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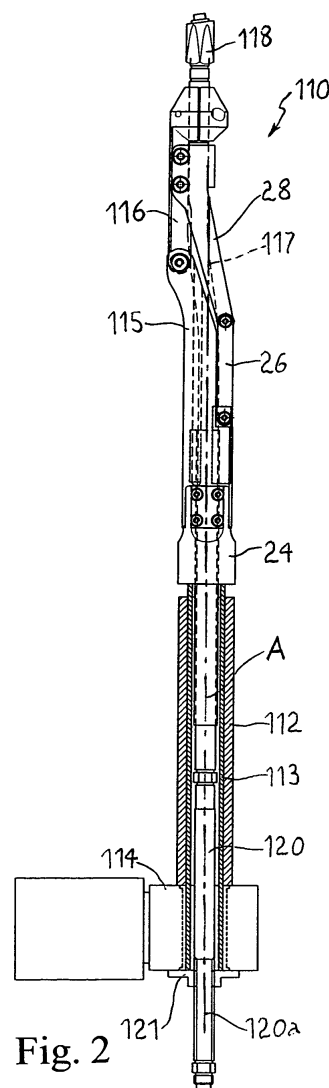
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(54) **A device for internally scouring barrels such as wooden caskets or barriques**

(57) A hollow shaft (113) is provided with a hinging projection (115) at one of its ends, to which a boom (116) having an operative free end is pivoted. A hose (117) is slidably received within the hollow shaft (113) and has an outlet end (118) anchored to the operative end of the boom (116) and an inlet end connected to pressurized fluid supplying means. A slide (122) is integral with the hose (117) and is slidably supported in a longitudinal direction with respect to the hollow shaft (113) under control of translation driving means (114, 121). The slide (122) and the boom (116) are interconnected via rigid linkages (26) arranged to change the translatory motion of the slide (122) into a rotary motion of the boom (116) about the pivot axis thereof.



## Description

**[0001]** The present invention relates to a device for internally scouring barrels, in particular wooden caskets, barriques, and the like.

**[0002]** In order to improve the flavor of wines, the latter are subjected to refining cycles in wooden caskets or barriques of variable capacity, typically a few hundred liters. After emptying a barrel at the end of a cycle, and before a fresh filling, the interior surfaces of the barrel should be accurately scoured in order to remove the lees that have been deposited during the previous cycle, which lees would affect the quality of the wine to be treated in the new cycle.

**[0003]** Such scouring step is difficult to carry out, because access to the inside of the barrel can only be had through a bung hole, also known as "cocchiame", of 4 to 5 cm diameter.

**[0004]** To this purpose, EP-A-1531010 of Applicant discloses a barrel-scouring device by which the interior surface of the barrel can be energetically scoured without leaving blind spots, with concentration of the scouring action on the most critical spots, in particular the corners between the ends and the side wall of the barrel.

**[0005]** The device described in EP-A-1531010 is diagrammatically shown in Fig. 1 and comprises a hollow shaft insertable through the bung hole of the barrel and driven to rotate by a gearmotor. The upper end of the hollow shaft has a fork attached thereto, which has a boom pivoted to its free end. A hose is slidably received within the hollow shaft and is provided with an ejecting nozzle attached to the free end of the boom. The hose is biased against the pivot of the boom by a U-shaped spring member that is arranged obliquely astride the hose and has its free ends attached to the boom. The inlet end of the hose is connected to a fluid-supply source via a union pipe having a threaded portion in roto-translation engagement with a flange integral with the gearmotor. The hose is partially lined with a rigid liner.

**[0006]** In the scouring step, the device is inserted into the barrel through the bung hole, and water is supplied to the device by connecting a pump to the union pipe, so that a jet is ejected from the nozzle. By operating the gearmotor, the hollow shaft and the boom are driven to rotate. This rotation, via the hose, is applied to the union pipe, which cooperates with the stationary flange to move axially and to push up the hose, which consequently is led to bend progressively, thereby driving the boom to swivel. The U-shaped spring member has the essential function of guiding the hose to properly bend, in order to allow the boom to perform a full rotation of about 180°. Such rotation of the boom, together with the rotation about the axis of the hollow shaft, sweeps the nozzle through a spherical path, whereby the jet will impact the entire internal surface of the barrique.

**[0007]** Therefore, with the above device, the hose also performs the mechanical function of driving the boom to progressively swivel about its pivot axis, i.e., it operates

as a transmission member which changes the axial motion of the union pipe into a rotary motion of the boom. This circumstance may cause premature wearing, and consequently breaking, of the hose, mainly in the area where the U-shaped spring member rubs against the hose, as well as in the inner side of the bent hose, mainly in consideration of the relatively small bending radius of the hose.

**[0008]** Furthermore, since the boom is driven to swivel by the flexible hose, the kinematic system is not completely rigid and it does not provide an absolute certainty of position. This circumstance also limits the possibility of installing relatively long booms, e.g. for scouring large-sized barrels, because in this case the hose is not rigid enough to oppose both the centrifugal force applied to the boom and the weight of the latter.

**[0009]** Therefore, it is a main object of the present invention to provide a barrel-scouring device of the type described in the above-cited European patent application, which is enhanced in such a way as to provide a higher reliability and sturdiness as well as an improved certainty of position.

**[0010]** It is another object of the invention to provide a device which can be manufactured in an unexpensive way, even by updating the above-described known devices.

**[0011]** The above objects and advantages, which will better appear below, are achieved by the device for internally scouring barrels which has the features recited in claim 1, while the dependent claims state other advantageous, though secondary features of the invention.

**[0012]** The invention will be now described in more detail, with reference to a preferred, non-exclusive embodiment, shown by way of non limiting example in the attached drawings, wherein:

Fig. 1 is a diagrammatical view in side elevation of a barrel-scouring device according to the prior art;

Fig. 2 is a view in side elevation of a barrel-scouring device according to the invention;

Fig. 3 is a plan view to an enlarged scale of a portion of the device of Fig. 2, which is improved with respect to the prior art shown in Fig. 1;

Fig. 4 is a view in side elevation of the portion of device of Fig. 3;

Fig. 5 is a broken-away view to an enlarged scale of a detail of Fig. 4;

Fig. 6 is a view in cross-section of Fig. 5 made along line VI-VI;

Fig. 7 is a view similar to Fig. 4, showing the device in a different configuration.

**[0013]** With initial reference to Fig. 1, a scouring device 10 according to the prior art comprises an elongated support 12 arrangeable in a fixed position with respect to a general barrique, with an end portion insertable through the bunghole. A hollow shaft 13 is pivotally supported within elongated support 12 and is driven to rotate by a gearmotor 14. The upper end of hollow shaft 13 integrally bears a hinging projection in the shape of a fork 15 having a boom 16 pivoted thereto. A flexible hose 17 is slidably received within hollow shaft 13 and has an outlet end provided with a nozzle 18 anchored to an operative free end of boom 16. Hose 17 is biased against the hinging area of boom 16 by an U-shaped spring member 19 which is arranged obliquely astride hose 17 and has its free ends attached to boom 16. The inlet end of hose 17 is connected to a fluid-supply source via a union pipe 20 having a threaded portion 20a in roto-translation engagement with a stationary, hollow flange 21 integral with gearmotor 14. Hose 17 is partially lined with a rigid liner 22.

**[0014]** Fig. 2 illustrates an improved scouring device 110 according to the invention, where the parts corresponding to the prior art of Fig. 1 are referred to by using the same reference numbers augmented with 100. In a way similar to the prior art, in the device according to the invention hollow shaft 113 supports a joint 24 at one of its ends, having a hinging projection screwed thereto in the shape of a fork 115. A boom 116 is pivoted to fork 115 at a position spaced from the axis of rotation A. In a way similar to the prior art, a hose 117 is slidably received within hollow shaft and is provided with an ejecting nozzle 118 anchored to a free end of boom 116. The inlet end of hose 117 is connectable to a fluid-supply source via a union pipe 120 having a threaded portion 120a in roto-translation engagement with a flange integral with gearmotor 114. Hose 117 is partially lined with a rigid liner 122 that is integral with the hose and is slidably received within hollow shaft 113.

**[0015]** The device according to the invention differs from the prior art mainly in that boom 113 is linked to rigid lining 122 surrounding the hose via a pair of parallel connecting rods 26. Connecting rods 26 each have one end hinged to a lever 28, which projects integrally and obliquely from the boom and terminates on the opposite side of the axis of rotation A of the hollow shaft with respect to the area where boom 116 is pivoted to fork 115, and the opposite end hinged to a base 30, which is slidable between the two arms B1, B2 of fork 115 (Figg. 5, 6) and is screwed to liner 122. A spacer 31 (Fig. 3) is arranged between the two connecting rods at the area where they are hinged to lever 28, and has the shape of a roller with a concave profile so that it will not interfere with hose 117. In a position diametrically opposed to base 30, liner 122 has a shoe 32 screwed thereto, which has two lateral ridges 32a, 32b which slidably engage respective rectilinear grooves 115a, 115b formed on the inner walls of the arms of fork 115 in order to guide liner 122 to move axially, which liner acts as a slide for hose 117.

Base 30 and shoe 32 have the further aim of preventing liner 122 from rotating with respect to fork 115. Near joint 24, liner 122 is guided to translate between a pair of opposite rollers such as 34 (Fig. 3).

**[0016]** The operation of the device is very similar to the operation of the known devices of the above-mentioned type. The device is inserted into the barrique through the bunghole with the boom extending longitudinally. Water is then supplied to the device by connecting a pump (not shown) to union pipe 120. The liquid passes through union pipe 120 and hose 117, and is ejected from nozzle 118 as a single high-pressure jet. By operating gearmotor 114, boom 116 is driven to rotate about axis A. This rotation is applied to the threaded portion 120a of union pipe 120 via hose 117, that is integral with boom 116, and liner 122. Via base 30 and shoe 32, this rotation about axis A also is rigidly transmitted to fork 115. Union pipe 120, by cooperating with stationary flange 121, moves axially and transmits its axial motion of roto-translation to the portion of the hose which is lined with rigid liner 122. As shown in Fig. 7, via connecting rod 26 the motion of liner 122 causes boom 116 to progressively swivel, while it simultaneously rotates about axis A, to a position that is substantially rotated of 180°. Such progressive rotation of boom 116, together with the rotation about axis A, sweeps the nozzle through a spherical path, whereby the jet will impact the entire internal surface of the barrique.

**[0017]** As the person skilled in the art will immediately understand, with the device according to the invention, unlike the prior art shown in Fig. 1, boom 116 is progressively driven to rotate via rigid linkages consisting of connecting rods 26 that cooperate with stationary arm 28, instead of via flexible hose 117. This rigidity of the kinematic system provides the device with an improved certainty of position and reliability, even when relatively long booms are installed.

**[0018]** This circumstance lead to the further advantage that the hose, in the portion between the outlet end of the rigid liner and the nozzle, does not have to be guided in order to match a predetermined bent configuration and, consequently, it is free to bend with a bending radius that can be greater than the known devices of the type of Fig. 1. This improves the sturdiness of the device because the hose is prevented from premature wearing by fatigue or friction against any guiding means.

**[0019]** A preferred embodiment of the invention has been described herein, but of course many changes may be made by a person skilled in the art within the scope of the claims. For instance, a single connecting rod could be used instead of a pair of parallel connecting rods. More generally, the single connecting rod or the pair of connecting rods could be replaced by other rigid linkages for changing the translatory motion of the slide into a rotary motion of the boom, e.g., by providing the rigid liner with a rack and the boom with a gear meshing with the rack. Nevertheless, the displacement of the rigid liner could be made independent from the rotation of the hollow shaft,

i.e., they could be respectively operated by translation driving means and rotation driving means independent from each other.

## Claims

### 1. A device for internally scouring barrels, comprising

- a hollow shaft (113) provided with a hinging projection (115) at one of its ends,
- a boom (116) hinged to said hinging projection (115) and having an operative free end,
- a hose (117) that is slidably received within said hollow shaft (113) and has a outlet end (118) anchored to the operative end of the boom (116) and an inlet end connected to pressurized fluid supplying means,
- a slide (122) integral with the hose (117) and slidably supported in a longitudinal direction with respect to the hollow shaft (113) under control of translation driving means (114, 121),

**characterized in that** said slide (122) and said boom (116) are interconnected via rigid linkages (26) arranged to change the traslatory motion of the slide (122) into a rotary motion of the boom (116) about the pivot axis thereof.

### 2. The device of claim 1, **characterized in that** said rigid linkages comprise at least one connecting rod (26) linked between said boom (116) and said slide (122).

### 3. The device of claim 2, **characterized in that** said at least one connecting rod (26) has one end hinged to a lever (28) integral with the boom (116) and the opposite end hinged to said slide (122).

### 4. The device of any of claims 1 to 3, **characterized in that** said slide consists of a rigid liner (122) surrounding a portion of the hose (117) and slidably received within the hollow shaft (113).

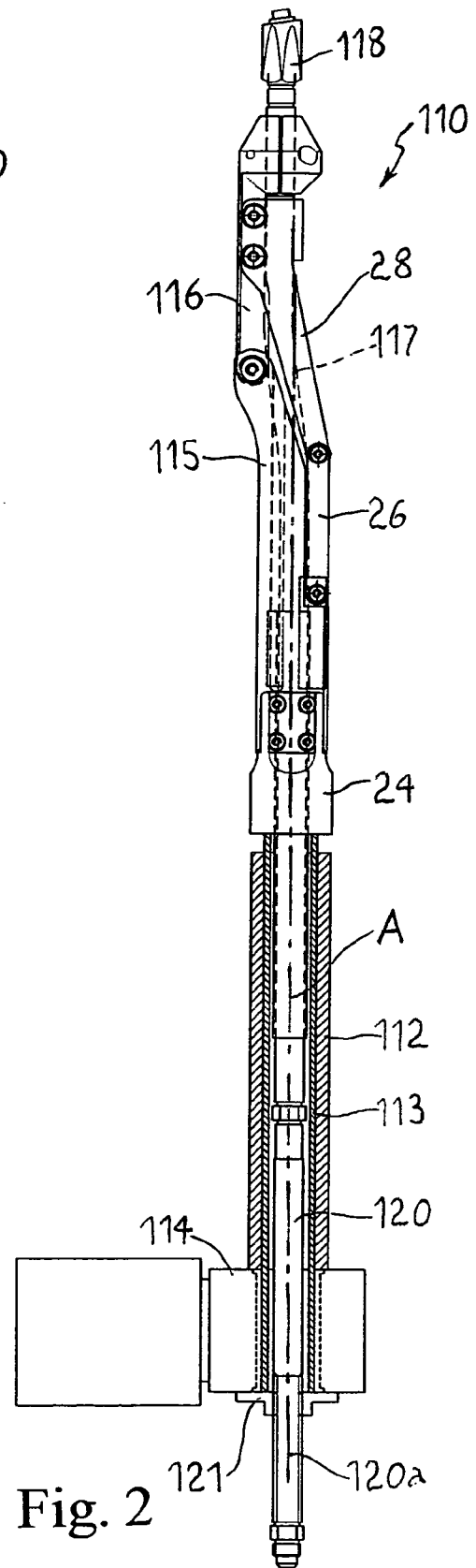
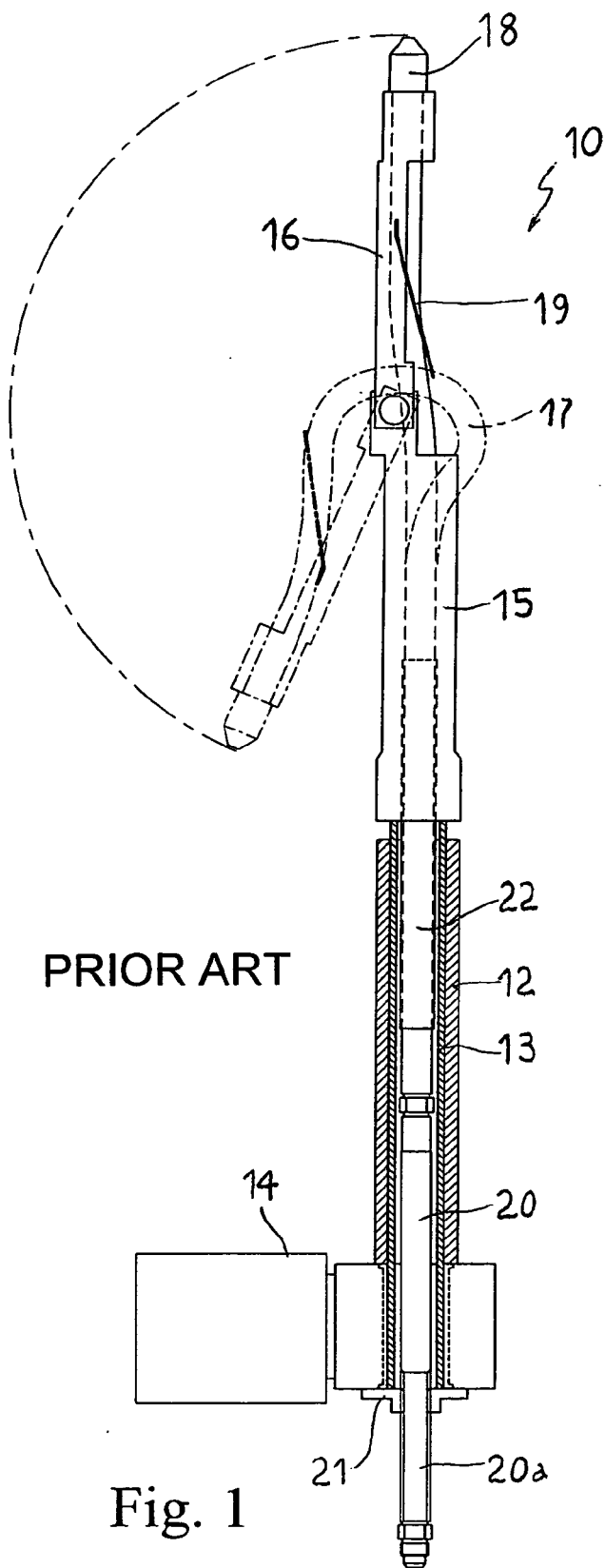
### 5. The device of claim 4, **characterized in that** it comprises guiding means arranged to guide said liner to move axially (122) with respect to the hollow shaft (113) and to prevent the liner from rotating with respect to the hollow shaft.

### 6. The device of claim 5, **characterized in that** it comprises two spaced walls (B1, B2) integral with the hollow shaft (113), between which said slide (122) is slidable, and said guiding means comprise a shoe (32) attached to the liner (122) and provided with lateral ridges (32a, 32b) which slidably engage respective rectilinear grooves (115a, 115b) formed on said walls.

### 7. The device of claim 6, **characterized in that** said connecting rod (26) is linked to said slide (122) via a base (30) that is anchored to the liner (122) in a position diametrically opposed to the shoe, and is slidably received between said walls (B1, B2) to prevent the liner from rotating with respect to the hollow shaft.

### 8. The device of any of claims 1 to 7, **characterized in that** said hollow shaft (113) is supported to axially rotate under control of driving means (114).

### 9. The device of claim 8, **characterized in that** said translation driving means comprise a union pipe (120) connected to the inlet end of said hose (117) and having a threaded portion (120a) engaging a corresponding threading formed on a stationary body (121) integral with the housing of said driving means (114).



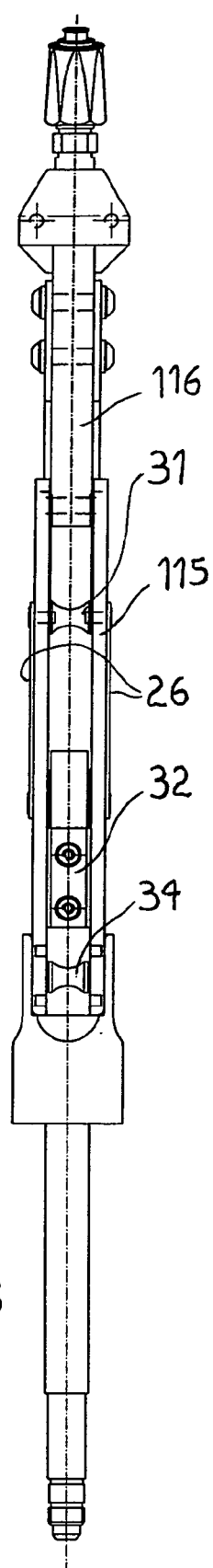


Fig. 3

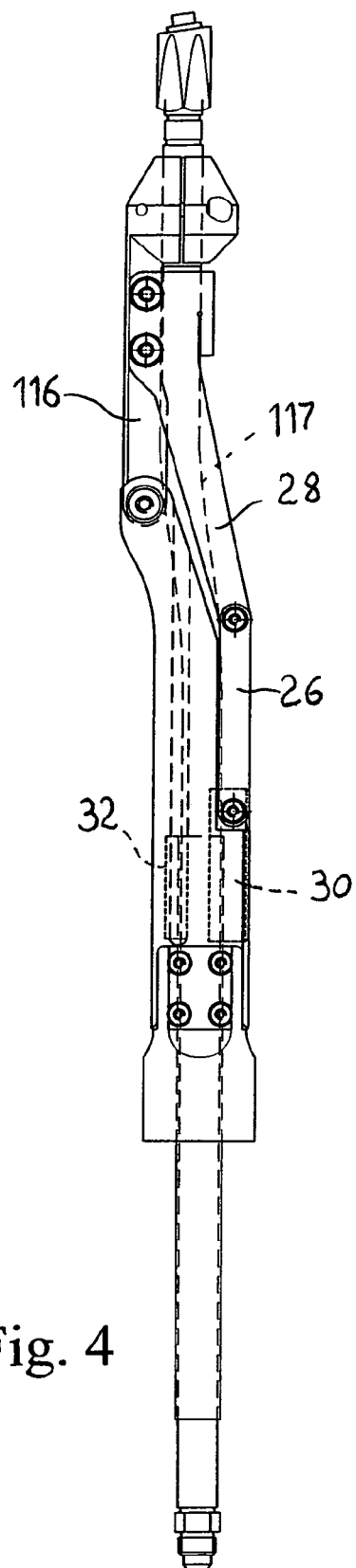


Fig. 4

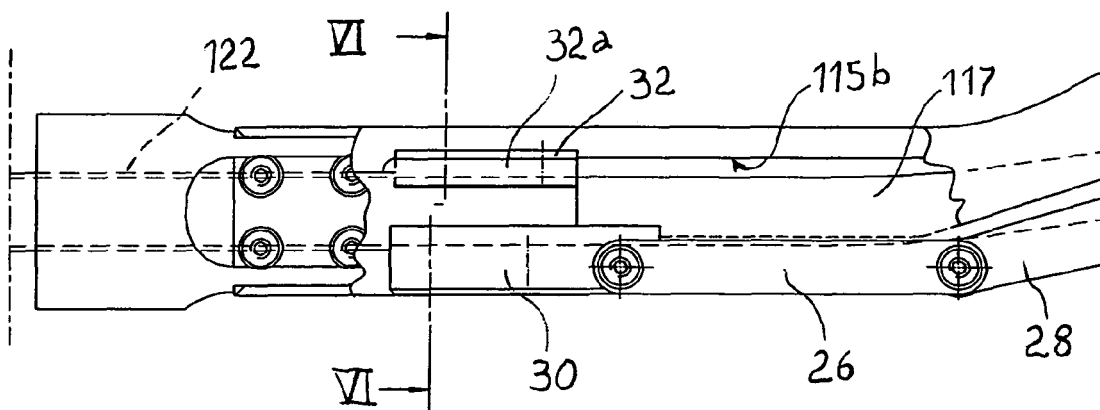


Fig. 5

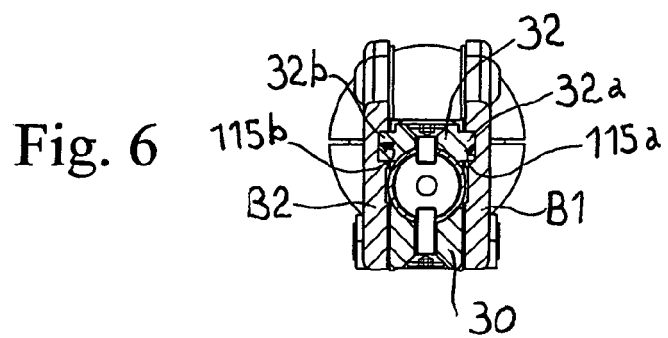


Fig. 6

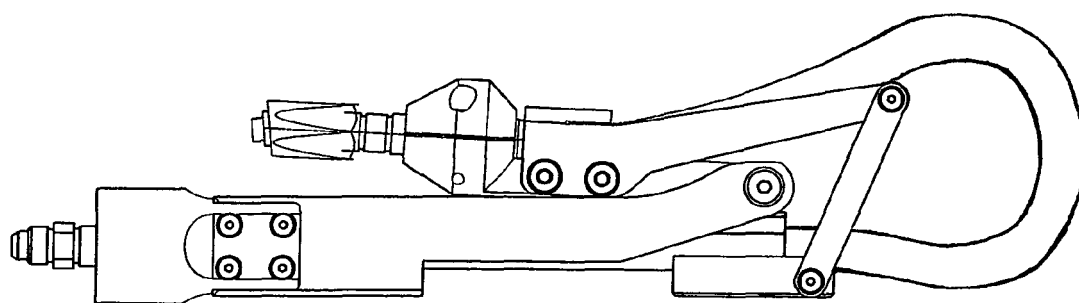


Fig. 7



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 07 42 5396

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                   |                                  |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Citation of document with indication, where appropriate, of relevant passages                                     | Relevant to claim                | CLASSIFICATION OF THE APPLICATION (IPC)                 |
| X,D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | EP 1 531 010 A (GALANDRINO AGOSTINO [IT])<br>18 May 2005 (2005-05-18)<br>* figure 1 *                             | 1                                | INV.<br>B05B13/06<br>B05B15/06<br>B08B9/08<br>B08B9/093 |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -----<br>US 2005/045751 A1 (NANCE THOMAS A [US] ET AL) 3 March 2005 (2005-03-03)<br>-----                         | 1                                |                                                         |
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| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -----<br>US 2 857 201 A (PALMER JOHN E)<br>21 October 1958 (1958-10-21)<br>* figures 1,2,5 *<br>-----             | 1                                |                                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                   |                                  | TECHNICAL FIELDS<br>SEARCHED (IPC)<br><br>B05B<br>B08B  |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                   | Date of completion of the search | Examiner                                                |
| The Hague                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                   | 27 November 2007                 | Roldán Abalos, Jaime                                    |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                                                                                                   |                                  |                                                         |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 07 42 5396

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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27-11-2007

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**REFERENCES CITED IN THE DESCRIPTION**

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