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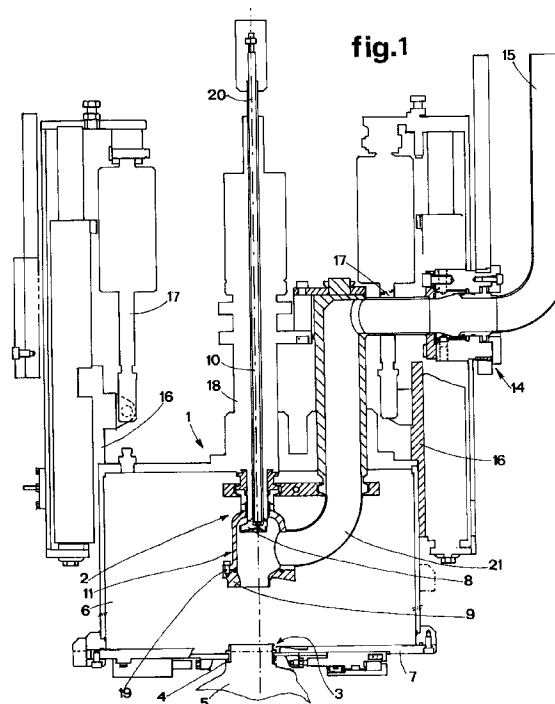
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(54) **Filling head for filling flexible bags under sterile conditions.**

(57) The invention relates to the field of filling machines for flexible containers of the bag type under sterile conditions. More precisely, the invention relates to a header (1) with filler valve (2) comprising means to permit a rotation of about 90° of the said header (1) in such a way that the filler axis turns from the vertical to the horizontal position. The header (1) comprises also interchangeable unions (8) and (9) for the connection between the filler valve (2) and the mouth (4) of the container (5) to be filled.



The object of the invention is a header in a filler machine for flexible bags under sterile conditions.

For fixing internally sterilised or unsterilised bags under sterile conditions, which bags are equipped with mouths which are hermetically closed by a stopper, particular headers are used which have the aim of maintaining conditions of sterility during the filling operation, or, to be more precise, during the phases of: opening the bags by means of the extraction of the stopper from the mouth; filling of the bag with products consisting of liquid, paste or pieces; hermetic closing of the bags by means of reinsertion of the stopper into the mouth.

Such headers are part of filling plants aimed at working with bags of different types and dimensions.

Bag-type containers, housed in appropriate outer containers, are generally positioned on pallets and transported to below the header on a system of rollers.

The mouth of the said bags are usually made of rigid plastic material and are heat-welded to the flexible bag.

With headers of known type, and particularly in the case of tall bags destined to contain 200-250 Kg. of product, there is the drawback of frequent unwelding or tiny cracks forming between the mouth of the bag and the bag itself, with consequent loss of sterility.

Such unwelding is due to the fact that during the filling process, the base of the mouth is disposed on a plane which is substantially perpendicular to the wall of the bag and thus the strain on the base of the mouth tends to produce a partial detachment of the mouth from the walls of the bag.

A further drawback is represented by the fact that it is necessary to have an operator to lift the bag from the outer container in such a way that the product can be completely distributed over the bottom of the bag and thus the formation of "dead zones" in the bag can be avoided.

Aim of the present invention is that of eliminating the above-described drawbacks and in particular of realising a header with filler valve capable of operating both with vertical and horizontal axis.

A further aim is that of permitting of rapid and simple adaptation of the header to mouths of different form, and of avoiding dripping from the header.

A further aim is that of permitting of a complete and automatic filling of the bags, avoiding the necessity for the presence of an operator.

Said aims are fully attained by the header flexible bag filler in sterile conditions, object of the present invention, comprising a filler valve which is inserted into a vertically mobile sterile chamber into which chamber, inferiorly and through an aperture, the mouth of a bag to be filled is introduced, characterised by the fact that it comprises means able to permit of an approximately 90° rotation of the said header at the end of which rotation the said header is positioned

with the wall containing the aperture of the sterile chamber disposed vertically, and with the filling axis substantially horizontal.

These and other characteristics will better emerge from the following description, of a preferred embodiment here illustrated in the form of a non-limiting example, in the accompanying drawings, in which:

- Figure 1 shows the header in vertical section along the filler valve axis;
- Figure 2 shows the header in vertical section in a plane which is perpendicular to that of the preceding figure;
- Figures 3 and 4 show the header in two different operative configurations;
- Figures 5 and 6 show the header schematically in two different operative configurations;
- Figure 7 shows, in a partially sectioned view, a suspension device for the header;
- Figure 8 shows, in a vertical median section, a particular of the suspension device for the header.

With reference to the figures, 1 denotes in its entirety a header of the type used for filling, under sterile conditions, flexible bags 5 equipped with mouths 4.

Obviously the header can be used also for containers which have not been previously sterilised for filling in normal conditions.

The header 1 comprises a sterile chamber 6 having either square or circular transversal section and inferiorly equipped with an aperture 3 through which the mouth 4 of a container is inserted.

The chamber 6 may slide vertically between guides 16 by means of a couple of pistons 17, possibly substituted by a single piston.

In the upper part of the chamber 6, a cylindrical tubular element 18 is sealedly inserted which houses a filler valve 2 equipped with a central stem 10.

A sort of bell 11 is fixed to the part of the tubular element 18 which is internal to the chamber 6, into which bell 11 a product feeder conduit 21 is laterally inserted.

A union 9 is fixed by means of screws 19 to the said bell 11, which union 9 is interchangeable in cases where changes of mouth-shapes are made.

The union 9 kisses perfectly the walls of the mouth with which it comes into contact.

The stem 10, too, is inferiorly equipped with an interchangeable union (8).

In figure 1, two union couples 8 and 9 are illustrated, suitable for two different mouth-forms, to the left of the axis 20 of the valve the unions for a large mouth are shown, while to the right of the axis 20 the unions for a smaller mouth are shown.

A sealed joint 14 permits of the rotation of the header 1 and the filler valve 2 with respect to an external product feeder conduit 15.

Preferably the said rotation is of about 90° and is such to allow the wall 7 of the chamber 6 having the aperture 3 for the introduction of the mouth to be disposed in a substantially vertical position, so that the filler axis is horizontal.

The joint 14 constitutes a means to permit of a 90° rotation of the header, illustrated in figures 3 to 6.

The advantages of such a possibility of rotation consists in being able to avoid damaging orthogonal traction strains between mouth and bag which occur with traditional fixed machine heads with vertical filling axis, for bags equipped with a lateral mouth, normally destined to contain up to 200-250 Kg of product.

With reference to figure 2, 12 denotes an aspirating tube for the liquid accumulated in a collecting groove 13, positioned in proximity to the edges of the chamber 6.

In a possible variant of the embodiment, illustrated by the trace line in figure 2, the aspirating tube 12 can be external to the chamber 6 so that it is easily removable.

The aspirating tube 12 is in this case inserted into a sleeve 31 which connects it to a suction conduit in the collecting groove 13.

The tube 12 and the groove 13 constitute aspirating and discharging means for the condensation or liquid collected in the chamber 6.

Said means are particularly important in that in this way dripping of the vapour or sterilising fluid is avoided, and thus corrosion of the metallic outer containers in which the bags 5 are normally housed is also avoided, as is the fouling of the bags 5 themselves.

In cases where cardboard outer containers are used, dripping of condensation causes the weakening and perishing of the cardboard.

The chamber 6 houses also a second bell 22, which bell 22 is turn houses internally gripping means 32 for the extraction of the stopper from the mouth; said bell 22 permits of effecting sterilisation in a smaller space 37 with respect to the entire chamber 6.

The bell 22, through means which permit of its lifting and rotation, can be raised up to a position indicated by a dotted line in figure 2, and can be moved into another position internally to the chamber 6 to allow the first bell 11 to be lowered.

When the bell 22 is sealedly pressed on the bottom of the chamber 6, the space 37, of considerably smaller volume than the entire chamber 6 can be sterilised by means of the immission of steam or other sterilising fluid.

The steam or sterilising fluid enters into the bell 22 through a conduit 33 which finishes in a plurality of nozzles 34 arranged on an interchangeable ring 35.

36 denotes an entrance for the steam or sterilising fluid for the sterilisation of the entire chamber 6.

Figures 5 and 6 illustrate respectively, the cases of a single large bag of about 1000kg of product

housed in a container and transported on a pallet 23 to below the header 1, and of four containers 38 on pallets (of which only two are illustrated) each of which containers 38 houses a bag which bag can contain up to 200-250 kg of product.

The particular position of the joint 14, that is, the centre of rotation of the header 1 is such that when the header 1 has its filling axis vertical it is able to fill the 1000 kg bag, whereas when it is turned so that its filling axis is horizontal, it is able to fill the four 200-250 bags automatically.

In this last case, in order to fill the four 200-250 kg bags, the support pallet 23 performs 90° rotations between consecutive fillings in such a way that it brings each bag in turn into the correct filling position below the header 1.

With reference to figures 7 and 8, 24 denotes a suspension device for the header 1 with its filling axis substantially horizontal, applicable in the case of bags able to contain up to 200-250 kg of product.

The device 24 comprises a piston 25, connected inferiorly to the header 1 and slidable internally to a cylindrical body 27, in which it is kept elastically pressed upwards by a spring 26.

A threaded closing element 28 is inferiorly screwed into the body 27, which closing element 28 regulates the spring 26 loading.

When the filling operation begins, the header 1 is held upwards to permit the bag to remain partially raised from the bottom of the container in which it is inserted.

In the first, slow phase of filling, the introduction of a certain amount of product, generally 30-50 kg., overcomes the spring 26 loading, and causes the descent of the piston 25 until a striker 29 causes the activation of a microswitch 30 which microswitch 30 sets into motion a second, fast filling phase, with a greater volume in kg/s of product.

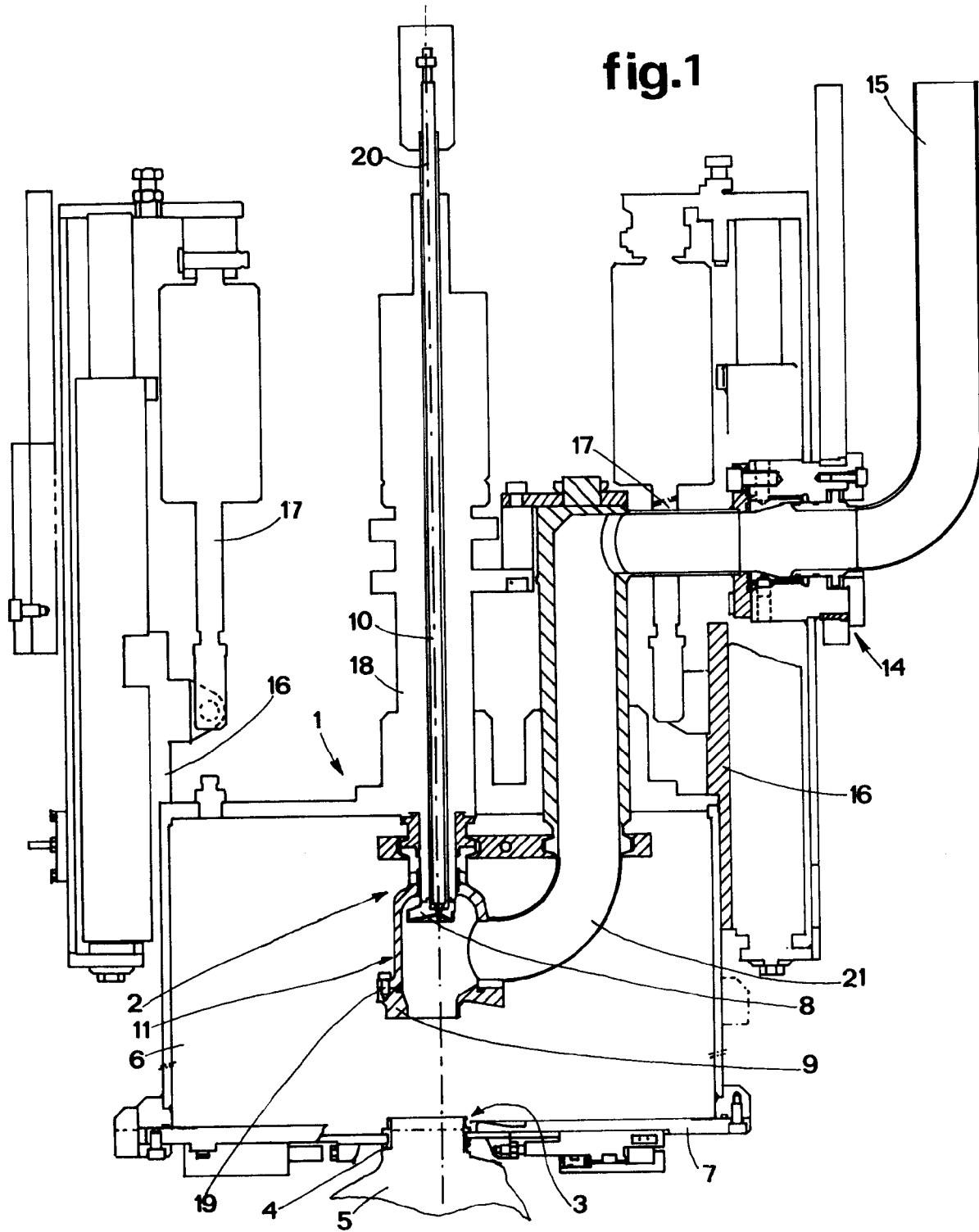
The device 24 makes uniform and complete filling of the bags possible, without the need for the intervention of an operator to keep the bag raised at the beginning with respect to its container.

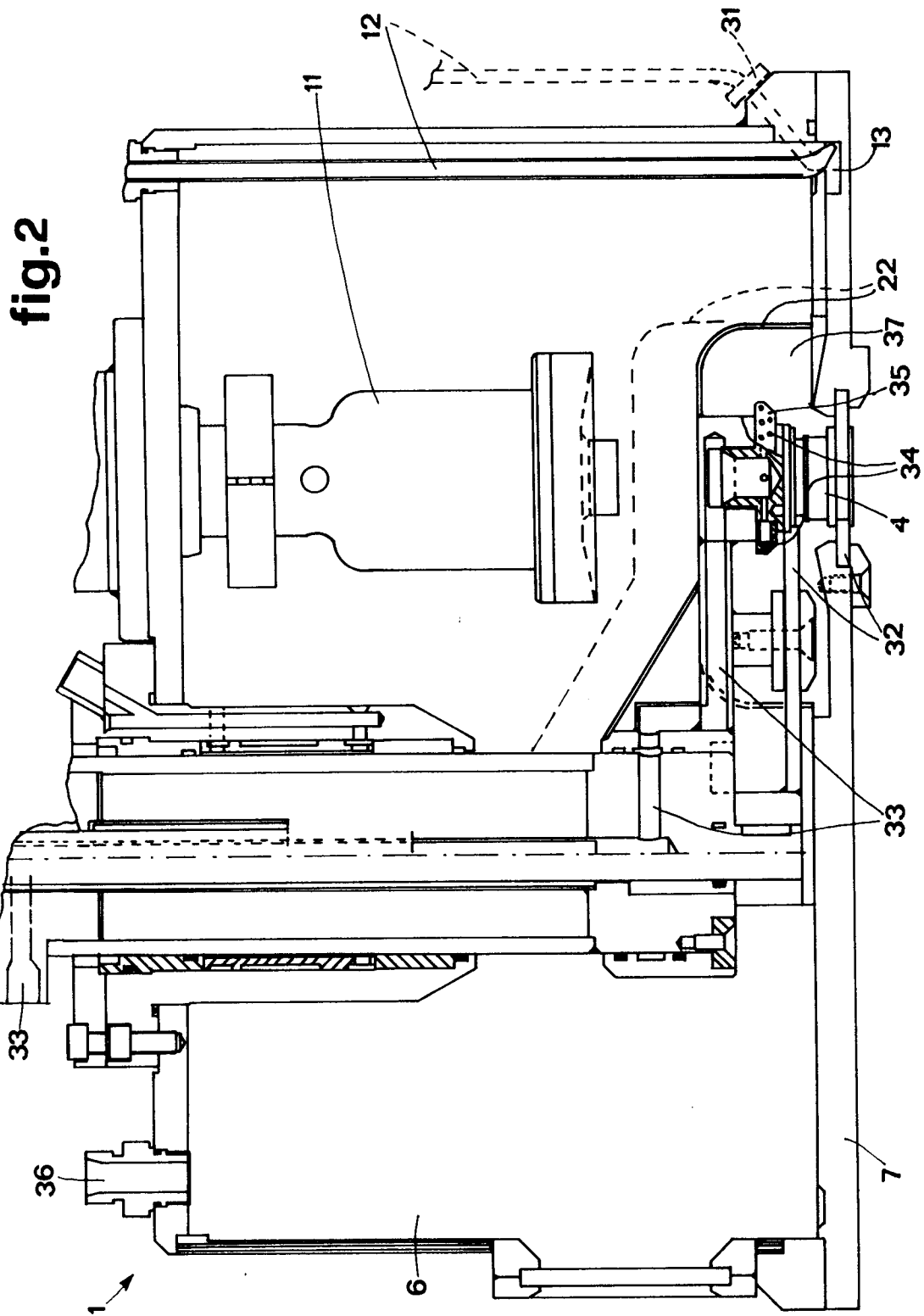
## Claims

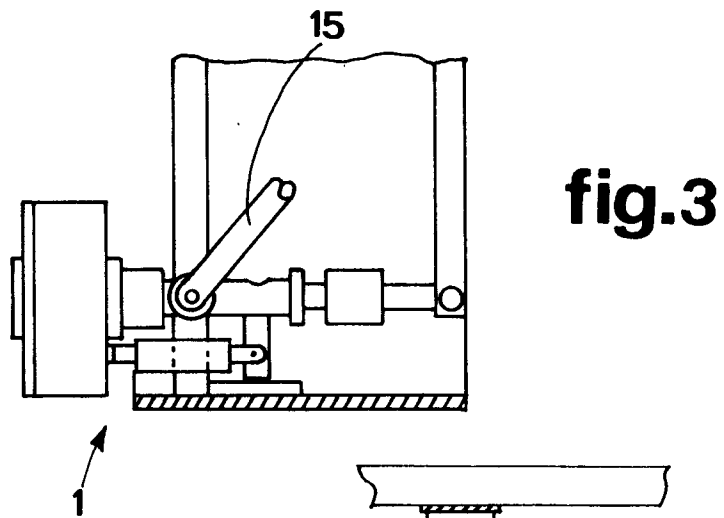
1. A header in a filler machine for flexible bags under sterile conditions, comprising a filler valve (2) which is inserted into a vertically mobile sterile chamber (6), into which said chamber (6) the mouth (4) of a bag (5) to be filled is inferiorly introduced; characterised by the fact that it comprises means to permit a rotation of about 90° of the said header (1) at the end of which rotation the said header (1) is positioned with the wall (7) containing the aperture (3) of the sterile chamber (6) vertically disposed, and with the filling axis (20) substantially horizontal.

2. A header as in claim 1, wherein the means to permit of a 90° rotation of the said header (1) comprise a sealed joint (14) to permit of rotation of the header (1) with respect to the product feeder conduit (15). 5
3. A header as in claim 1, comprising interchangeable unions (8) and (9) for the connection between the filler valve (2) and the mouth (4). 10
4. A header as in claim 3, comprising an interchangeable union (8) fixed to the stem (10) of the said filler valve (2), and an interchangeable union (9) fixed to a bell (11) destined to come into contact with the said mouth (4) during the filling operation. 15
5. A header as in claim 1, comprising aspirating means for condensation and liquid which may accumulate in the said chamber (6), which means are constituted by an aspirating tube (12) to aspirate the said liquid from a groove (13 situated in proximity to the edges of the said chamber (6) which groove (13) collects the liquid to be aspirated. 20 25
6. A header as in claim 1, comprising a bell (22) which constitutes a sealed closes environment (37) internally to the said chamber (6), said bell (22) being equipped with means to permit of vertical and lateral movement, having housed internally to it gripping means (32) for the mouth (4) and a ring (35) equipped with a plurality of nozzles (34) through which sterilising steam and fluid are introduced internally to the said bell (22) and said environment (37). 30 35
7. A header as in claim 1, characterised by the fact that is comprises a device (24) for the elastic suspension of the header (1) having a substantially horizontal filling axis, said device (24) being constituted by a piston (25) housed in a cylindrical body (27) and connected to the header (1), said piston (25) being kept in an upwards pressed position by a spring (26) with regulatable load, and said piston (25) lowering when the bag (5) reaches a prefixed weight during the filling operation and thus permitting of the lowering of the said header (1). 40 45 50

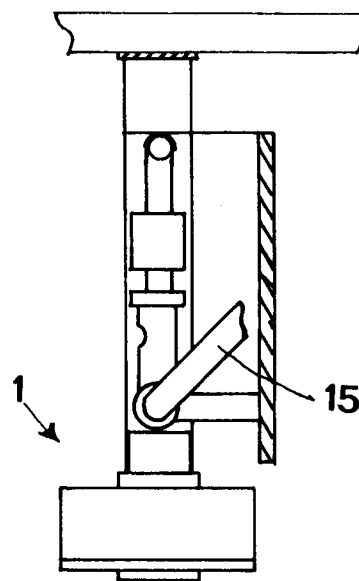
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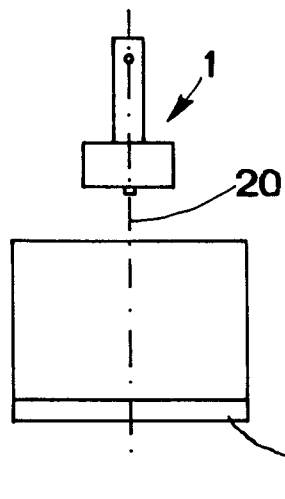




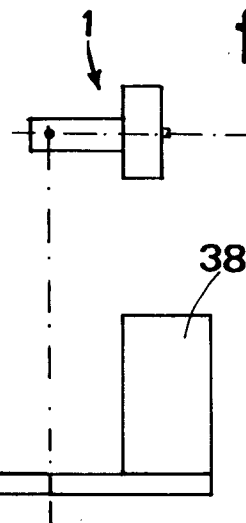
**fig.4**

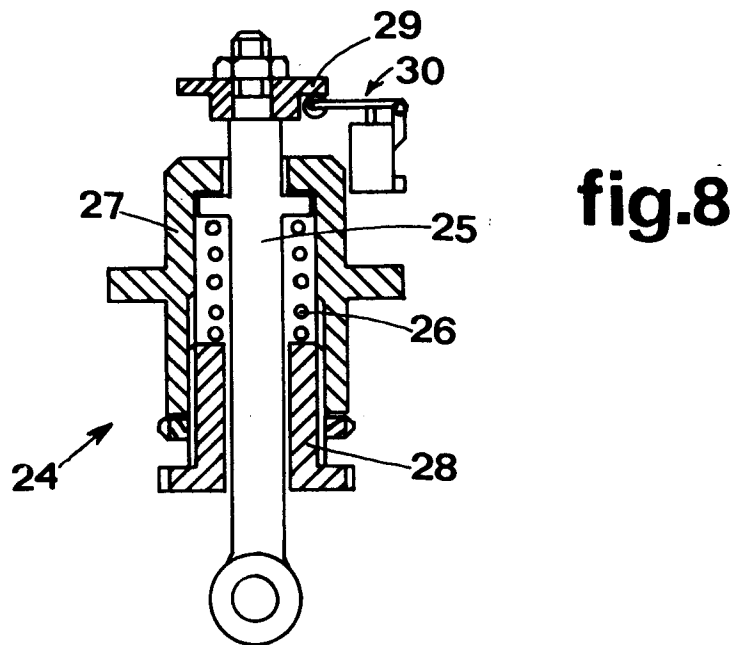
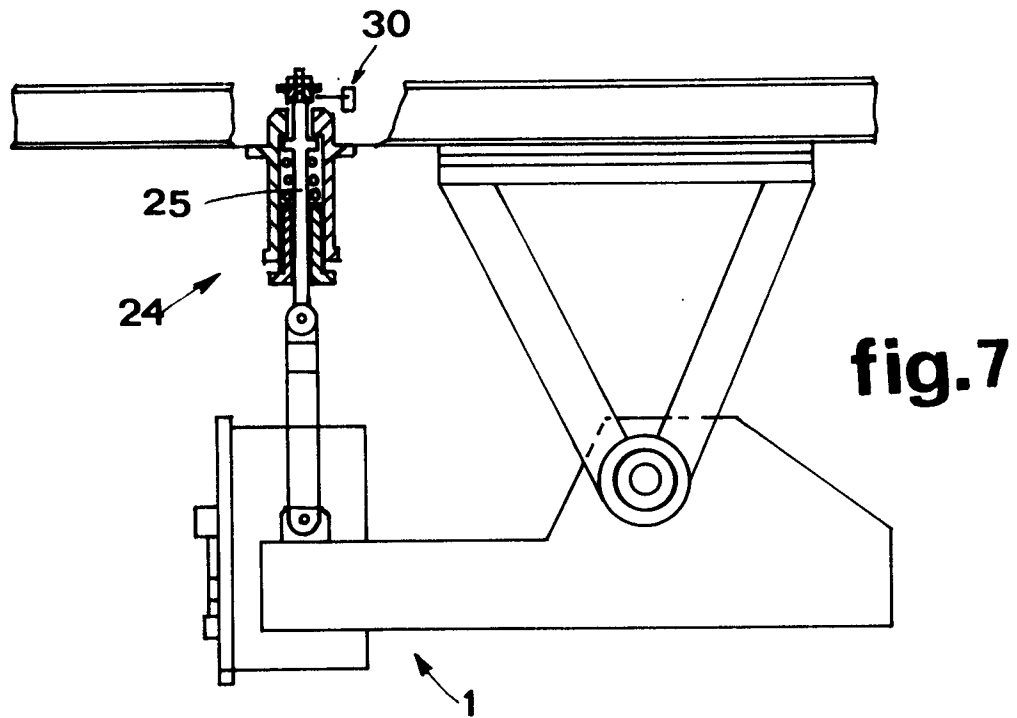


**fig.5**



**fig.6**









European Patent  
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# EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0007

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)
Y	US-A-4 524 563 (C. SASSI) * Column 3, line 12 - column 4, line 12; figures 1,2,5-9 *	1,3,5,6	B 65 B 55/02
Y	EP-A-0 088 735 (EL.PO) * Page 3, line 24 - page 4, line 7; figure 1; page 8, lines 15-22; figure 7 *	1,3,5,6	
Y	US-A-4 893 733 (THOMSEN) * Abstract; figure 1 *	3	
Y	EP-A-0 115 963 (SCHOLLE) * Page 7, lines 5-33; page 11, lines 3-26; figures 1,2,4A-4C *	6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29-05-1992	Examiner CLAEYS H.C.M.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>I : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			

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