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

(11) EP 1 099 994 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.05.2001 Bulletin 2001/20

(51) Int Cl.[7]: **G05G 5/05**

(21) Application number: **00203799.2**

(22) Date of filing: **01.11.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **10.11.1999 IT MI990677 U**

(71) Applicant: **OFFICINE BIEFFEBI S.r.l.**
Gonzaga (Mantova) (IT)

(72) Inventor: **Zaccarelli, Paolo**
Correggio (RE) (IT)

(74) Representative:
Raimondi, Alfredo, Dott. Ing. Prof.
Dott. Ing. Prof. Alfredo Raimondi S.r.l.
Piazzale Cadorna 15
20123 Milano (IT)

(54) Bidirectional device for recalling transmission elements such as rods, levers, connecting rods and the like

(57) Actuating device for recalling into a predefined position transmission elements (1,2) such as rods, connecting rods and the like, comprising a container element (10) which has, coaxially inserted inside it, a preassembled group (100) comprising at least one bar (110) provided with two annular projections (120) and at least one spring (130) arranged between said annular projections (120) and designed to be compressed by axial sliding of the bar (110) relative to the cylinder (10), means (13,150) for locking said group (100) in position relative to the container (10) being provided.

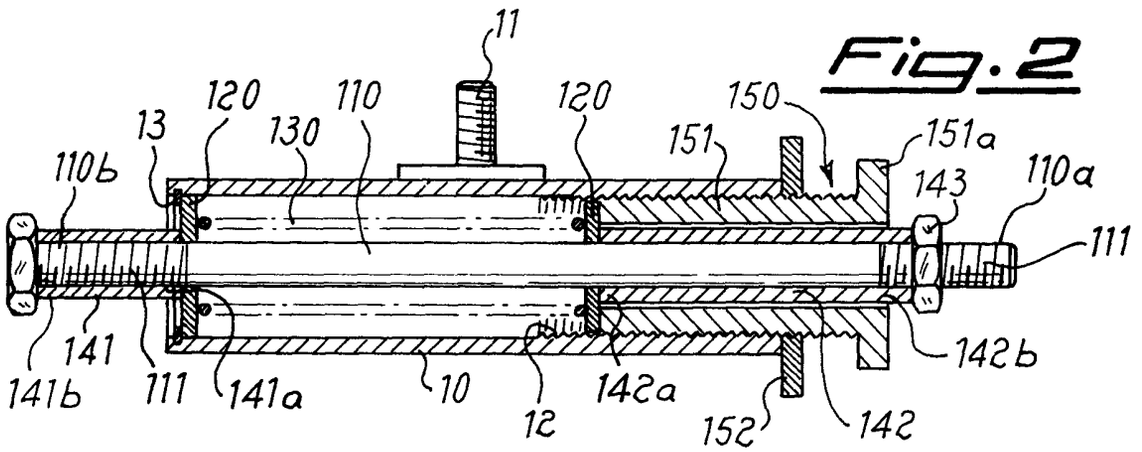

Fig. 2

EP 1 099 994 A2

Description

[0001] The present invention relates to a recall device for ensuring the return, into a predefined position, of transmission elements such as rods, connecting rods and the like, comprising a container element which has, coaxially inserted inside it, a preassembled group comprising at least one bar axially slidable with respect to the container and provided with two annular projections between which at least one spring is arranged, said spring being compressed by axial sliding of the bar relative to the container.

[0002] It is known in the technical sector relating to the actuation of movement transmission elements such as rods, levers, connecting rods and the like that there exists the need to ensure the return of said transmission elements into the rest position once the action by means of which they are displaced from said rest position has been performed.

[0003] It is also known that numerous devices have been constructed for this purpose, these devices, although performing their function, nevertheless having certain drawbacks arising from the dimensions, the need to supply fluids, or a reduced capacity to regulate the return speed.

[0004] The technical problem which is posed, therefore, is that of providing an actuating device for recalling into the rest position transmission elements such as rods, levers, connecting rods and the like, which is able to provide a solution for the abovementioned drawbacks.

[0005] Within the context of this problem a further requirement is that the device should be of the bidirectional type so as be efficient in both the actuating directions.

[0006] These technical problems are solved according to the present invention by a recall device for ensuring the return, into a predefined position, of transmission elements such as rods, connecting rods and the like, comprising a container element which has, coaxially inserted inside it, a preassembled group comprising at least one bar which is axially slidable with respect to the container and provided with two annular projections and at least one spring which is arranged between said annular projections and designed to be compressed by axial sliding of the bar relative to the container, means for positioning said group relative to the container being provided.

[0007] Further details may be obtained from the following description of a non-limiting example of embodiment of the invention provided with reference to the accompanying drawings in which:

- Figure 1 shows a partially exploded view of the device according to the invention;
- Figure 2 shows a cross-section along a longitudinal vertical plane of the device according to Fig. 1;
- Figure 3 shows the device during operation in a thrusting direction; and
- Figure 4 shows the device during operation in a thrusting direction opposite to that of Fig. 3.

[0008] As shown, the device according to the invention is substantially composed of a tubular container 10 which is open at its opposite ends and on the side surface of which a threaded element 11 is mounted. One end 10a of the two ends of the cylinder has a female thread 12, while a snap ring 13 (seeger) is attached to the opposite end 10b.

[0009] The cylinder has, coaxially inserted inside it, a preassembled group 100 which comprises:

- a rod 110, the opposite ends of 110a,110b of which have a threaded section 111; as will emerge below, the length of the bar 100 is such that, after assembly, the threaded ends project axially outside of the cylinder 10.

[0010] The following are coaxially mounted on said bar:

- two annular projections 120 arranged at a suitable relative distance in the axial direction so as to contain within them:
  - a spring 130 which is normally extended;
- two sleeves 141,142, of suitable length, arranged on opposite sides of the annular projections 120;
  - a first end 141a and 142a of said sleeves is arranged in contact with the associated annular projection 120, against which the sleeve is kept axially fixed by means of a respective locking nut 143 screwed onto the said thread 111 of the opposite ends 110a,110b of the bar 110 and acting on the opposite end 141b,142b of the respective sleeve;
- an adjusting element 150 consisting of a screw 151 with a hexagonal head 151a.

[0011] The screw is internally hollow so as to allow insertion thereof into the sleeve 142 of greater length and screwing onto the female thread 12 of the cylinder 10; said locking and adjusting element is completed by a ring 152 with a female thread 152a, the axial position of which along the screw 151 may be adjusted by means of rotation thereof in one direction or the other;

The operating principle of the device is as follows:

- the group 100 is assembled and inserted inside the cylinder 10 until an annular projection 120 comes into contact with the snap ring 13 (seeger),
- the screw 151 is screwed onto the female thread 12 of the cylinder 10; said operation essentially ensures adjustment of the pretensioning force of the

spring 130 and therefore its recall force, as will emerge more clearly below;

- the ring 152 is adjusted relative to the screw 151 until it comes into contact with the cylinder 10;
- the cylinder 10 is connected to a fixed constraint 3 by means of the threaded element 11;
- the two threaded ends 110a,110b of the bar 110 are connected to respective transmission elements schematically indicated by 1 and 2 in Figs 3,4.

[0012] In this way, the thrusting/pulling action of the elements 1,2 in one direction or the other (Fig. 3,4) causes compression of the spring against either one of the annular projections 120 fixed to the cylinder 10, so that, once the thrusting/pulling action of the element 1,2 has been completed, the spring itself tends to return into its rest position, bringing the two elements 1,2 with it.

[0013] It can therefore be understood how the device according to the invention is of the bidirectional type and allows the required recall action to be performed with great efficiency, reduced dimensions, the possibility of adjustment of the recall force and ease of assembly and installation even in restricted spaces, without requiring, on the other hand, substantial maintenance operations.

Claims

1. Recall device for ensuring the return, into a predefined position, of transmission elements (1,2) such as rods, connecting rods and the like, characterized in that it comprises a container element (10) which has, coaxially inserted inside it, a preassembled group (100) axially slidable with respect to the container (10) and comprising at least one bar (110) which is provided with two annular projections (120) and at least one spring (130) arranged between said annular projections (120) and designed to be compressed by axial sliding of the bar (110) relative to the container (10), means for relative coupling of said group (100) and the container (10) being provided.

2. Device according to Claim 1, characterized in that said container is a cylinder (10).

3. Device according to Claim 1, characterized in that said container (10) is provided with an element (11) integral with its external surface for locking the said container to a fixed constraint (3).

4. Device according to Claim 1, characterized in that said bar (110) has opposite ends (110a,110b) provided with a thread (111) designed to co-operate with a respective nut (143).

5. Device according to Claim 1, characterized in that said group (110) comprises two sleeves (141,142) of different length, coaxially mounted on the bar (110) and retained between a respective annular projection (120) and a nut (143).

6. Device according to Claim 1, characterized in that said means for relative coupling of the group (100) and the container (10) comprise elements (13,152) for locking said group (100) in position relative to the container (10).

7. Device according to Claim 1, characterized in that said elements for locking the group (100) in position comprise at least one snap ring (13) (seeger) arranged at one of the two opposite ends of the cylinder (10).

8. Device according to Claim 6, characterized in that said elements for locking the group (110) in position comprise a ring (152) with a female thread (152a) screwed onto a hollow screw (151) mounted slidably on the bar (110) and designed to the coupled with a corresponding female thread (12) on the end of the cylinder (10) opposite to that on which the said snap ring (13) (seeger) is arranged.

9. Device according to Claim 8, characterized in that said hollow screw (151) forms an element for adjusting the pretensioning force of the coaxial spring (130).

10. Device according to Claim 1, characterized in that it is bidirectional.

Fig.1

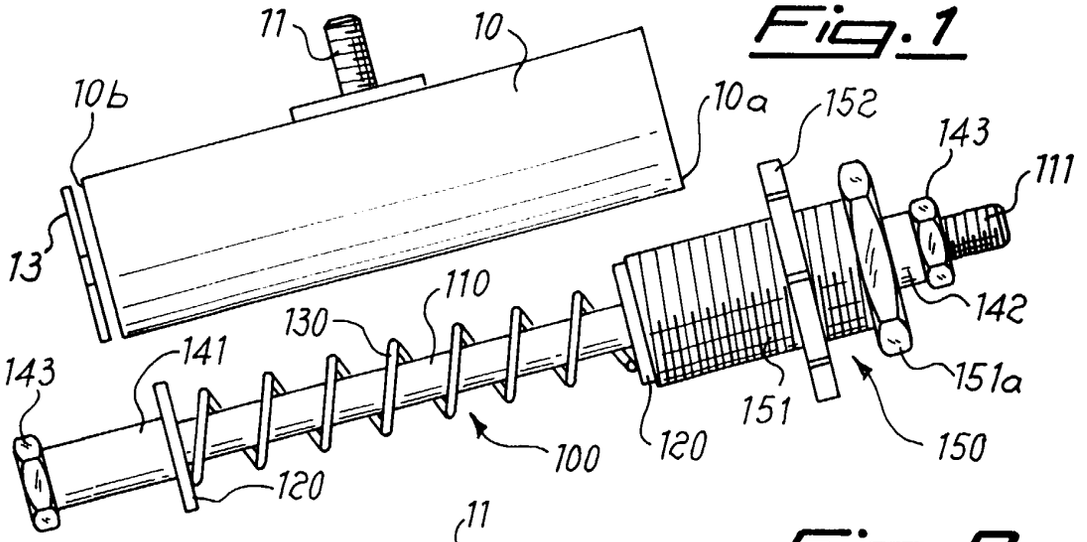

Fig.2

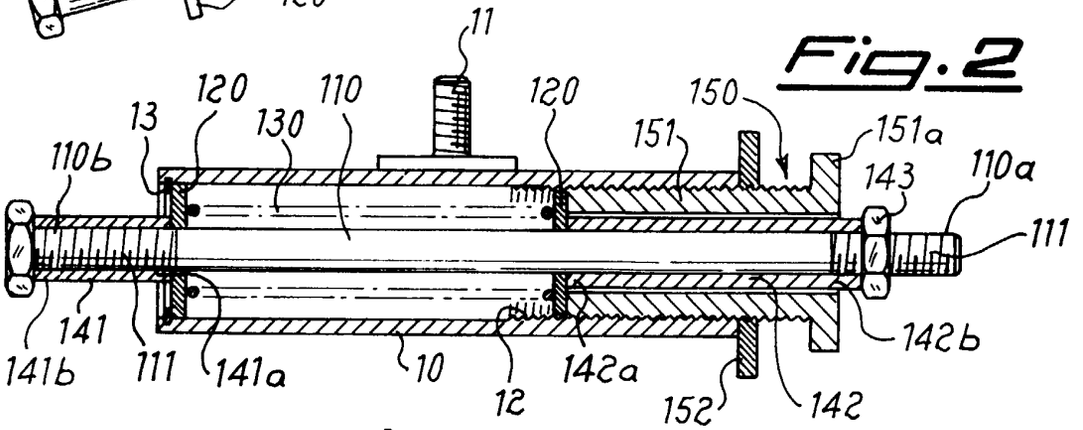

Fig.3

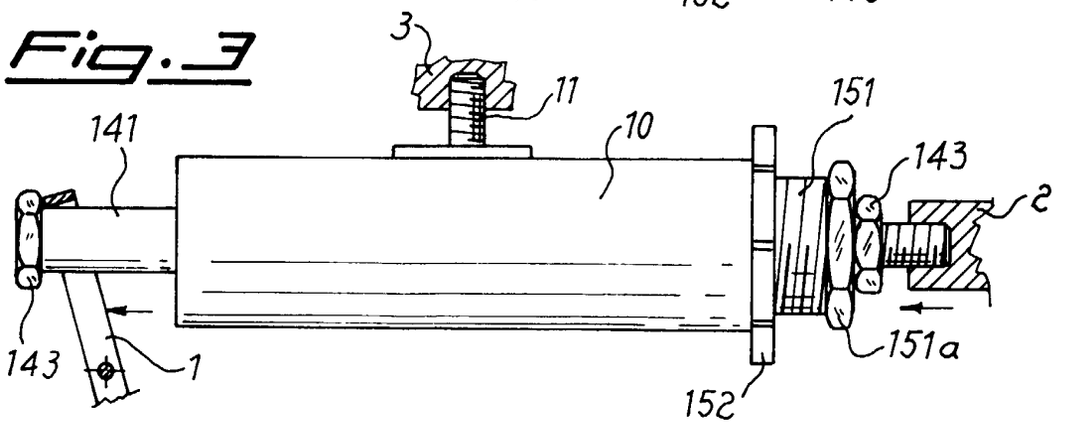

Fig.4