
6. Training appliance according to claim 4 or 5, characterized in that each arm (3) is mounted on a rotatable support (12), which is provided with drive means, such that the angle under which the arm (3) is placed, can be altered.
7. Training appliance according to any of the above claims, characterized in that the members contain at least one leg (4).

8. Training appliance according to claim 7, characterized in that it has two legs (4) placed next to one another.

9. Training appliance according to claim 7 or 8, characterized in that each leg (4) consists of an element which hangs down in a condition of rest and which is turned upward in a vertical field when activated.

10. Training appliance according to claim 7, 8 or 9, characterized in that each leg (4) is mounted on a support (21) which can be rotated around a mainly vertical axis, and which is provided with a damping mechanism (23) which forces the support (21) in a specific position.

11. Training appliance according to any of the above claims, characterized in that the members contain at least one bumper (5).

12. Training appliance according to claim 11, characterized in that it has two bumpers (5) placed next to one another which can make an ingoing and outgoing movement on the front side of the training appliance (1).

13. Training appliance according to claim 11 or 12, characterized in that each bumper (5) mainly consists of a pressure cylinder (26), with an ingoing and outgoing piston rod (29) which is provided at its free end (30) with a buffer (31).

14. Training appliance according to claim 11, 12 or 13, characterized in that it has a bumper (5) which is suspended between dampers (32,33) such that it can move freely.

15. Training appliance according to claim 14, characterized in that the bumper (5) is provided with drive means which make it possible to set the bumper (5) in question under different angles.

16. Training appliance according to claim 1 or 2, characterized in that it consists of a combination of members containing at least two arms (3) which can move between a spread position and a stretched position, which are situated at head-height; two legs (4) which can move between a position in which they hang down practically reaching the ground and a position in which they are lifted up; and two bumpers (5) placed at breast-height and which can make an ingoing and outgoing movement on the front side of the training appliance (1).

17. Training appliance according to any of the above claims, characterized in that the frame (2) is

placed on a trolley (40) and in that it is provided with a drive to move said trolley (40).

18. Training appliance according to claim 17, characterized in that the trolley is provided with freely turning wheel supports (41) and in that the drive consists of a pressure cylinder (42) between the frame (2) and a fixed hinge point. (44).

19. Training appliance according to claim 18, characterized in that it is provided with guide means which provide for a centring action during the ingoing movement of the pressure cylinder (42).

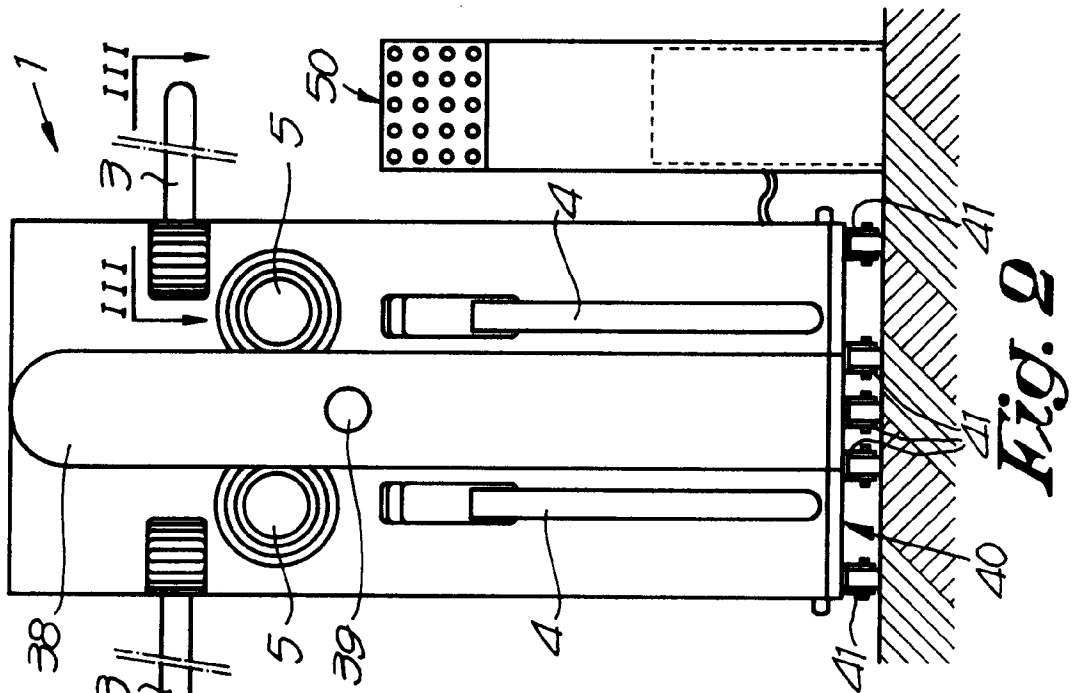
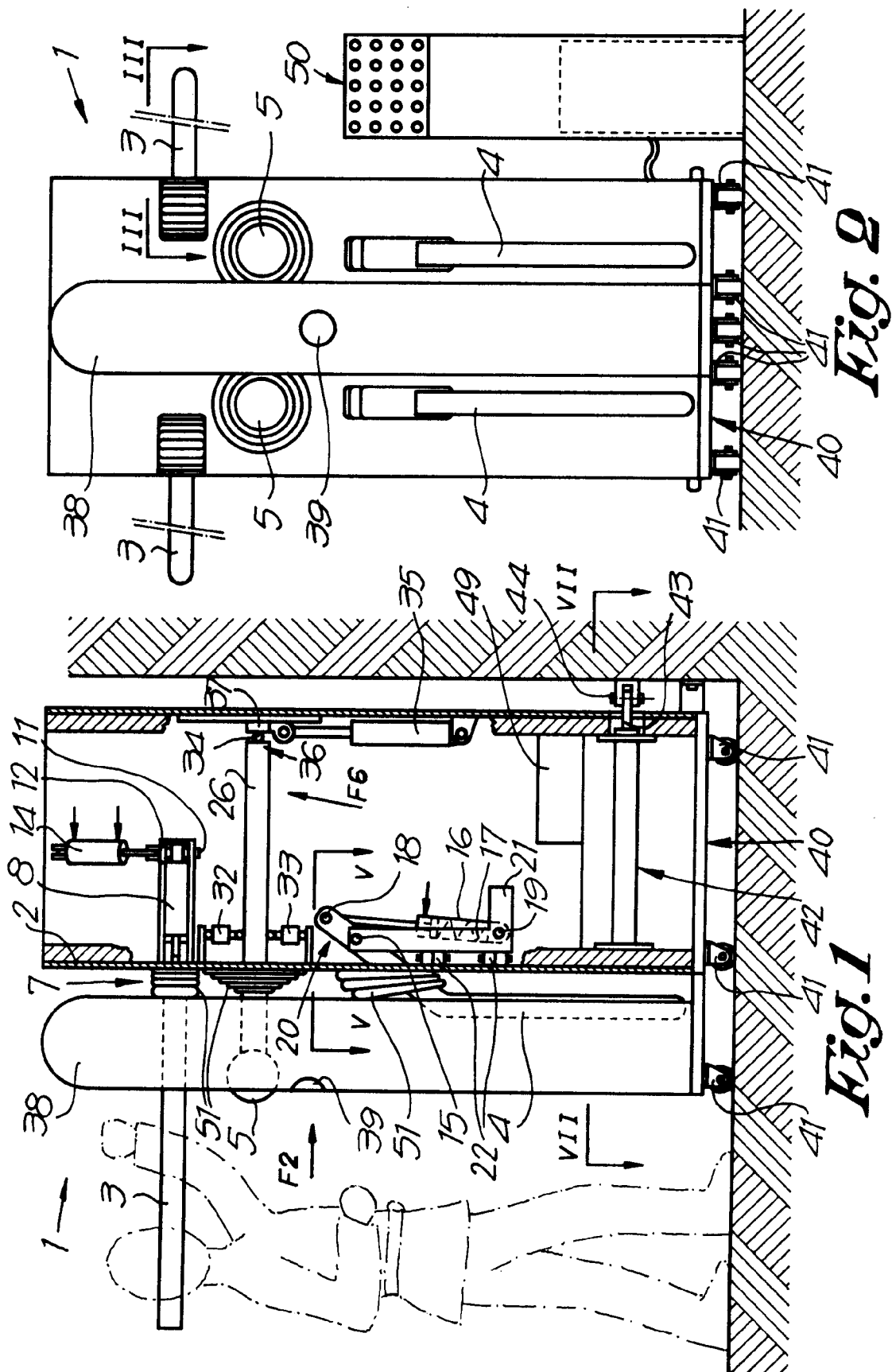
20. Training appliance according to any of the above claims, characterized in that the drive means to move the members mainly consist of pressure cylinders (8, 14, 16, 26, 35).

21. Training appliance according to claim 20, characterized in that the pressure cylinders (8, 14, 16, 26, 35) are compressed air cylinders.

22. Training appliance according to any of the above claims, characterized in that it is provided with a control panel (50) to control the members.

23. Training appliance according to any of the above claims, characterized in that it is provided with a programmable control.

24. Training appliance according to any of the above claims, characterized in that it is provided with a number of pressure-sensitive sensors (39) which interrupt all movements of the members when touched.



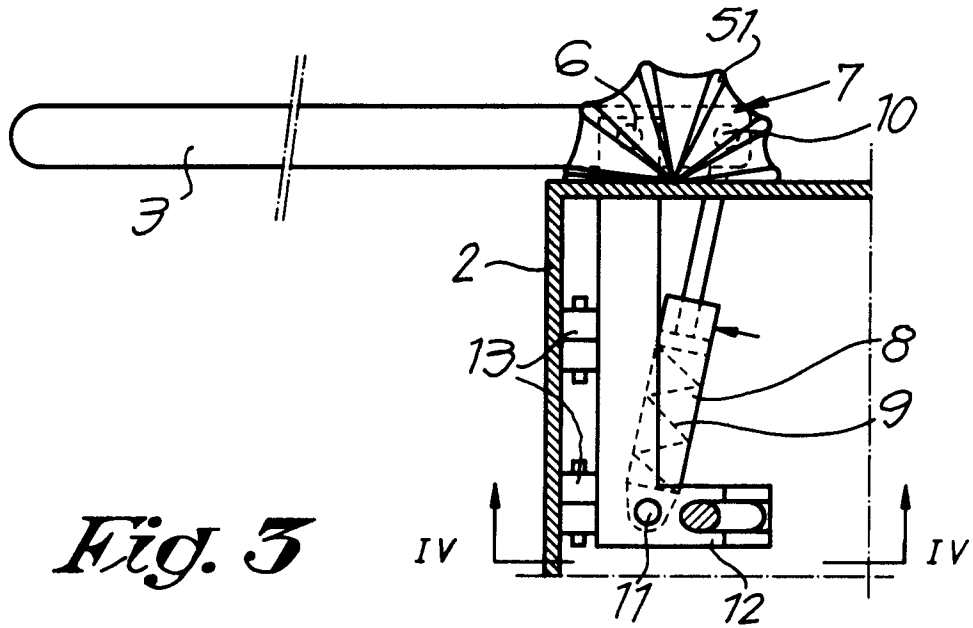


Fig. 4

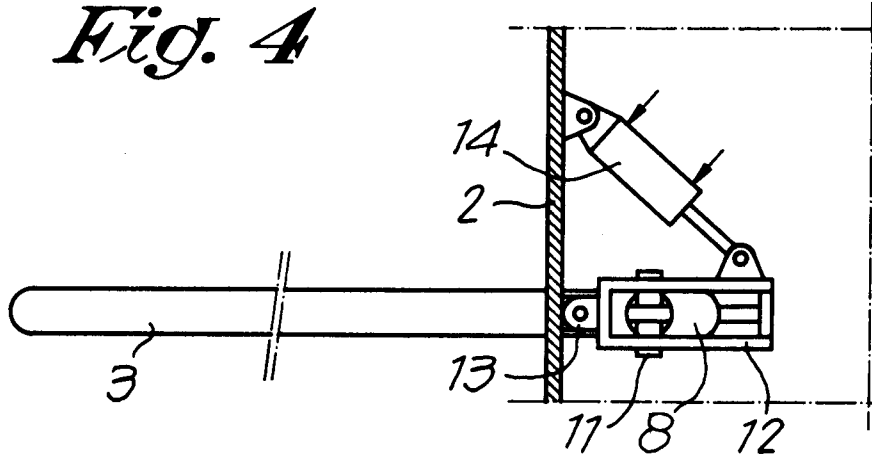
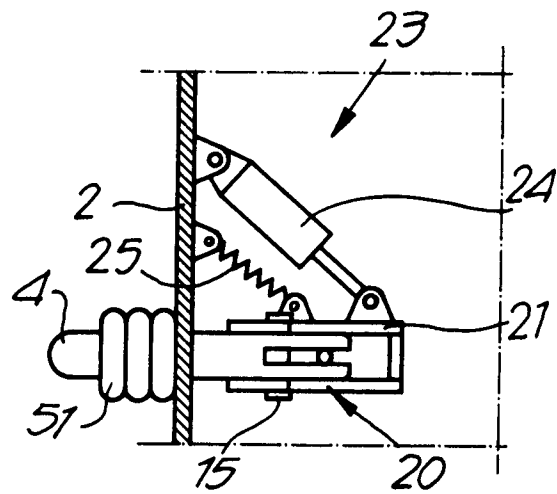


Fig. 5



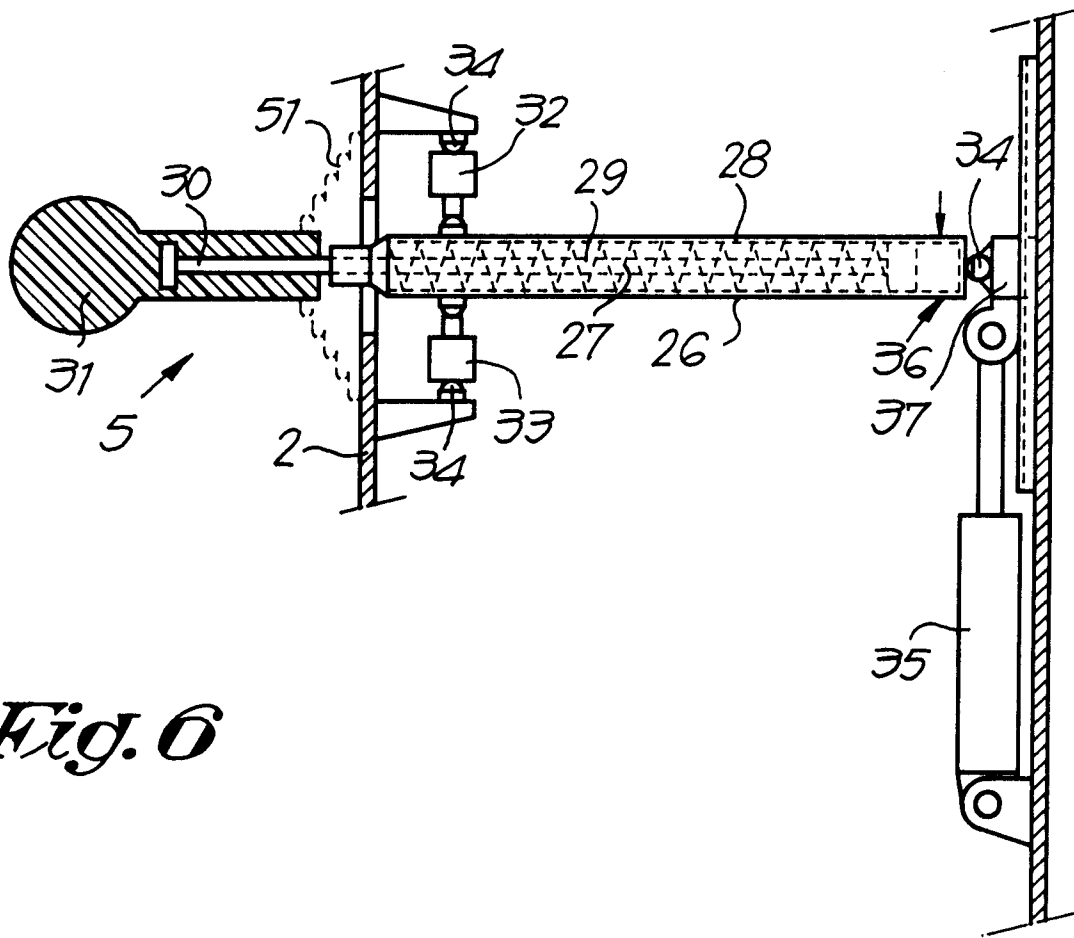


Fig. 6

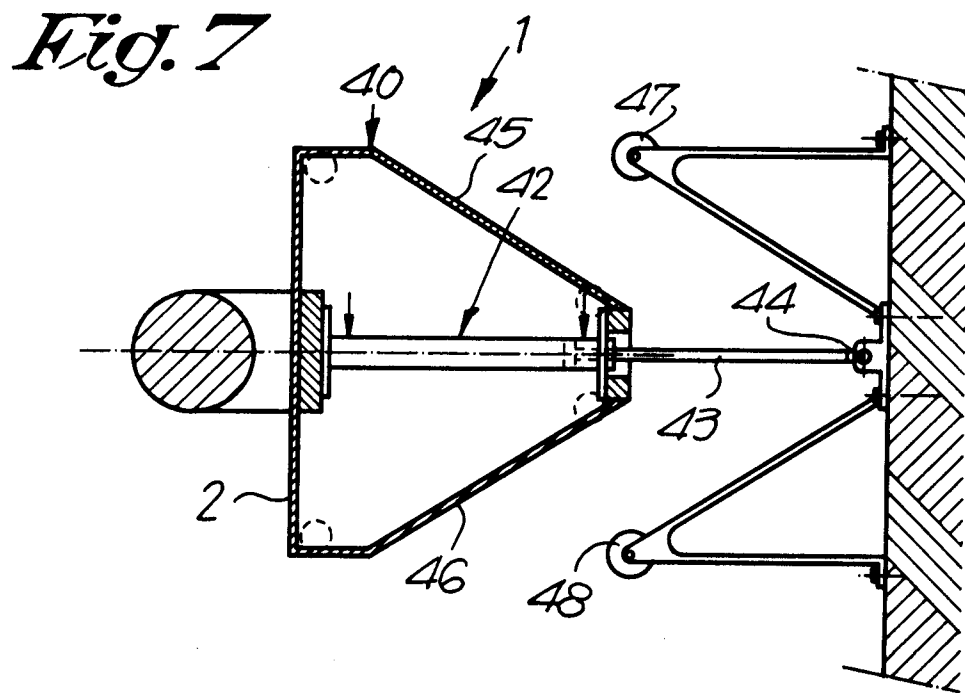


Fig. 7