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(54) Method and device for fluidal drawing in free textile fibre ends.

(57) The purpose of the arrangement consists in simplification of handling upon drawing-in the free end of textile fibres through a hollow guide (2) on the textile machine and in simultaneous speeding-up of that operation. This is achieved by acting upon the textile fibre (1) by a pressure fluid flow transversally thereover, directed from outside into the hollow (6) of the guide (2). For making this possible, the device is provided at the point of outlet hole (5) with a transversally adjustable means (4) for the textile fibre (1).

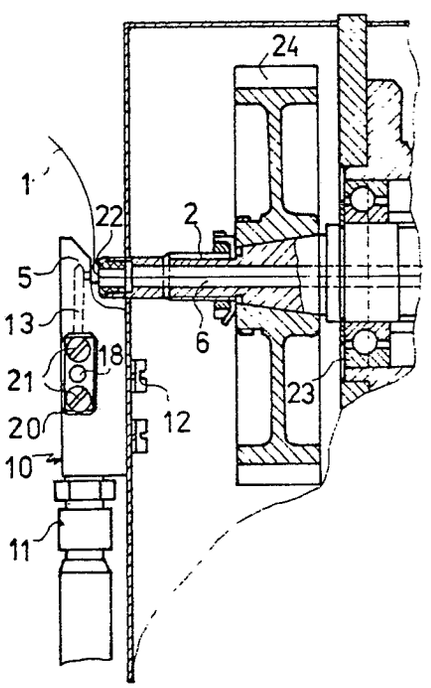

FIG. 7

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Method and device for fluidal drawing in free textile fibre ends

The present invention relates to a method and a device for the fluidal drawing-in of free textile fibre ends through their hollow guides in textile machines.

In textile machines, several methods of drawing-in free textile fibre ends through hollow guides are known. In winding, warping and similar textile machines, in which no pressure fluid is used for their operation, mechanical methods of drawing-in free yarn ends through the hollows of their guides are used. With short and direct guides the drawing-in is performed by sticking the textile fibre end into the hollow of the guide, and the trailing is performed without any aids. With longer and indirect guides, this is feasible. Therefore, various aids, such as e.g. a sufficiently long synthetic fibre, which, due to its elastic properties, can be passed through, the whole section of the guide hollow, including the indirect section. To the end of this elastic drawing-in means, the textile fibre end is fastened. By withdrawing the elastic drawing-in means through the exit opening of the guide hollow, the fastened textile fibre is drawn in and thereafter, through the whole hollow of the guide. Now, the textile fibre is separated from the elastic drawing-in-means, which is stored for its further application. This mechanical method is used also with weaving machines with mechanical weft inserters. These gripper and needle weaving machines have built in withdrawing means with relatively long and indirect guides, for the purpose of uniform withdrawal of textile fibres. In textile machines in which pressure fluid is used for their operation, such as e.g. pneumatic weaving machines, pneumatical methods are used for drawing in textile fibres through the guide hollows. The textile fibre is partially inserted into the guide hollow by its end, which is then axially acted upon by the pressure fluid passing through the hollow, thus performing the drawing-in of the textile fibre through the guide hollow. By performing this method, handling problems are encountered again, and the axial action of the pressure fluid upon the textile fibre is not too effective. The device is made in such manner that the pressure fluid is fed from a hand-operated valve which is connected to the pressure fluid source by means of a hose. An embodiment used more frequently has a drawing-in nozzle mounted at the point of the inlet hollow of the guide, which can be adjustable in axial direction. The nozzle with the pressure fluid supply forms part of the weaving machine device. Here again, the textile fibre is inserted into the hollow needle of the nozzle, on which the passage opening is very small. The pressure fluid is fed behind the exit and is discharged through the nozzle forms in the passage opening of the hollow needle underpressure by which the end of the textile fibre is drawn into the nozzle. Further, the pressure fluid, acting axially upon the end of the textile fibre, performs the drawing-in of the fibre through the guide hollow. This method is used in pneumatic weaving machines particularly for drawing in the textile fibre through the hollow shaft of the measuring device, in which the hollow shaft forms, together with an arm, a textile yarn guide, of which the hollow is relatively long and indirect.

The disadvantages mentioned above are mitigated to a considerable extent by the method according to the present invention, of which the subject matter consists in that the textile fibre is acted upon by a pressure fluid flow which is guided thereover transversally and directed into the guide hollow from outside.

The subject matter of the device according to the present invention consists in that at the point of the exit opening, said device is provided with an adjusting means for transversally adjusting the textile fibre exactly between the outlet opening of the pressure fluid hole and the inlet opening of the hollow of the guide means.

The advantage of the method and the device according to the present invention consists in effective and high speed drawing-in of the textile fibre and in very simple handling therewith. The device is mounted externally of the guide and is undemanding both in its design and its manufacture. This results in a shorter textile fibre handling time, and hence also a shorter fall-out of the textile machine operation.

An exemplary embodiment of the device for performing the method according to the present invention is shown in the accompanying drawings, of which Figs. 1 to 4 demonstrate diagrammatically the phases of the method of drawing-in the textile fibre through the guide hollow in the measuring device. In Figs. 5 and 6, an exemplary embodiment of the device for performing the method according to the present invention is shown in side view and in front view with partial section and in Fig. 7, its incorporation into the assembly of the measuring device of the nozzle weaving machine.

Upon drawing-in a textile fibre 1 into a hollow shaft and a winding arm, which forms a measuring device of a not represented nozzle weaving machine, a hollow guide pipe 2, the necessary length of the textile fibre 1 is withdrawn from a supply bobbin 3. The textile fibre 1 is drawn across a transversally adjusting means 4 of the device. The

transversally adjusting means 4 is formed in the shown embodiment as a transversal surface is transversally located between the outlet opening of pressure fluid hole 5 and a hollow 6 of the guide pipe 2 of the textile fibre 1 in active zone of expanding the pressure fluid. Said adjusting means 4 is formed like a stationary part of the body 10 of the device and serves to adjust transversally that means to fix the position of the textile fibre 1 being pulled over between the outlet opening 5 and the hollow 6 of the guide 2 in active zone of the pressure fluid so that after supplying the pressure fluid through the inlet 11 into the body 10 said pressure fluid flowing out from the opening 5 blows the textile fibre 1 reliably in the form of a loop 7 into the hollow 6 of the guide 2.

A pressure fluid begins to flow from an outlet hole 5 into the hollow 6 of the guide pipe 2 and begins to entrain the textile fibre 1, which is positioned transversally thereto, at the point of its measured length. The textile fibre 1 begins to form a loop 7, and the pressure fluid acts thereupon most effectively at its transversal face 8. With the forming loop 7 of textile fibre 1 advancing through the hollow 6 of guide 2, its free end is also drawn in until said end leaves the hollow 6 at a point of the depositing surface of a drum 9 of the measuring device.

As shown in Fig. 5 to 7 a body 10 of the device having a pressure fluid supply 11 is fixed to the stationary part of the measuring device by a pair of screws 12. The supply 11 in the lower part of body 10 is continued by a boring 13, which is deposited at the half of its length on a smaller diameter. At the point of the recess, a saddle 14 is formed for a spring loaded ball 16 for sealing contact therewith by intermediary of a pressure spring 15. Above the recess point, opens into the boring 13 a guideway 17 of a pressbutton 18 perpendicularly thereto is disposed, said pressbutton being provided with a reverse spring 19. Against falling-out the pressbutton 18 is covered from outside by a cover 20 fixed on the body 10 by lock screws 21. In the upper part of the boring 13 the outlet hole 5 is transversally connected therewith and its orifice is situated in front of the hollow 6 of guide 2. Between the orifice of the outlet hole 5 and the hollow 6 of the guide 2, the transversally adjusting means 4 for the textile fibre 1 is formed on the body 10 of the device in the form of a transversal surface. The inlet part 22 of the guide pipe 2 is made of anti-abrasive material. As shown in Fig. 7, the guide 2 and a winding arm (not represented) is mounted in the body of the measuring device rotatably in bearings 23 and coupled in its drive via pulley 24 with the not represented drive of the machine.

Upon repeated introduction of textile fibre 1 into the measuring device, textile fibre 1 is leaded over the surface 4 forming the transversally adjusting means. By displacement of the pressbutton 18, upon simultaneous overcoming of the resistance of its reverse spring 19 the ball 16 is pressed below the saddle 14 and the pressure fluid entering the body 10 of the device through the supply 11. The pressure fluid flow, which comes out through outlet hole 5 and which is directed into hollow 6 of guide 2, starts acting upon textile fibre 1, which is deposited transversally thereto on the surface of the transversally adjusting means 4. At the point of the pressure fluid action, a loop 7 is formed on the textile fibre 1, and the drawing-in of the end of textile fibre 1 is performed in accordance with the method already specified above.

The size of the outlet hole 5 and the diameter of the hollow 6 in the inlet part of guide 2 are decisive for determining the gap therebetween as, for the correct drawing-in of the free end of the textile fibre 1, the whole carrier current of the pressure fluid must enter the hollow 6. As the pressure fluid flow discharged through the outlet hole 5 expands under an angle of approximately 11°, the gap must be only of such size that the cross section of the pressure fluid in the inlet part 22 is at maximum of the same size as the cross section of the hollow 6 of the guide 2.

The transversally adjusting means 4 also need not be formed by only one surface, but can be shaped as a groove, an edge or another geometrical formation, which makes possible a transversal adjustment of textile fibre 1 relative to the pressure fluid flow.

The device according to the present invention can be either stationary, as specified in the exemplary embodiment, fixed to a stationary part of the textile machine, manually portable, where the outlet hole 5 with the transversally adjustable element 4 for textile fibre 1 is formed in the orifice of a manual pistol, in which the pressure fluid source is formed by a pressure gas cylinder. Between the pressure fluid source and the orifice of the manual pistol, an interrupting dosing valve is interposed.

Claims

1. Method of fluidal drawing-in of free textile fibre ends through a hollow guide in textile machines,
characterized in that
the textile fibre is acted upon by a pressure fluid flow guided thereover transversally and directed into the guide hollow from outside.

2. Method as claimed in claim 1, characterized in that the textile fibre is acted upon from the point of its in advance measured length.

3. Device for performing the method according to claims 1 or 2 in a textile machine with at least one textile fibre guide (2), comprising a pressure fluid supply with a valve and an outlet hole, characterized in that at the point of outlet hole (5) the device is provided with a transversally adjusting means (4) for leading the textile fibre (1) in the fibre guide means (2).

4. Device according to claim 3, characterized in that it is fixed on a stationary part of the textile machine with the outlet hole (5) of the device arranged in front of hollow (6) of guide means (2).

5. Device according to claim 3 or 4, characterized in that the adjusting means (4) is a geometrically shaped surface disposed on a stationary part (10) transversally to the axis of the outlet hole (5) and of the guide means (2) for leading and adjusting the textile fibre (1) exactly between the openings of the hole (5) and of the guide (2).

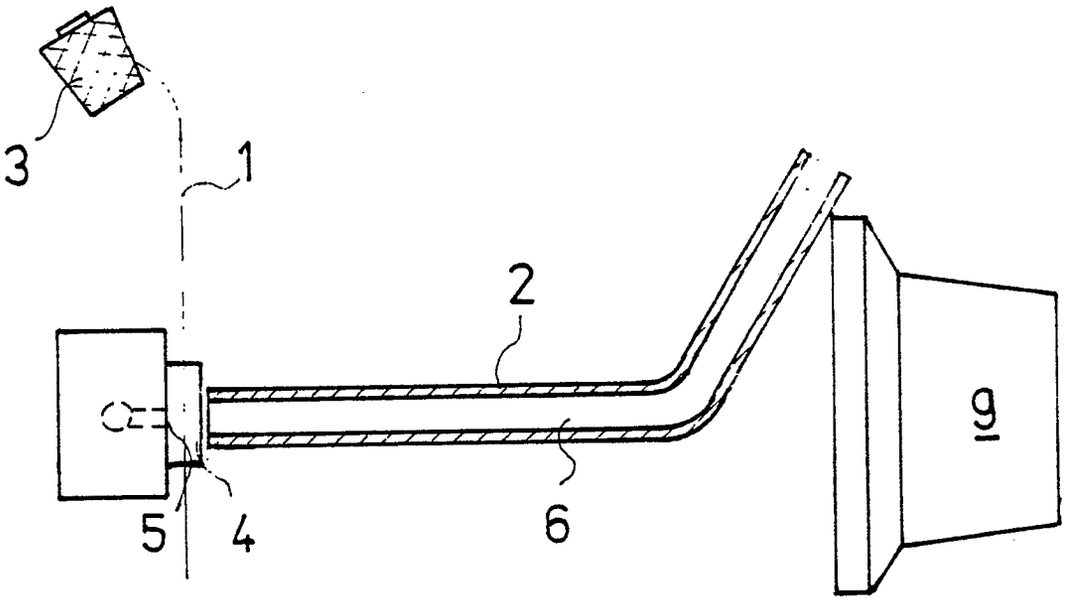

FIG. 1

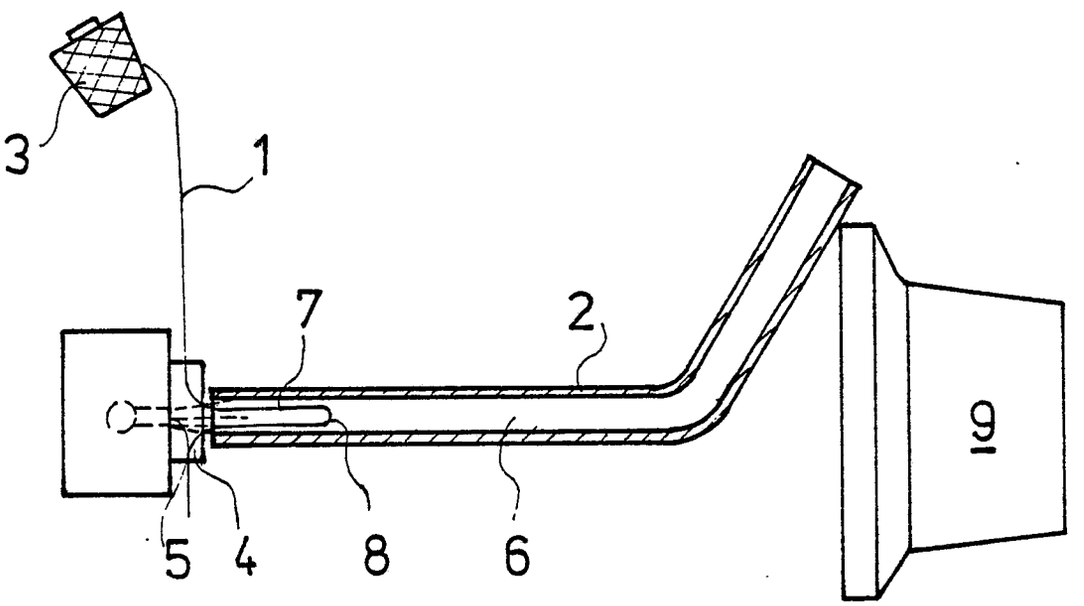

FIG. 2

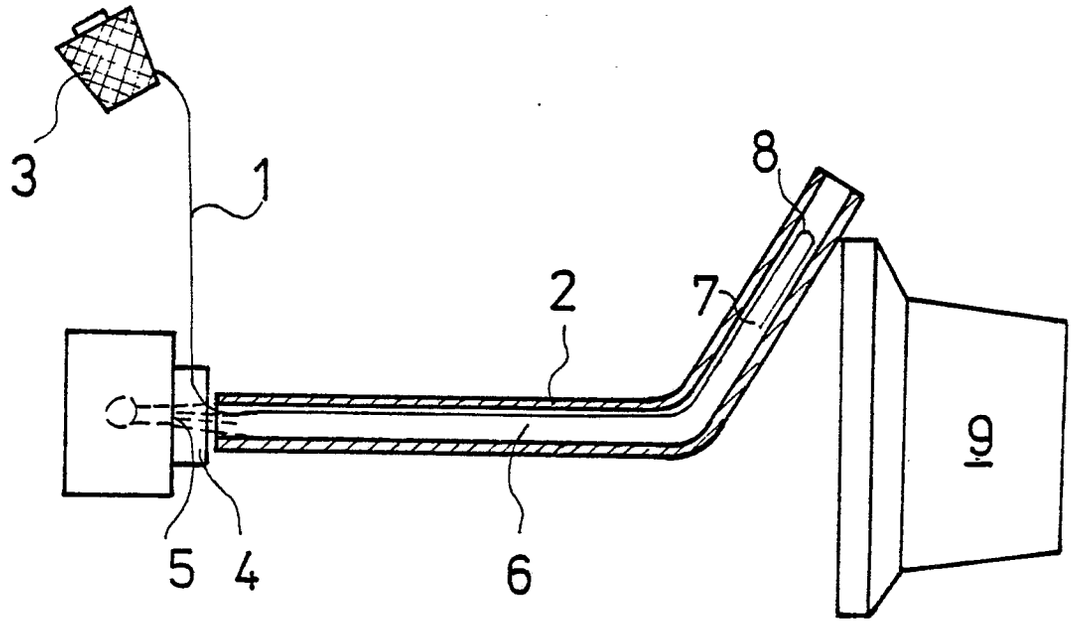

FIG. 3

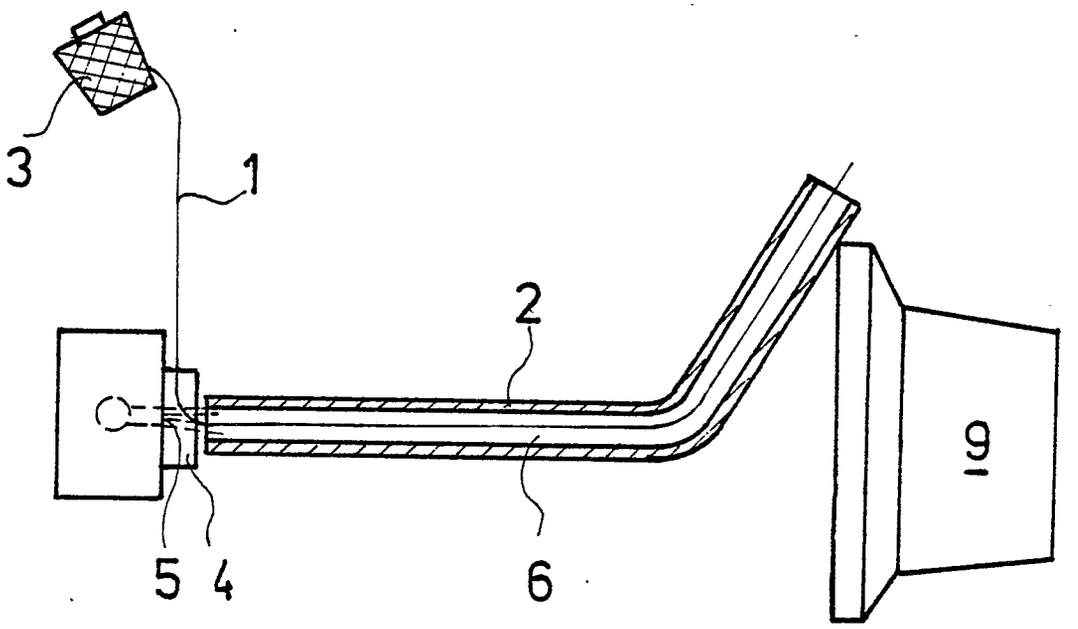

FIG. 4

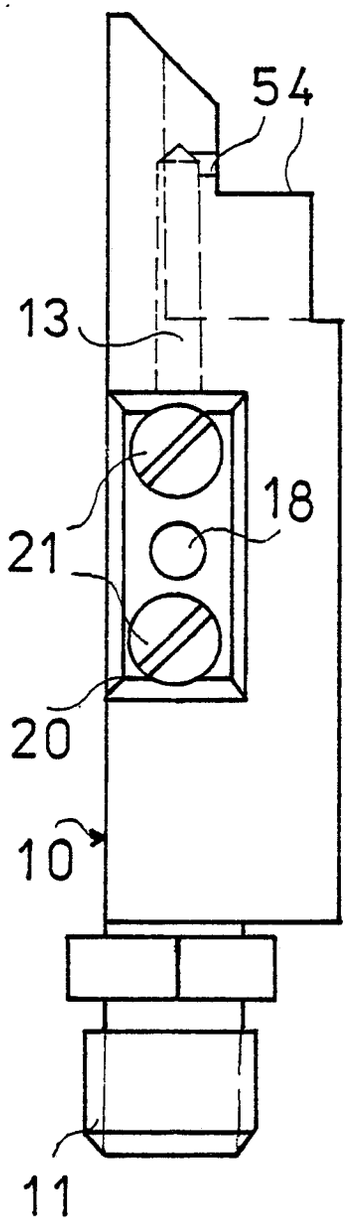

FIG. 5

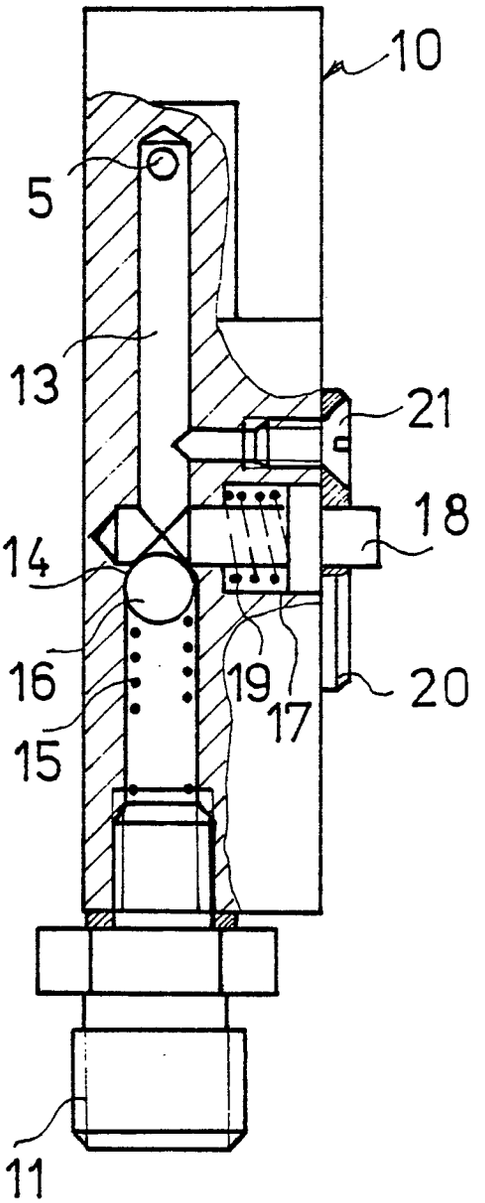

FIG. 6

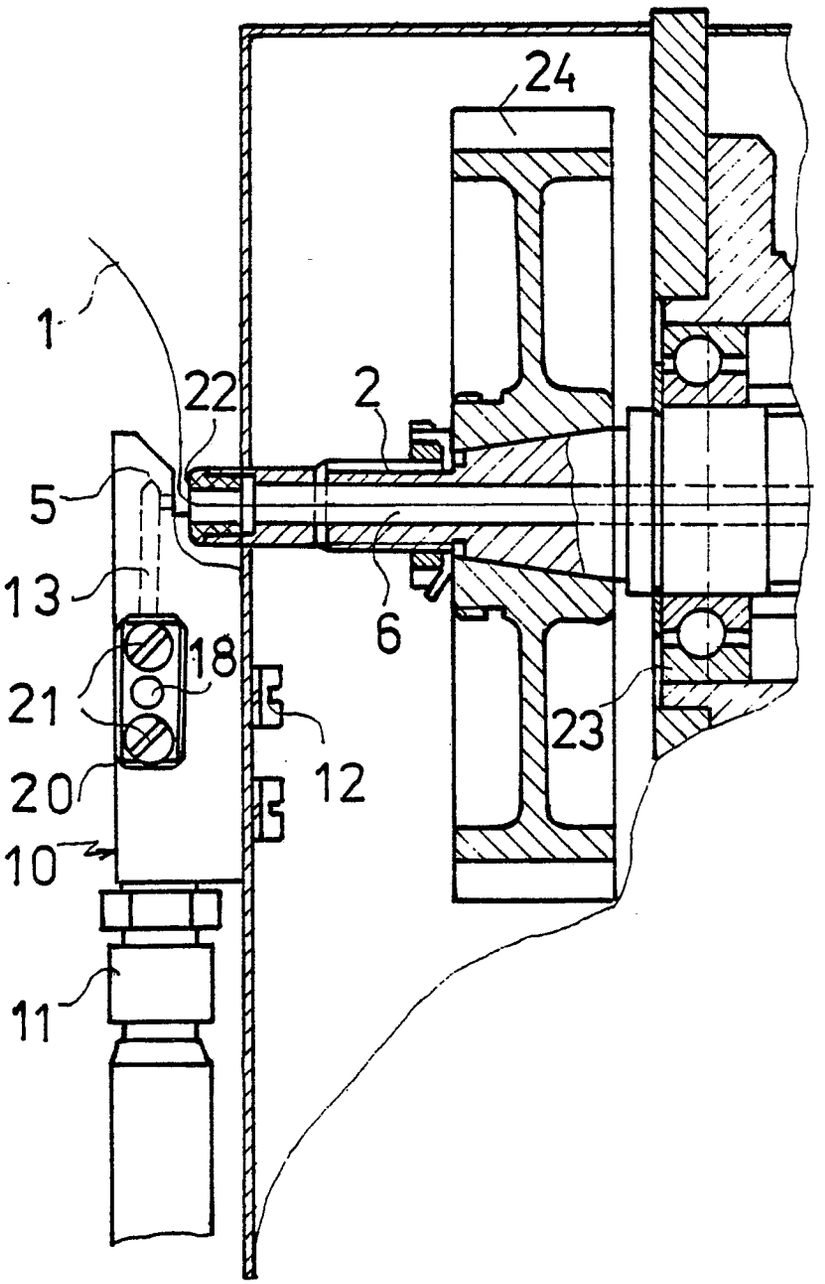

FIG. 7