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

(11) Publication number: **0 352 836**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **89201780.7**

(51) Int. Cl.4: **B65H 67/06**

(22) Date of filing: **05.07.89**

(30) Priority: **29.07.88 IT 2156688**

(43) Date of publication of application:
31.01.90 Bulletin 90/05

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

(71) Applicant: **GALVANIN S.N.C.**
Via Della Fisica, 8
I-36016 THIENE (Vicenza)(IT)

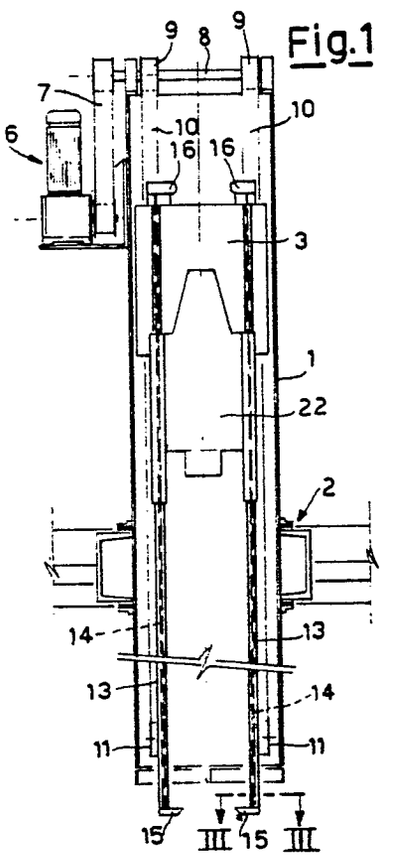
(72) Inventor: **Galvanin, Bruno**
Viale Europa, 44
I-36035 Marano Vicentino (Vicenza)(IT)

(74) Representative: **Mittler, Enrico et al**
c/o Marchi & Mittler s.r.i. Viale Lombardia, 20
I-20131 Milano(IT)

(54) Loading and unloading device for stackers of yarn cones in variable number with the possibility of insertion and extraction of a compression element of the stacked cones.

(57) The device includes a tubular outer housing (1) having a vertical axis, in which a main mobile element (3) may be made to slide supporting a plurality of vertical rods (14) provided with lower terminal tangs (15) which may be made to engage with the base of a selected cone. An auxiliary mobile element (22) below provided with means (35) for the engagement and the disengagement of a compression element (37) of the stacked cones may be made integral with said main mobile element (3) at a variable preset distance.

Fig.1



EP 0 352 836 A2

Loading and unloading device for stackers of yarn cones in variable number with the possibility of insertion and extraction of a compression element of the stacked cones.

This invention relates to a loading and unloading device for stackers of yarn cones in variable number with the possibility of insertion and extraction of a compression element of the stacked cones.

There exist and there will exist installations for the treatment of yarn cones, which provide for the stacking of the cones on vertical shafts while waiting for subsequent operations.

From the stacks thus obtained the cones may be taken all together, that is the entire stack, or in subsequent groups, or again the stack may contain a variable number of cones.

It should also be borne in mind that for processing purposes, say for dyeing the cones, it is sometimes necessary to place a compression element over the stack of cones and this must be evidently be inserted at the moment of loading and removed at the moment of unloading.

The object of the present invention is to accomplish a device which can load and unload a variable number of stacked cones, with the additional possibility of inserting and removing a compression element of the stack.

According to the invention such object is attained with a device comprising a tubular outer housing having a vertical axis, a main mobile element which may be made to slide axially within said housing and a plurality of vertical rods supported by said main mobile element and provided with lower terminal tangs which may be made to move from a disengagement position to an engagement position with the base of a cone selected from the stack for the subsequent raising of said selected cone and of the cones above it, characterized in that it also comprises an auxiliary mobile element provided with means for the engagement and disengagement of a compression element of the stacked cones, said auxiliary mobile element being arranged in a position below said main mobile element and it being also possible to make it integral with the former at a variable preset distance.

In this way, it is possible to execute the loading and unloading of a variable number of stacked cones, having in addition the possiblity of inserting and extracting a compression element from the top of the stack when this is required for the purposes of treatment of the stacked cones.

One possible embodiment of the present invention is illustrated for greater clarity, but with no limiting intention, in the enclosed drawings, wherein:

Fig. 1 shows a device according to the invention in a front schematic view with outer housing sectioned along a vertical plane passing through its axis;

Fig. 2 shows said device in a schematic lateral view at 90° with respect to Fig. 1;

Fig. 3 shows a detail of said device sectioned along the line III-III of Fig. 1;

Fig. 4 shows schematically another enlarged detail of the device of Fig.s 1 and 2;

Fig. 5 shows the same detail seen from the right hand side with respect to Fig .4;

Fig. 6 shows an enlarged front view of the auxiliary mobile element forming part of the above device;

Fig. 7 shows said auxiliary mobile element sectioned along the line VIII-VIII of Fig. 6;

Fig. 8 shows said auxiliary mobile element seen from the left hand side with respect to Fig. 6;

Fig. 9 shows the device illustrated in the previous figures sectioned transversally along the line IX-IX of Fig. 8;

Fig.s 10 and 11 show schematically several usage methods of the device of the previous figures.

The device illustrated in the drawings comprises a cylindrical tubular outer housing 1 having a vertical axis, which is rotatably carried by a supporting structure 2.

Inside the tubular housing 1 there is arranged a main mobile element 3, which is slidable along two vertical guide rods 4 with which it is engaged thanks to bushes 5 (Fig. 2).

Motion is imparted by a gear reducer 6, which by means of a belt transmission 7 causes shaft 8 to rotate provided with a pair of pulleys 9 on which there is wound a pair of toothed belts 10 driven at the lower end by another pair of pulleys 11 and constrained in 12 to the mobile element 3 (Fig.s 1 and 2).

The mobile element 3 is accomplished in the shape of a parallelepiped (Fig. 9) and near its vertical edges it has four hollow uprights 13, which act as guides for respective coaxial cylindrical rods 14, at whose lower extremities there are fastened perpendicular terminal tangs 15 (Fig.s 1-3). The rods 14 are rotatable on their axes so that the terminal tangs 15 are made to assume one or the other of the two positions illustrated by a continuous line and with a dash-and-dot line in Fig. 3, turned radially one towards the other and rotated outwards through 90°, respectively. The rotation of the rods 14 is obtained by means of respective rotating pneumatic cylinders 16 located on the top of the mobile element 3 (Fig.s 1 and 2).

At the lower extremity of the tubular housing 1 there are hinged on transverse parallel axes 17 two levers 18 with an arched shape operated by a cylinder 19 having a toothed rack 20 co-operating with two gear wheels 21 rotatable on axes 17 integrally with the levers 18 (fig.s 4 and 5). Thanks to the movement imparted by the cylinder 19 the two levers 18 are rotatable from the position illustrated by the continuous line in Fig. 5 to that illustrated by a dash-and-dot line in the same figure, and vice versa.

Below the main mobile element 3 there is arranged an auxiliary mobile element 22 provided with four tubular sleeves 23 slidable on the hollow uprights 13. The above auxiliary mobile element 22 comprises between the tubular sleeves 23 a frame 24 (Fig.s 6 and 7), by which there is slidably supported a block 25 vertically guided by small cylindrical bars 26 sliding in bushes 27.

Below the frame 24, on fastening appendices 28, two rotating cylinders 29 cause the rotation of an equal number of levers 30 provided with half-gates 50 and displaceable from one to the other of the two positions illustrated by a continuous line and with a dash-and-dot line in Fig. 6.

Inside the block 25 there are rotatably housed two vertical pivots 31, at whose upper extremities there are fastened two respective gear wheels 32 engaged with a central gear wheel 33 keyed on the shaft of a rotating pneumatic cylinder 34. At the lower extremities of pivots 31 there are also fastened perpendicularly respective tangs 35 rotatable through 90° to hold and release, respectively, the head 36 of an internally hollow compression organ or compensating organ 37.

The latter is a device known in itself which may be applied to the top of the central pivot of a cone stacker to compensate for the differences in height. It includes a spring 38 to provide pressure for the engagement accomplished by the compensator 37 with the stacker pivot.

Inside the block 25 there is also slidably housed an axially slidable nucleus 39 urged by a spring 40.

A pneumatic cylinder 41 allows the axial displacement of the pivots 31 to recover the compensator 37 once it has been released.

Two pneumatic cylinders 42 in turn accomplish the lowering of the block 25 and of the compensator 37 onto the cone stack and the compression of the compensating spring 38.

There are lastly provided means for the momentary engagement of the auxiliary mobile element 22 with the tubular housing 1 and with the four vertical rods 13, respectively.

These are two engagement elements 43 integral with the stems 44 of two small pneumatic cylinders 45 (Fig.s 8 and 9) integral with the frame 24. Such engagements 43 may be connected alternately with fixed locators 46 of the tubular housing 1 and with notches 47 at different heights of the hollow uprights 13 (Fig. 9), so that the mobile element 22 may be clamped with respect to the uprights 13 at different heights corresponding to different numbers of cones to load or unload.

From the described structure there derives the following operating mode of the device illustrated in the drawings.

Assuming that the device is to be used to load and unload a stacker for a dyeing station, so that it is necessary that a compression element such as that indicated with 37 in Fig.s 6 and 7 be positioned on top of the cone stack, there is first of all accomplished the setting of the position of the auxiliary mobile element 22 with respect to the main one 3 in relation to the height of the stack, formed by ten cones 60 on the stacker 61 of Fig. 10, by five on that of Fig. 11. Such a setting is executed by clamping the auxiliary-mobile element 22 with respect to the outer housing 1 by means of the engagements 43 in the fixed locators 46, then displacing the main mobile element 3 axially until the desired distance is reached fixed by selected notches 47 of the rods 13 and finally by withdrawing the engagements 43 back so as to disengage them from the fixed locators 46 and engaging them instead with the above notches 47 of the rods 13.

Once this has been executed, if the required operation is that of loading the stacker 61, the device takes from a suitable magazine a stack of cones in a number corresponding to the distance between the tangs 15 and the auxiliary mobile element 22 and transfers it onto the stacker 61, fitting the central hole of the cones 60 over the vertical pivot 62 of the stacker itself.

During the first part of such an operation the cylinder 19 holds the two levers 18 in the position illustrated by a continuous line in Fig. 5 to centre and hold in position the stacker's pivot 62. Subsequently, after the insertion of part of the first cone, the two levers 18 open to allow free access space to the stack.

The two mobile elements 3 and 22 then descend integrally together with the stack of cones 60 and at the end of the descent the rotating cylinder 34 causes the pivots 31 to rotate and obtain the release of the compression organ or compensator 37 by the tangs 35. The compensator 37 slips onto the pivot 62 of the stacker and the pneumatic cylinders 42 lastly provide for the compression of the compensating spring 38 and thus of the stack of cones 60.

At the moment when the pivot 62 of the stacker is inserted into the inner hole of the compensator 37 the two levers 30 are driven by the cylinders 29 to the position illustrated by a continuous line in

Fig. 6 to centre the stacker pivot 62 and hold it in position.

The same operation occurs both for stacks of cones having a great height (Fig. 10) and for stacks having a lesser height (Fig. 11), the only difference being represented by the different distance set between the auxiliary mobile element 22 and the main mobile element 3.

Inversely, in the case of the subsequent withdrawal of the stack so loaded, the two mobile elements 3 and 22 are caused to descend integrally until the tangs 15 of the rods 14 are inserted below the base of a cone selected from the stack, be it one below or an intermediate one.

After which, with the auxiliary element 22 in contact with the upper cone the cylinder 41 is driven to displace the pivots 31 slightly downward and allow the tangs 35 to arrange themselves below the engagement head 36 of the compensator 37 and then to engage it thanks to the rotation imparted by the cylinder 34.

The subsequent ascent of the integral mobile elements 3 and 22 allows the raising of the compensator 37 and of the stack of cones in the desired number from the stacker 61.

In the case of loading and unloading of a stacker which does not require a compensator 37, naturally, the auxiliary mobile element 22 remains as close as possible to the main mobile element 3 and no insertion or compression of the compensator itself is executed.

Claims

1. Loading and unloading device for stackers of yarn cones in variable number with the possibility of insertion and extraction of a compression element of the stacked cones, comprising an tubular outer housing (1) having a vertical axis, a main mobile element (3) which may be made to slide axially within said housing (1) and a plurality of vertical rods (14) supported by said main mobile element (3) and provided with lower terminal tangs (15) which may be made to move from a disengagement position to an engagement position with the base of a cone selected from the stack for the subsequent raising of said selected cone and of the cones above it, characterized in that it also comprises an auxiliary mobile element (22) provided with means (35) for the engagement and disengagement of a compression element (37) of the stacked cones, said auxiliary mobile element (22) being arranged in a position below said main mobile element (3) and it being also possible to make it integral with the former at a variable preset distance.

2. Device according to claim 1, characterized in that said engagement and disengagement means (35) are constituted by perpendicular lower tangs (35) of pivots (31) which may be caused to rotate from a disengagement position to an engagement position of said perpendicular tangs (35) with an engagement head (36) of said pressure means (37).

3. Device according to claim 2, characterized in that said pivots (31) are housed in a block (25) which may be displaced downward with respect to a supporting frame (24) of said auxiliary mobile element (22).

4. Device according to claim 1, characterized in that said means (43) for clamping said auxiliary mobile element (22) comprise engagement elements (43) carried by said auxiliary mobile element (22) and displaceable from a disengagement position with fixed locators (46) of said tubular housing (1) and an engagement position with notches (47) at a preset height of said rods (14).

Fig.1

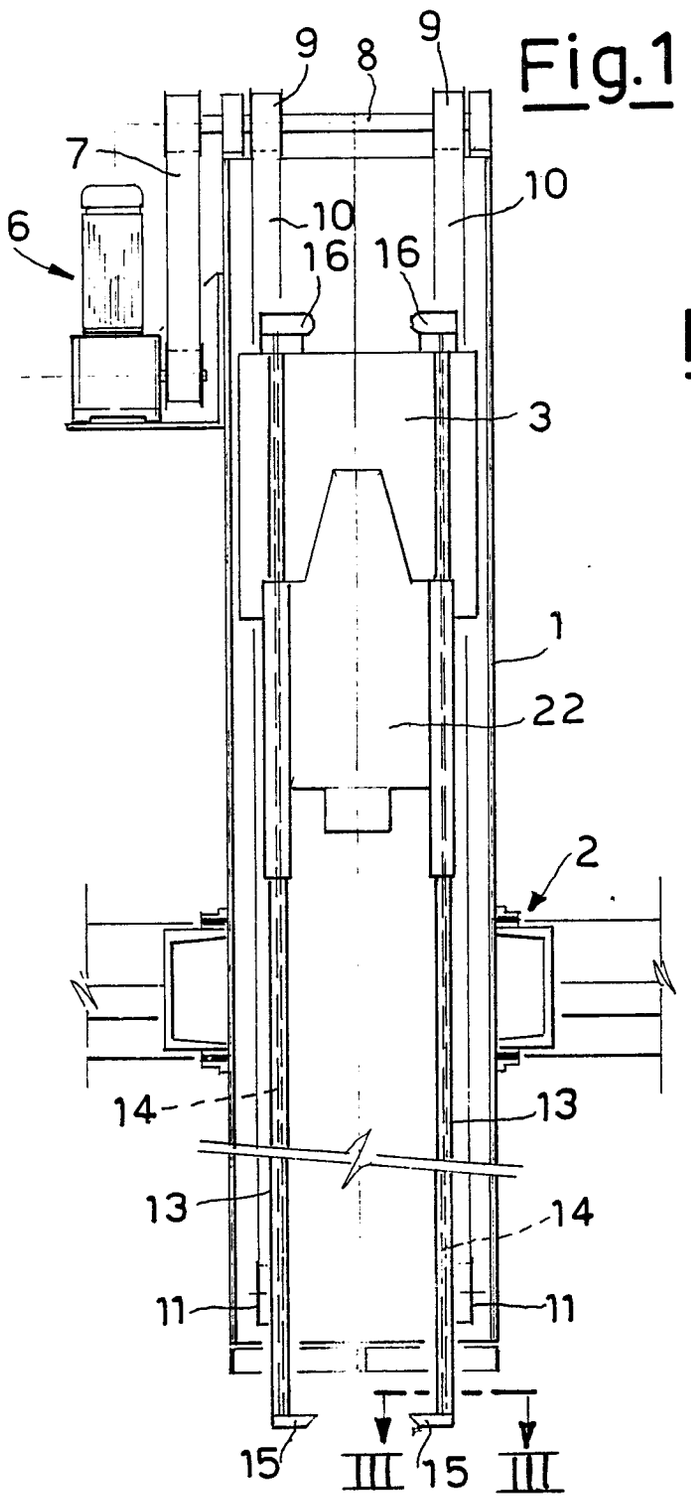


Fig.2

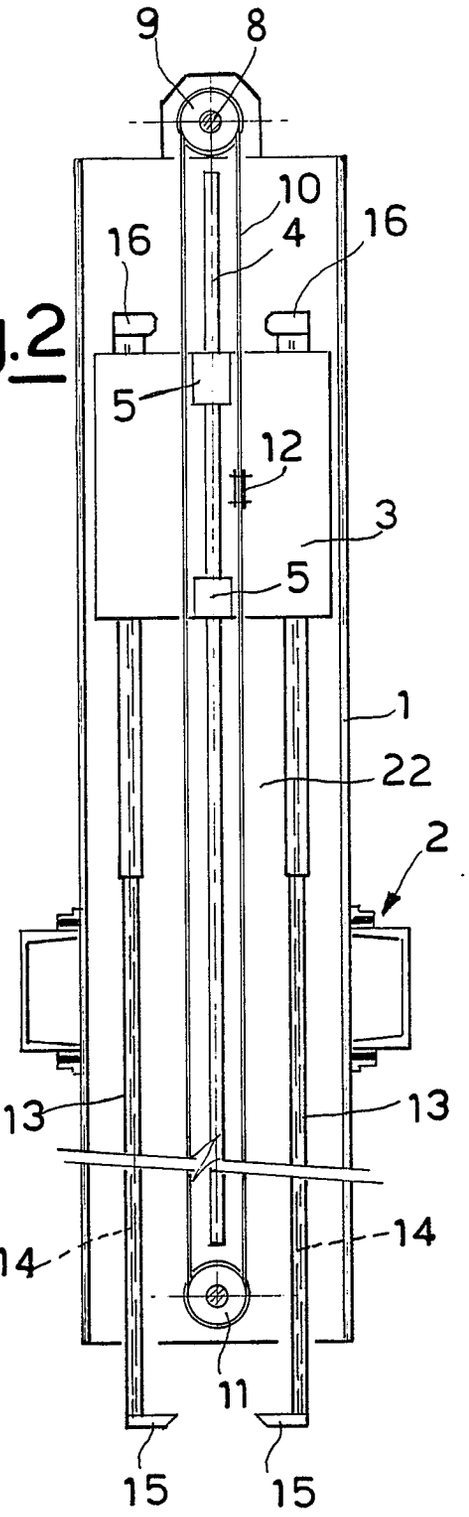


Fig.3

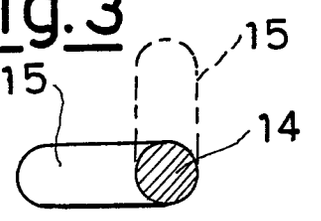


Fig.9

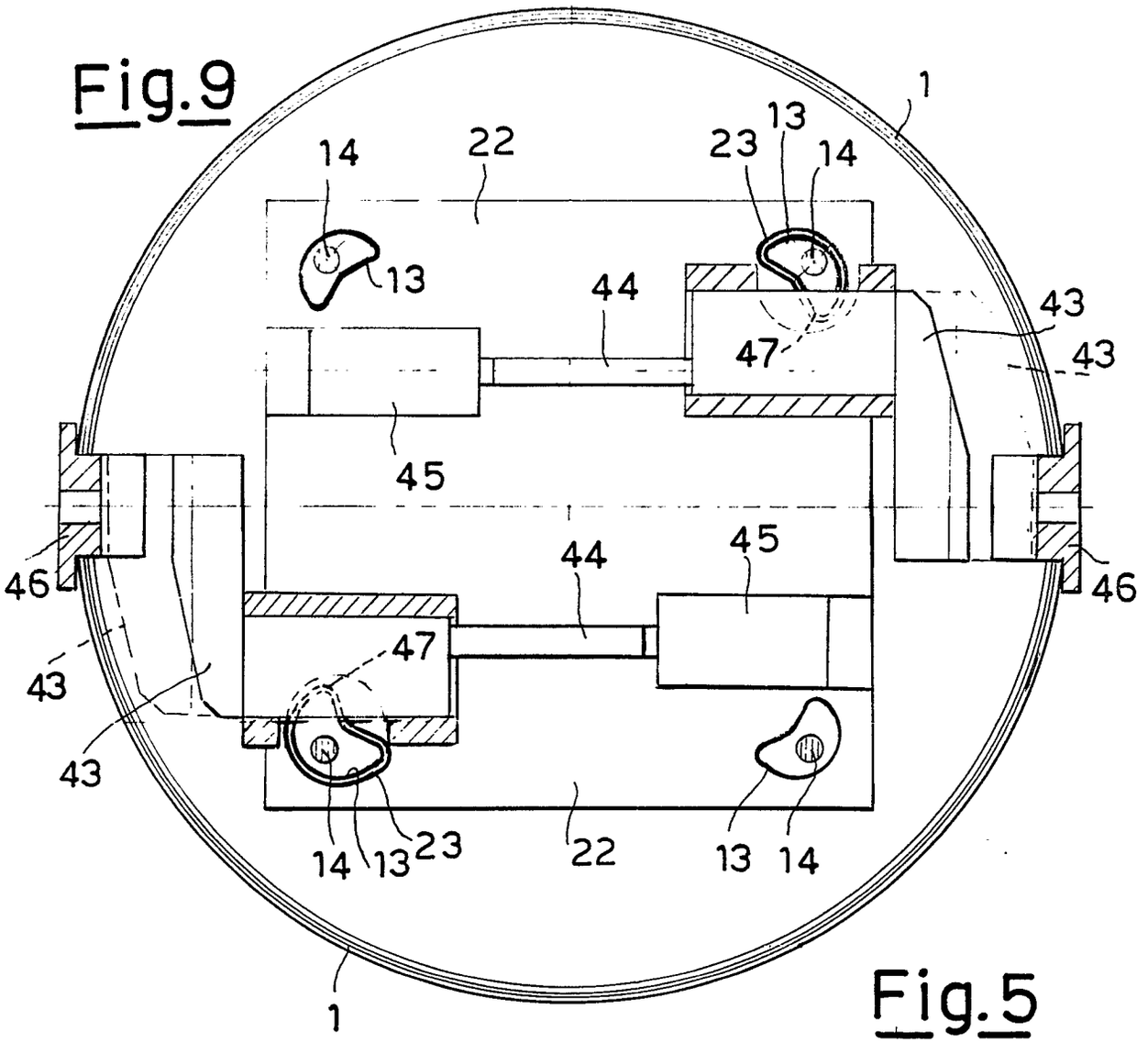


Fig.5

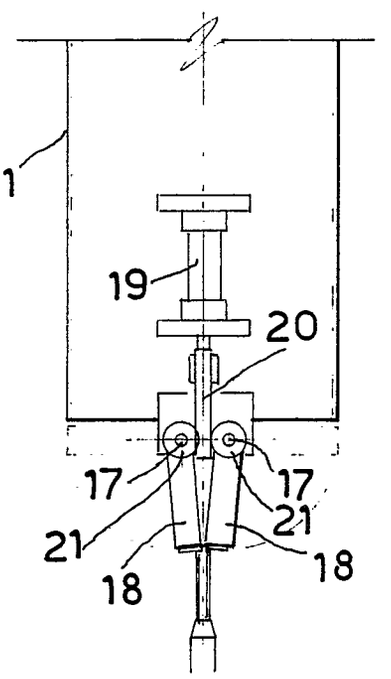


Fig.4

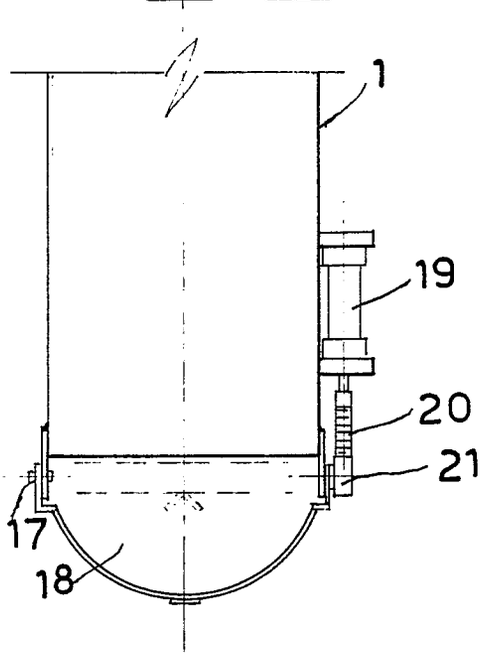


Fig.6

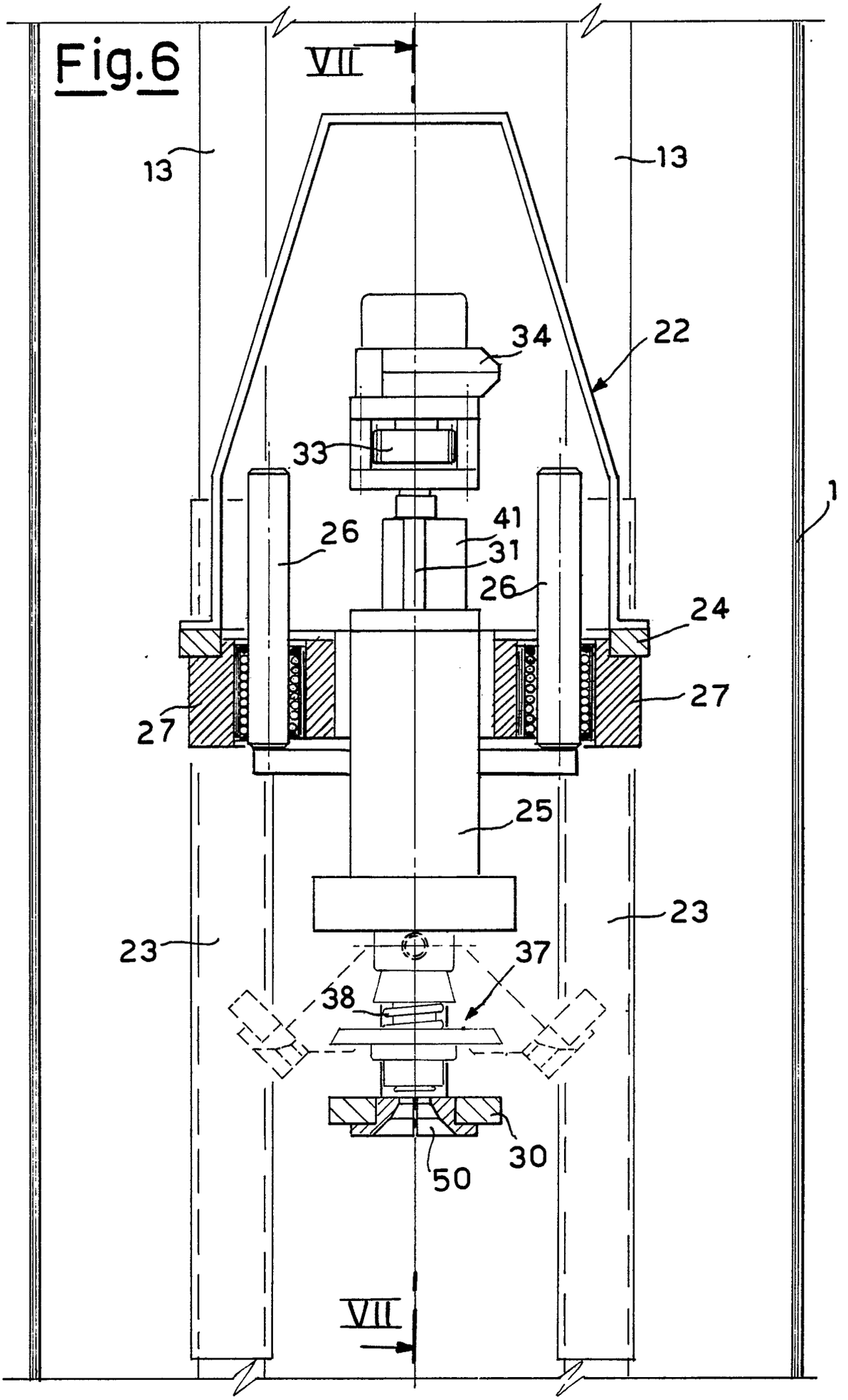


Fig.7

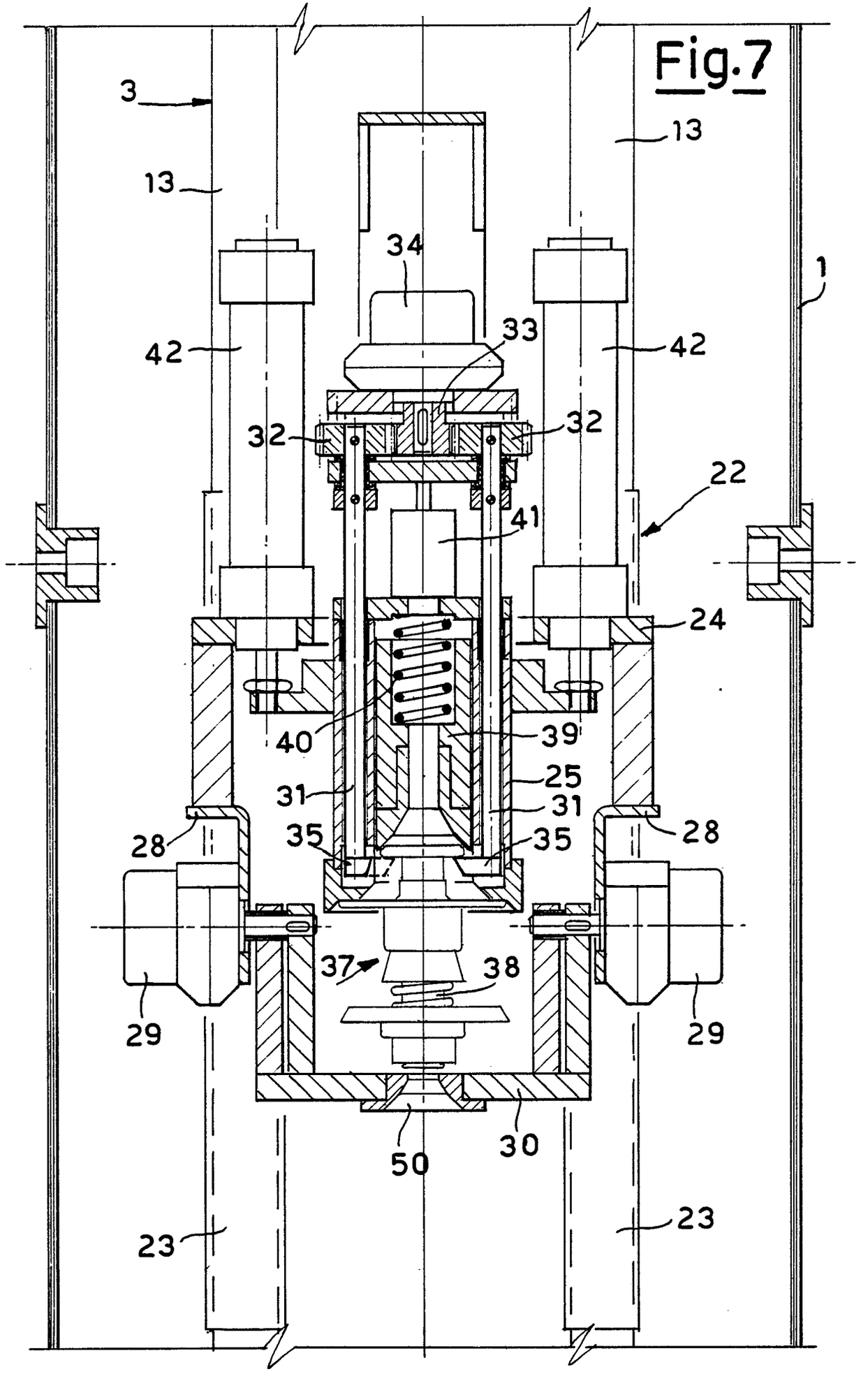

3
13
13
34
1
42
33
42
32
32
22
41
24
40
39
25
31
31
28
35
35
28
37
38
29
29
50
30
23
23

Fig. 8

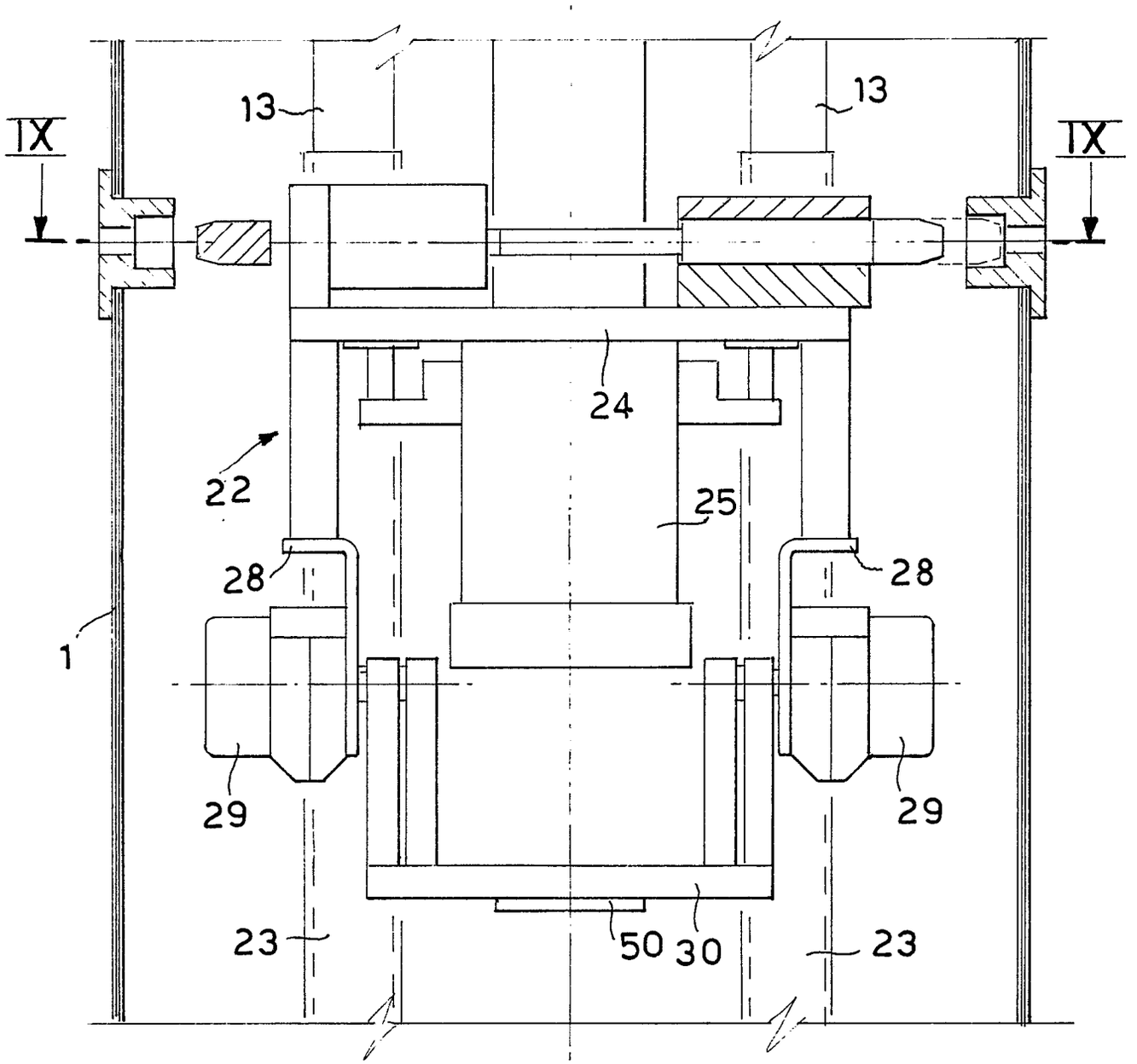


Fig.10

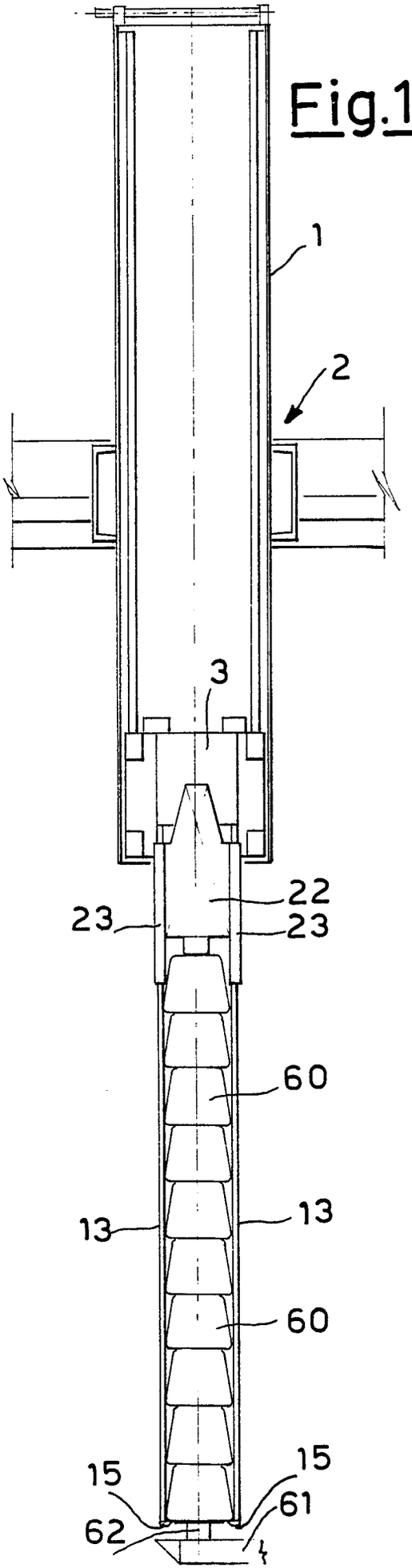


Fig.11