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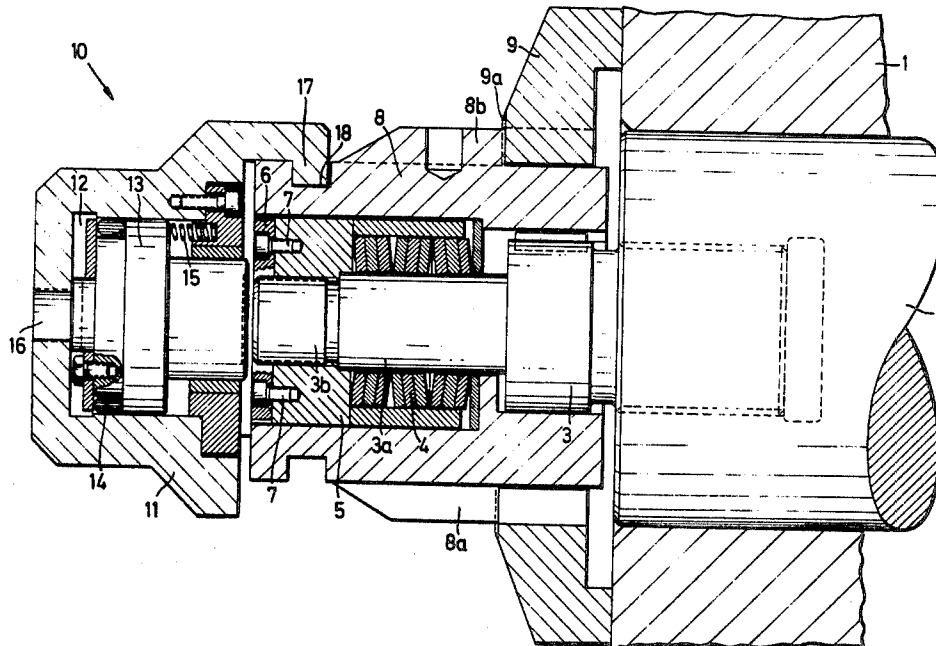
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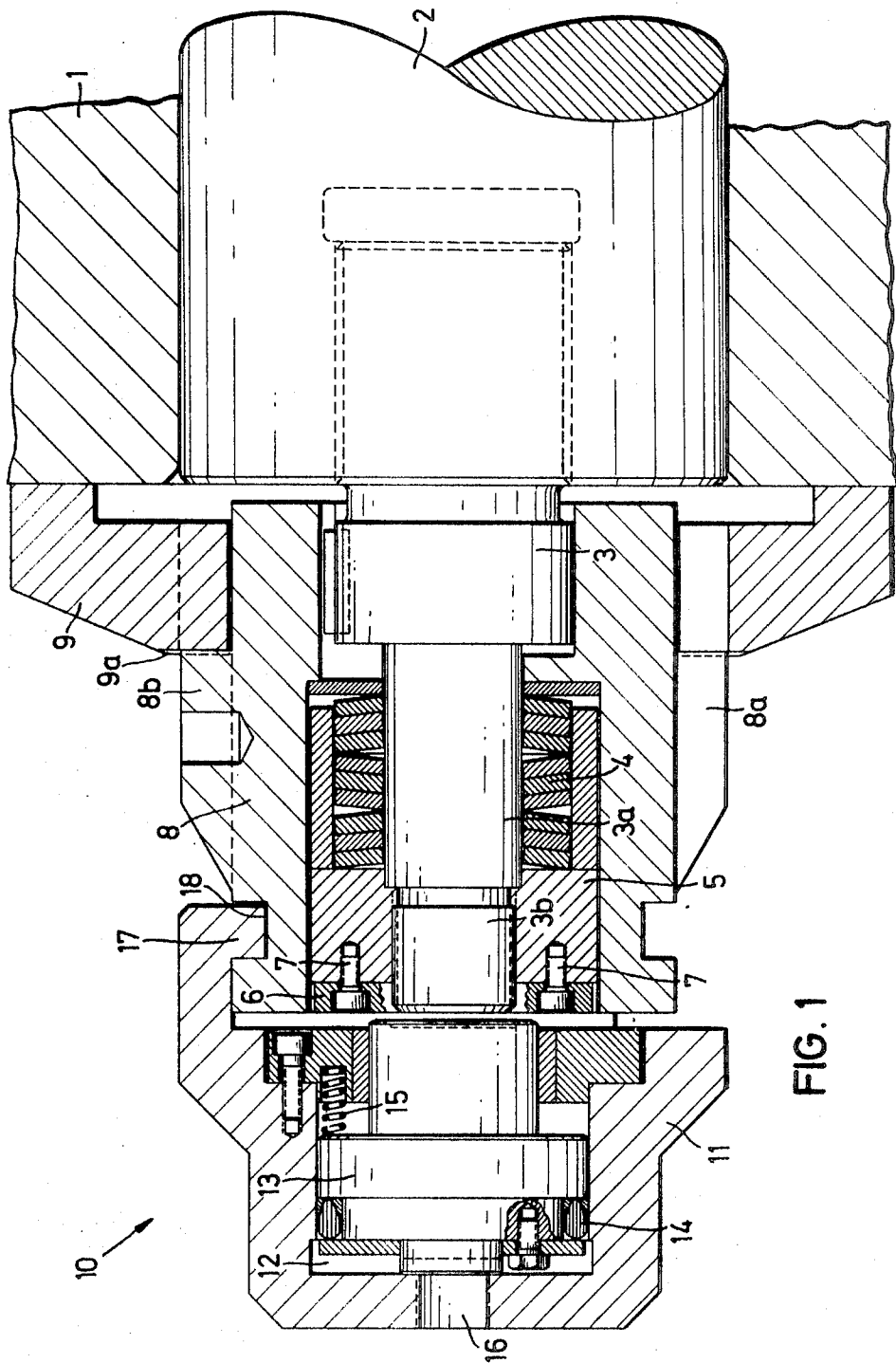
[54] **DEVICE FOR THE DETACHABLE FIXING OR**
LOCATION OF A PART ON A PIN OR SHAFT
10 Claims, 2 Drawing Figs.

[52] U.S. Cl..... **287/53,**
29/252

[51] Int. Cl..... **F16d 1/06**

ABSTRACT: This invention relates to a device for detachably fixing or locating a part on a pin or shaft by means of a locking ring engaging with the part to be fixed or located, the locking ring resting against a support displaceable in relation to the pin or shaft and acted upon by a spring, while the support can be moved by the action of a pressure medium against the force of the spring so as to enable the locking ring to be released and in which a special actuator is provided for moving the support against the spring force.





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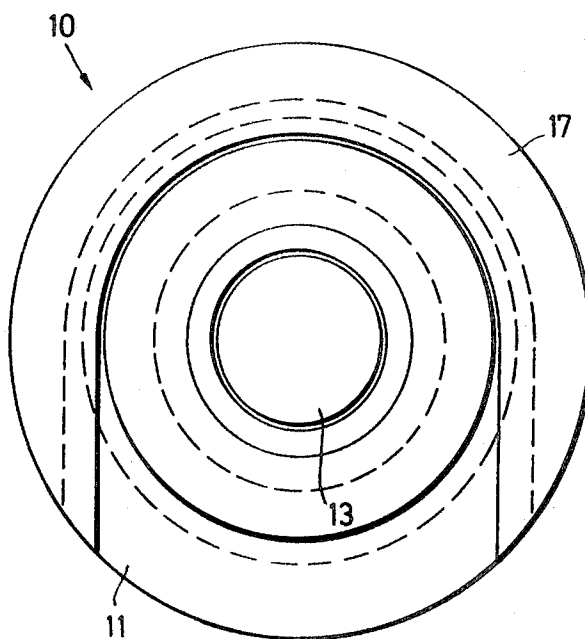


FIG. 2

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DEVICE FOR THE DETACHABLE FIXING OR LOCATION OF A PART ON A PIN OR SHAFT

The invention relates to a device for detachably fixing or locating a part on a pin or shaft, in particular a roller or the like on the straightening roller pin on a roller-type straightening machine with a locking ring engaging with the part to be located and resting on a spring support displaceable in relation to the pin or shaft, and moveable by pressure applied against the force of the spring in order to release the locking ring.

Means for the hydraulic release of this type of connection are known, these means being fixed to the shaft, where the support is in the form of a hydraulic jack guided on an annular piston. However, with a number of pins or shafts, for instance, in the case of the straightening roller pins of a roller-type straightening machine, each pin must be equipped with a hydraulic device of this type. This involves a considerable expense and constructional effort and has also the effect that seals or corresponding wearing parts are present on each pin or shaft and the operation of these parts has to be supervised and they may have to be replaced quite frequently.

It is an object of the present invention to overcome the existing disadvantages and inadequacies and to provide a device of the type mentioned above in which the locating or fixing and releasing of the part in question, in particular the straightening rollers of a roller-type straightening machine, can be carried out with minimal expense and in a convenient manner meeting effectively the requirements of practical work.

The invention provides for this purpose a special actuator for the motion of the support against the spring force. The actuator has two parts capable of being moved with respect to each other by the action of a pressure medium, one of the parts being capable of connection to the support while the other rests against a stop on the shaft or pin or a part connected to the shaft or pin.

This yields a considerable advantage in that it is no longer necessary for each pin or shaft to be equipped with hydraulic actuating elements, and that only the mechanical parts for applying the clamping or fixing force have to be provided. This represents a considerable simplification in construction, which in particular will also reduce costs. It also eliminates any danger that sensitive parts of hydraulic devices are contaminated or damaged in the operation of the machine in question. The special actuating unit provided, according to the invention, can be accommodated so as to be protected, when not in use, and is employed only on the part to be moved, when a part on the pin or shaft is to be detached or changed. Coupling up with the displaceable support can be carried out quickly and easily.

It is convenient to arrange the actuator so that its casing forms at the same time a cylinder for a piston displaceable in it.

For coupling up to the support, the actuator is advantageously equipped with at least one lug or the like capable of being fitted into an annular groove of the support. The lug could be particularly in the shape of a U or fork. It is also possible to arrange the actuator and support in such a way that the two parts engage with each other like a bayonet joint.

The lug or lugs of the actuator engaging with the support are made in one piece with the casing, in a very simple and convenient embodiment of the invention.

In principle it is also possible to connect the actuator to the support by means of screwable elements in particular by means of a shrouded nut or the like.

The invention is advantageously applied in all those cases where one part has to be fixed to a pin or shaft in such a way that it can be quickly changed. This is true in particular for the detachable fixing of rotating tools such as cutoff discs or other grinding wheels, circular saws and similar parts. The invention is especially advantageous in cases where several identical or similar parts have to be capable of being changed quickly, for instance, the rollers of a roller-type straightening machine.

The invention will now be described by way of example with reference to the accompanying drawing, in which:

FIG. 1 is a vertical longitudinal section through a device in accordance with the invention; and

FIG. 2 is a front view of the actuator unit.

The device illustrated here is used for detachably fixing or locating a straightening roller 1 on the straightening roller pin 2 of a roller-type straightening machine for rolled sections. A threaded bolt 3 is screwed into the roller pin 2. The bolt has a cylindrical part 3a accommodating a stack of Belleville washers 4. The latter rests with its left hand end in FIG. 1 on a nut 5 screwed on the male thread at the end 3b of the bolt and secured against rotation by an insert 6 secured with screws 7 across the end of the bolt 3. At its other end, the stack of Belleville washers 4 rest against a support sleeve 8 capable of displacement in the axial direction of the bolt 3 and roller pin 2, in relation to the latter.

The support 8 has on a part of its length slots 8a distributed over its circumference so that strip-shaped areas 8b projecting between the slots are formed. The external diameter of the latter is slightly less than the bore of the roller 1 so that the roller 1 can be pushed over the support 8 remaining in its position, on its seat on the straightening roller pin 2 and can also be pulled off it.

A locking ring 9 engages with the roller 1. The locking ring has an internal section corresponding to the outside section of the support 8. The ring can accordingly be pushed in the axial direction on the support 8 and when withdrawn it can be turned by an angle governed by the number of slots 8a and thus locked. In this locked position, the inward parts of the internal section of the locking ring 9 rest with their ends on the facing ends of the parts 8b. Radial slots 9a are provided for locking the appropriate parts of the face of the locking ring 9.

In the clamping position shown in FIG. 1, the support 8 pushes with the force applied by the Belleville washer stack 4 the locking ring 9 against the straightening roller 1 and thus clamps this roller between the support 8 and a shoulder, not shown here, of the straightening roller pin 2. If the roller 1 is to be changed, first the support 8 has to be pushed against the force of the Belleville washer stack 4 so that the locking ring 9 can be turned in the release position and drawn off, then the roller 1 can be pulled off.

This motion of the support 8 is effected by means of a hydraulic actuator indicated here by the number 10. The actuator casing 11 forms a cylinder 12 for a stepped piston 13. The piston is sealed with respect to the cylinder by a suitable sealing device 14. Several compression springs 15 distributed round the circumference retain the piston 13 in the retracted position as long as the hydraulic liquid does not act on it. Hydraulic liquid is admitted to the cylinder 12 through a bore 16 connected, for instance, by means of a hose to a supply of hydraulic liquid. If no supply is available at the point where the installation is to be used, one could use, for instance, a hand pump, with pressure intensifier, if necessary. This equipment is then connected to the bore 16. It is also possible to mount a suitable pump on the actuator 10.

The actuator unit has at its front end a lug 17 approximately U-shaped in front view and formed so that it engages with an annular groove 18 of the support 8 when the actuator unit 10 is pushed across the longitudinal centerline on the support 8. In this way the two parts can be quickly and easily coupled together. When a pressure medium is admitted to the cylinder 12, the piston 13 moves until it comes to rest on the end 3b of the bolt. Then the support 8 begins to move against the force of the stack 4 of Belleville washers, so that the pressure acting on the locking ring 9 is removed and the ring 9 can be turned into its release position and drawn off so that the roller 1 can be taken out.

In the embodiment illustrated here, there is a bolt 3 screwed in towards the straightening roller pin 2. However, the stack of Belleville washers and the support can also be accommodated on a lug, pin, or the like projecting from the straightening roller pin.

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All features mentioned in the above specification or shown in the drawing can be regarded, individually, or in combination, as part of the invention, even if this is not specifically mentioned in the claims, provided that the known state of the art permits this.

We claim:

1. A device for detachably fixing or locating a part on a shaft comprising locking ring engaging with the part to be fixed, the locking ring resting on a support located on and displaceable or means projecting from the shaft and said support being biased by a spring toward the part being fixed said support being movable away from the part by the action of a pressure fluid against the force of the spring so as to enable the locking ring to be released, an actuator for moving the support against the spring force, the actuator having two parts capable of relative motion by the action of a pressure fluid, one of these parts being connected to the support while the other part rests against the end of the means projecting from the shaft.

2. A device according to claim 1, in which a casing of the actuator unit forms a cylinder for a piston displaceable in it.

3. A device as claimed in claim 1, in which the actuator unit

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has at least one lug or the like, capable of engaging into an annular groove of the support.

4. A device as claimed in claim 2, in which the actuator unit has at least one lug or the like, capable of engaging into an annular groove of the support.

5. A device as claimed in claim 3, in which the lug is in the shape of a fork or U.

6. A device as claimed in claim 4, in which the lug is in the shape of a fork or U.

7. A device as claimed in claim 3, in which the lug is in one piece with the casing of the actuator unit.

8. A device as claimed in claim 1, in which the actuator unit can be connected to the support by means of a shrouded nut or the like.

9. A device as claimed in claim 2, wherein the actuator is connected to the support by means of a shrouded nut or the like.

10. A device as claimed in claim 3, wherein the actuator is connected to the support by means of a shrouded nut or the like.

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