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(54) Support assembly for printing plateholder cylinders, particularly in flexographic printing machines

(57) A support assembly for printing plate-holder cylinders, particularly in flexographic printing machines, including a first (1) and a second (2) shoulders that form seats (4,5) for rotatably supporting the ends of a printing plate-holder cylinder (3), at least one of the seats (4) being formed by an upper bracket (10) connected to a lower bracket (13), the upper bracket (10) being overturnable about a first axis (11) that is substantially parallel to the axis of the seat and the lower bracket (13) being arranged at the end of an arm (12) that can be turned over about a second axis (20) that is substantially perpendicular to the first axis (11).

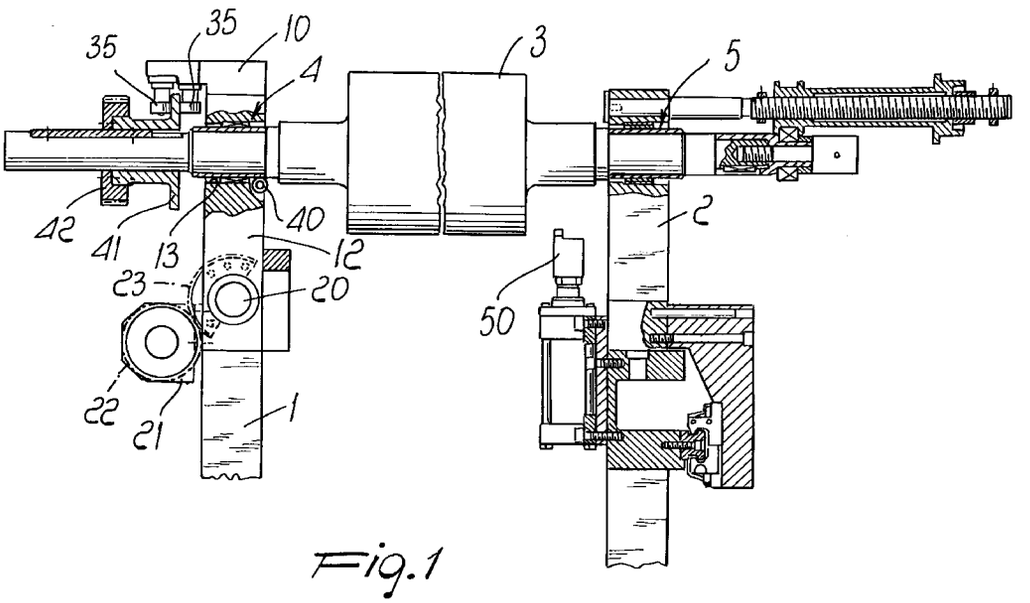

Fig.1

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Description

The present invention relates to a support assembly for printing plate-holder cylinders, particularly in flexographic printing machines.

It is known that in flexographic printing machines it is necessary to replace the printing plates on the cylinders according to the different printing requirements.

In order to replace the printing plate, some solutions entail fully removing the cylinder from the printing machine, with the obvious related drawbacks, in view of the fact that handling is extremely complicated and long, due to the considerable weight of the cylinders, with consequent long machine downtimes.

In order to avoid these drawbacks, solutions are already commercially available that entail performing the axial extraction, with respect to the cylinder, of one of the seats that support the end of the cylinder, while said end is supported by a piston which is in practice arranged laterally adjacent to the shoulder that forms the seat that is extracted.

Once axial extraction of the seat has been performed, the portion of shoulder that forms the seat is turned over and the supporting piston is removed, while the cylinder is supported in a cantilevered manner by the other shoulder and the printing plate is replaced.

The end of the cylinder is then again supported by means of the piston, so as to reposition it with respect to the seat, which is again moved axially so as to again couple to the end.

This solution is considerably complicated; furthermore, considerable difficulties arise in performing correct mutual positioning between the seat and the end of the cylinder when the seat and the cylinder are recoupled, so that printing plate replacement times are considerably long.

A principal aim of the invention is to solve the above-mentioned problems by providing a support assembly for printing plate-holder cylinders particularly for flexographic printing machines, which allows to replace on board the machine, at the same time eliminating all the difficulties in coupling between the seat and the end of the cylinder.

Within the scope of the above aim, a particular object of the invention is to provide a support assembly in which uncoupling between the end of the cylinder and the seat does not produce dangerous sliding and slipping movements between the seat and the end of the cylinder and furthermore allows to significantly reduce intervention times.

Another object of the present invention is to provide a support assembly for printing plate-holder cylinders particularly in flexographic printing machines which, by virtue of its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

Another object of the present invention is to provide a support assembly for printing plate-holder cylinders that can be easily obtained starting from commonly commercially available elements and materials and is furthermore competitive from a merely economical point of view.

This aim, these objects, and others which will become apparent hereinafter are achieved by a support assembly for printing plate-holder cylinders, particularly in flexographic printing machines, which comprises a first and a second shoulders that form seats for rotatably supporting the ends of a printing plate-holder cylinder, characterized in that at least one of said seats is formed by an upper bracket connected to a lower bracket, said upper bracket being overturnable about a first axis that is substantially parallel to the axis of said seat and said lower bracket being arranged at the end of an arm that can be turned over about a second axis that is substantially perpendicular to said first axis.

Further characteristics and advantages will become apparent from the following detailed description of a preferred but not exclusive embodiment of a support assembly for printing plate-holder cylinders, particularly in flexographic printing machines, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic view of the support assembly according to the invention;
figure 2 is a partially sectional front view of the seat constituted by a lower and an upper brackets;
figure 3 is an axial view of the seat of figure 2, with the opening of the upper bracket shown in dashed lines;
figure 4 is a top plan view of the shoulder, with the lower bracket turned over to allow printing plate replacement;
figure 5 is a schematic view of the stroke limiters for the rotation of the arm that forms the lower bracket.

With reference to the above figures, the support assembly for printing plate-holder cylinders, particularly in flexographic printing machines, comprises a first shoulder 1 and a second shoulder 2 that are spaced from one another and support the ends of a printing plate-holder cylinder, generally designated by the reference numeral 3.

In greater detail, the first shoulder 1 forms an openable seat 4 and the second shoulder 2 forms a fixed seat 5 in which the axial ends of the printing plate-holder cylinder 3 rotatably engage.

The particularity of the invention resides in the fact that the first seat 4 is formed by an upper bracket 10 that can be turned over about a first axis 11 which is substantially parallel to the axis of the seat and is parallel to the axis of the printing plate-holder cylinder in the assembled condition.

The upper bracket 10 is pivoted, about the axis 11, to the end of an arm 12 which forms a lower bracket 13 coupleable to the bracket 10 to form the seat 4.

The arm 12 can be turned over about a second axis 20 that is substantially perpendicular to the axis 11.

The arm 12 is turned over by means of a hydraulic rotating overturning actuator 21, which actuates a first driving gear 22 that meshes with a toothed sector 23 keyed on the shaft 20.

As shown in figure 5, adjustable stroke limiters 30 and 31 are also provided which allow to adjust the exact stroke-limit position.

Furthermore, at the axial end of the seat 4, on the side directed towards the cylinder 1, there is provided a rolling bearing 40 the axis whereof is perpendicular to the axis of the cylinder, said bearing facilitating relative sliding during overturning.

Furthermore, guiding rollers 35 are connected to the upper bracket 10 and keep the wing 41 associated with a gear 42, which transmits the rotary motion to the cylinder 3 and is extracted after turning the upper bracket over.

At the other end of the cylinder there is provided a supporting piston 50 that engages the axial end of the printing plate-holder cylinder 3 during the overturning of the arm 12, so as to allow optimum support while the printing plate-holder cylinder 3 is held in a cantilevered manner.

In practical operation, when the printing plate must be replaced, the upper bracket 10 is turned over, in practice opening the seat 4, and then, after extracting the driving gear 42, the arm 12 is turned over so that the printing plate-holder cylinder, supported in a cantilevered manner by the other seat 5 and by the supporting piston 50, allows to extract the printing plate and replace it.

Then the above operations are repeated in reverse, turning the arm 12 over again so as to align it with the shoulder 1 and the upper bracket is closed, thus forming the seat 4 again.

From the above description it is thus evident that the invention achieves the intended aim and objects, and in particular the fact is stressed that the provision of an openable seat considerably facilitates all the operations for coupling the end of the shaft and the seat, without having to resort to troublesome mutual positionings of the end and the seat and without causing damage to the supporting bearings.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the contingent shapes and dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A support assembly for printing plate-holder cylinders, particularly in flexographic printing machines, which comprises a first and a second shoulders that form seats for rotatably supporting the ends of a printing plate-holder cylinder, characterized in that at least one of said seats is formed by an upper bracket connected to a lower bracket, said upper bracket being overturnable about a first axis that is substantially parallel to the axis of said seat and said lower bracket being arranged at the end of an arm that can be turned over about a second axis that is substantially perpendicular to said first axis.

2. The support assembly according to claim 1, characterized in that it comprises a hydraulic rotating overturning actuator that actuates a first driving gear that couples to a toothed sector which is keyed on the shaft that forms said second axis.

3. The support assembly according to the preceding claims, characterized in that it comprises adjustable stroke limiters that interact with said arm for positioning in the overturned position and in the operating position.

4. The support assembly according to one or more of the preceding claims, characterized in that it comprises, on said lower bracket, a rolling bearing that is substantially perpendicular to the axis of the cylinder to facilitate mutual sliding during overturning.

5. The support assembly according to one or more of the preceding claims, characterized in that it comprises guiding rollers that are associated with said upper bracket and engage a wing that is associated with a gear for transmitting the rotary motion to said printing plate-holder cylinder.

6. The support assembly according to one or more of the preceding claims, characterized in that it comprises, on the shoulder lying opposite to the shoulder that forms the openable seat, a supporting piston that can engage the axial end of the printing plate-holder cylinder during the overturning of said arm.

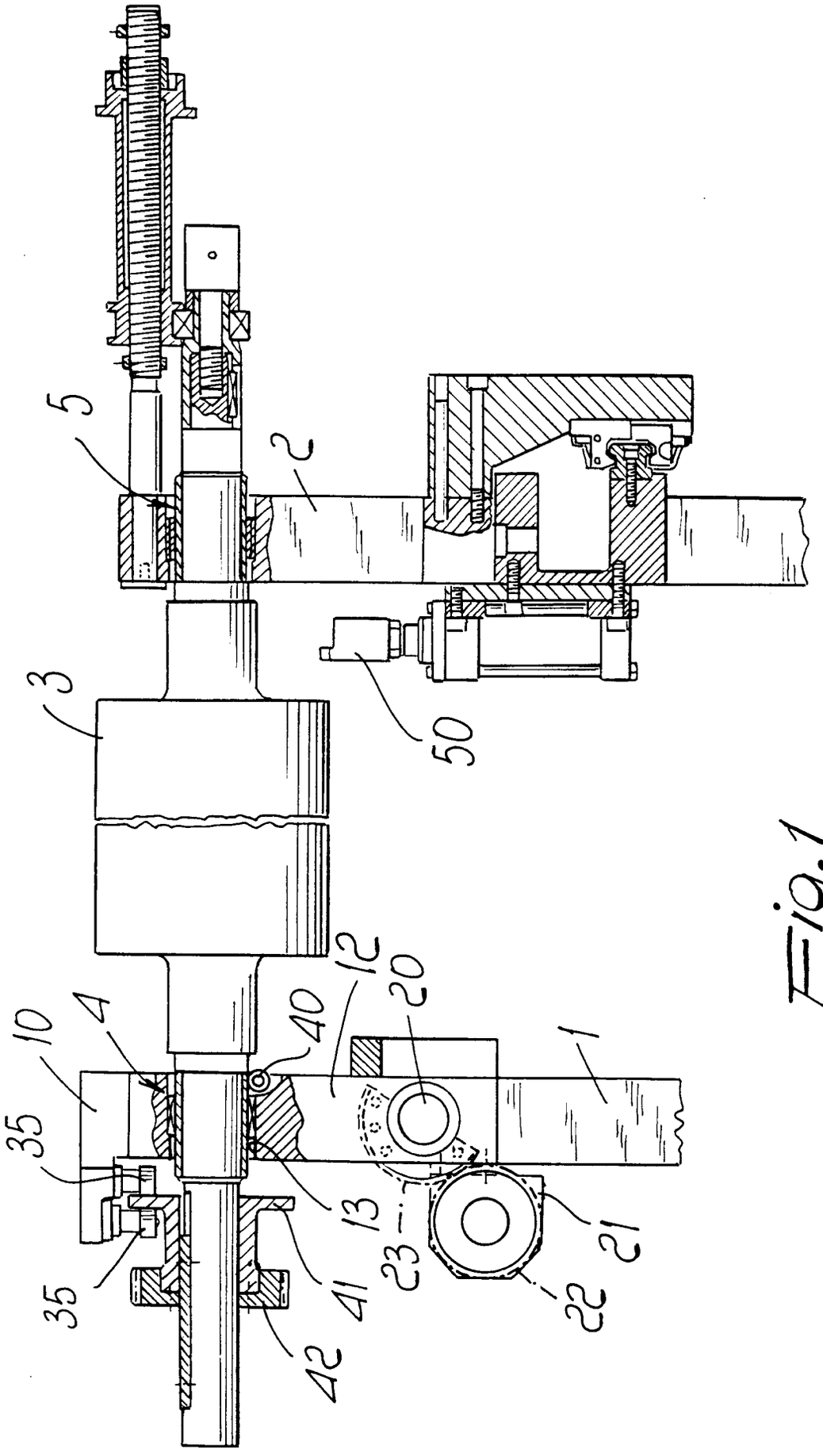

Fig. 1

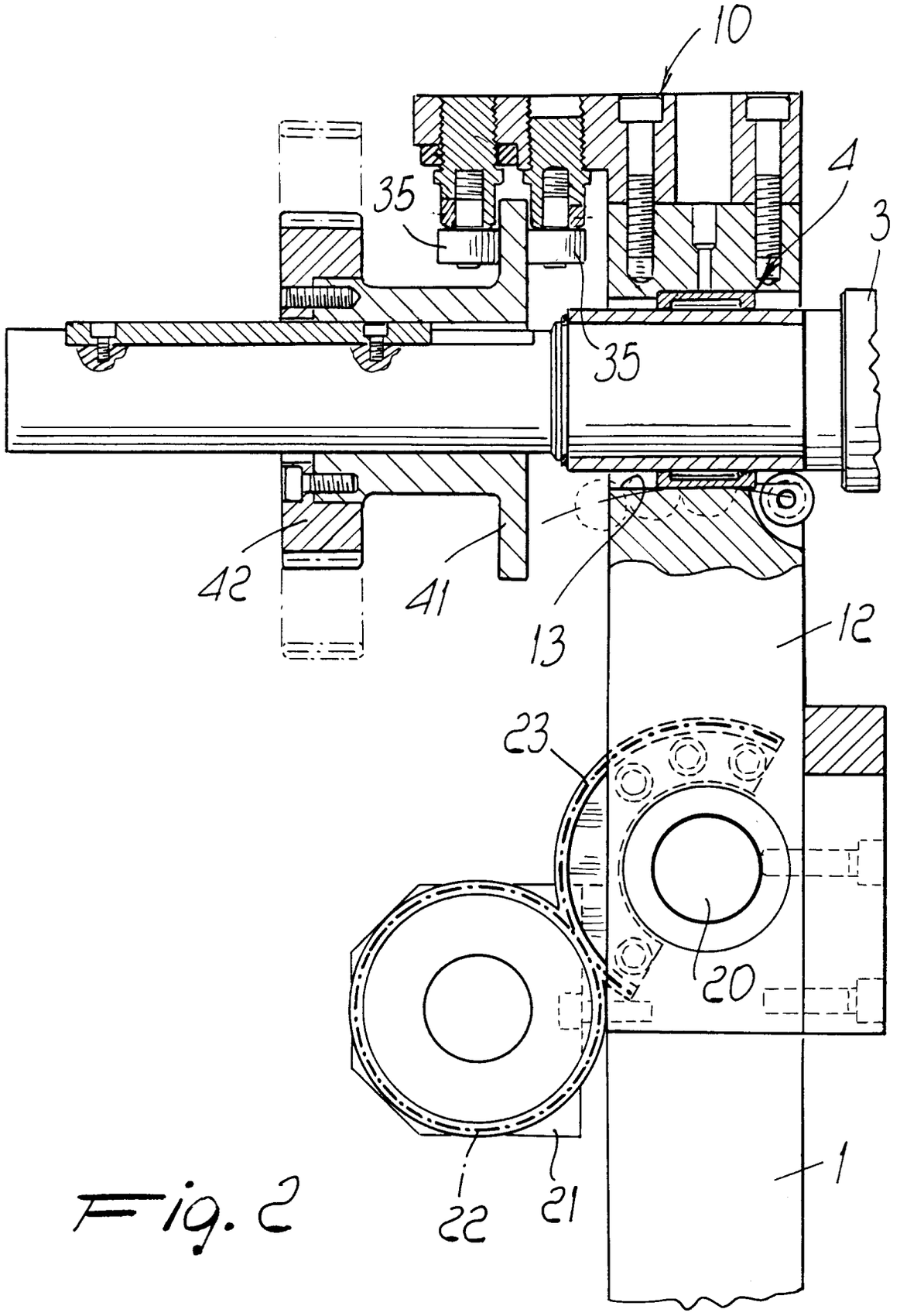

Fig. 2

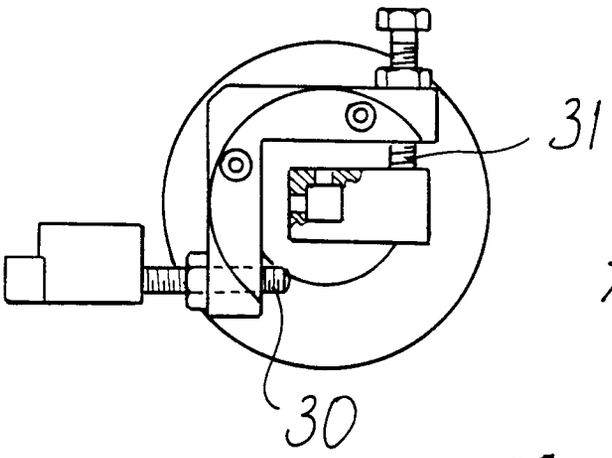

Fig. 5

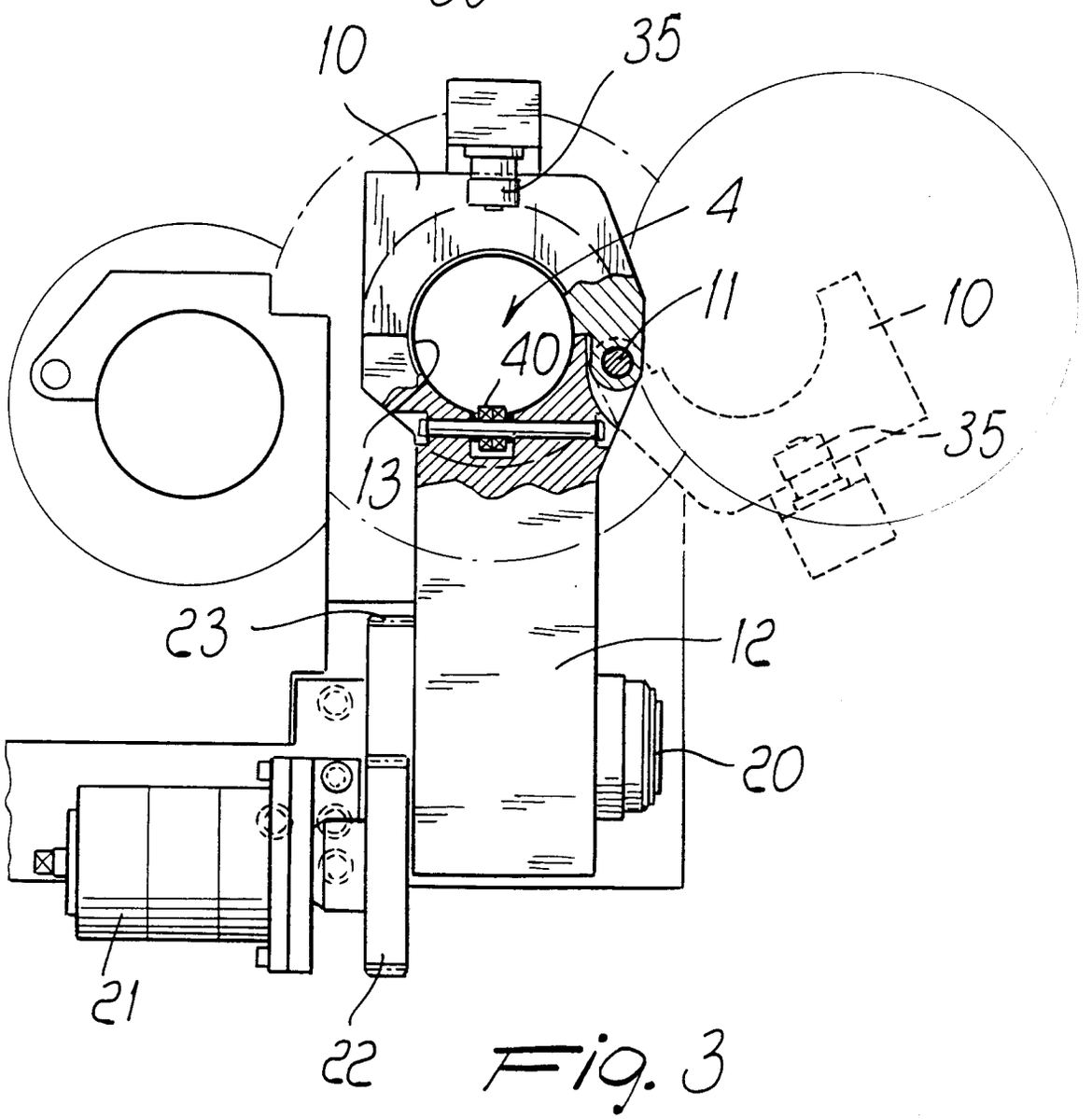

Fig. 3

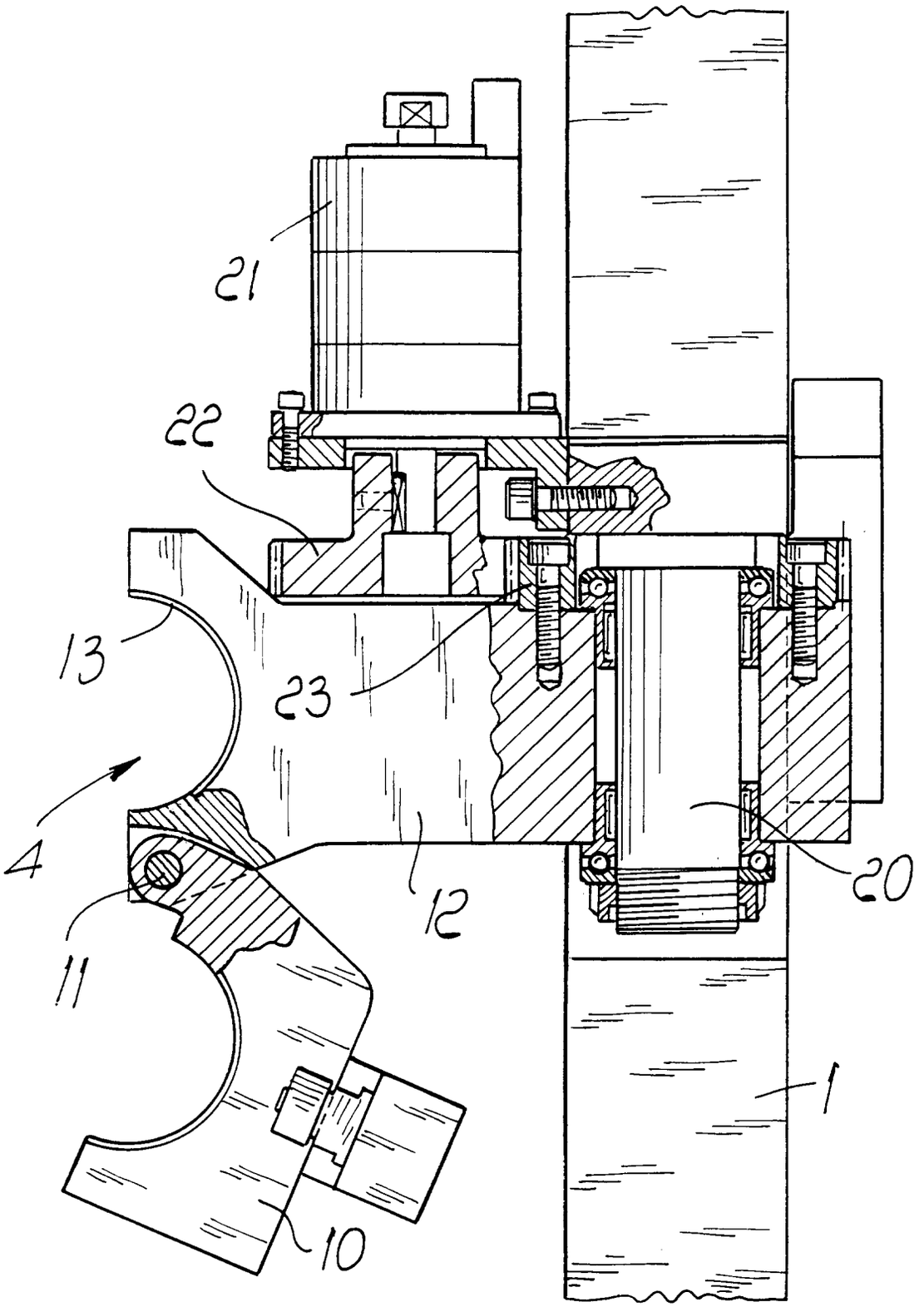

FIG. 4