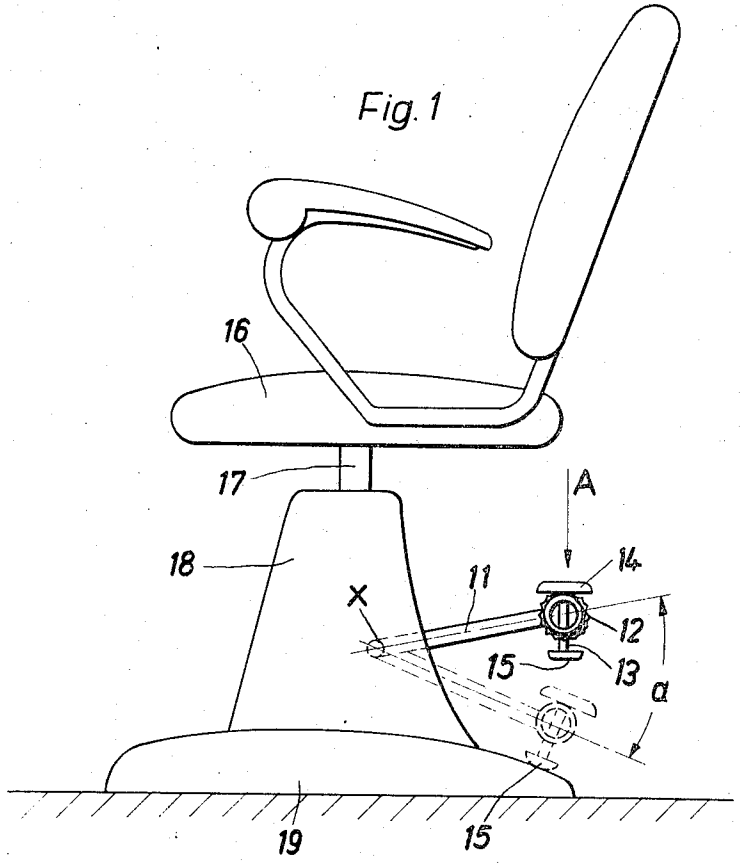
Oct. 17, 1967 H. E. WERNER 3,347,594

HYDRAULIC MECHANISM

Filed Sept. 8, 1966

Fig. 1



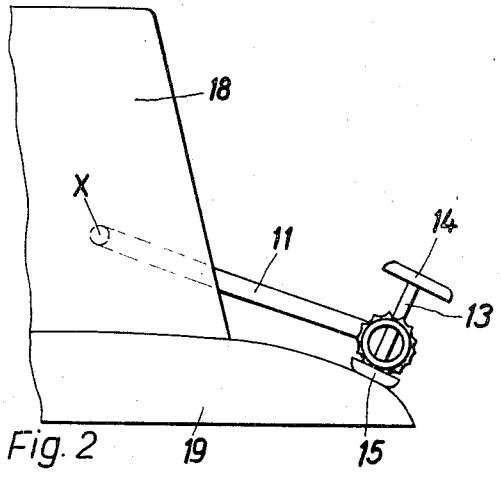


Fig. 2

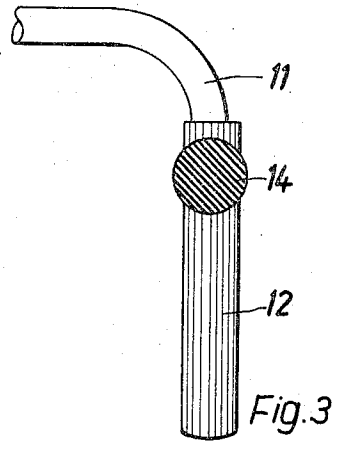


Fig. 3

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HYDRAULIC MECHANISM

Herbert E. Werner, 21 Jean Paulsweg, Hamburg 39, Germany

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3 Claims. (Cl. 297—347)

ABSTRACT OF THE DISCLOSURE

A hydraulic or pneumatic service chair operated by action of a pivoted lever connected to a pump installation, including a movable element providing a stop for the region of movement of the lever which causes upward pumping of the chair when a downward force is applied to the lever through the movable element and no longer provides a stop when a downward force is applied directly to said lever so that the lever activates downward movement of the chair.

The invention relates to a service chair, for example for hairdressing, with hydraulic or pneumatic operation of the seat by the use of pivoted lever connected to a pump installation.

In known service chairs of this form, a pivoted lever is connected with the pump installation for the seat through which the seat is moved upwards in steps by movement of the lever, and thereby operation of the pump installation. For releasing the seat a special lever is provided through the operation of which the seat is returned in a continuous movement to the rest (lowered) position.

It has been proposed to provide that the upward movement of the seat and the release movement of the seat into the lower rest position are effected by a single control, and for this purpose a spring element is provided with the pump lever, which is built into the hydraulic or pneumatic mechanism of the pump installation. When the seat is pumped upwards, the movement of the pump or pivoting lever is limited by the spring element. In order to return the seat to the lower rest position, it is then necessary to exercise a higher pressure on the pump lever, so that the resistance of the spring element is overcome by the operator, thereby to open the release valve for the movement of the seat into the lower rest position.

The foregoing method is disadvantageous for several reasons. If the point of pressure generated by the spring element between the pump and release regions of the movement of the lever is too weak, there is the danger that this point of pressure will not be noticed by the operator, especially if the seat is comparatively heavily loaded and a proportionately greater force is needed for the operation of the pump lever. Thus it frequently happens that the pump lever may be pressed to overcome the spring action, thus going beyond the limit of movement provided for pumping and thereby opening the release valve for a short time. This results in the disadvantage that the seat drops a little, this is uncomfortable for the occupier of the seat since the slipping back takes place jerkily on account of the load, and a hard impart may result.

In order to avoid this disadvantage, the operator can avoid use of the full stroke of the pump lever for raising the seat, i.e. he can stop at a point short of the end position of the pumping range of the lever. However, a further disadvantage then results in that the number of pumping strokes is increased. In addition, it is disadvantageous in that when the operator in fact wishes to move the lever into its end position the point of pressure on the pump lever is so strong that greater additional forces

must be applied by the operator to overcome this strong resistance in order to press the pump lever sufficiently far that the release valve is opened.

It is an object of the present invention to provide a service chair with hydraulic or pneumatic operation for the seat which does not display the aforementioned disadvantages, in which the known advantage of uniting pump lever **1** release mechanism in a single unit is retained, in which the operator can use up the full stroke of the pump lever, in order to raise the service chair, but in which the possibility is given to him in a simple manner and without exertion of moving the pump lever beyond the pumping region, thereby to obtain a lowering of the seat of the service chair.

According to the present invention there is provided a service chair adapted for hydraulic or pneumatic operation under the action of a pivoted lever connected to a pump installation, wherein there is provided on the pivoted lever a movable element which in one position constitutes a stop for the region of movement of the pivoted lever during which such movement causes the upward pumping of the chair seat, and is releasable from such stop position to permit movement of the lever to permit or cause downward movement of the chair seat.

According to a preferred form of the invention, the movable element constitutes the release means for additional movement of the pump lever in order to be able to move the chair seat to the lower position.

According to a particular form of the invention, the movable element is located transverse to the long axis of the pump lever and is displaceable substantially perpendicularly to the long axis of the pump lever. This movable element can be provided with an upper attachment, e.g. in the form of a disc, on which the foot of the operator bears during the pumping-up motion. Moreover, the movable element may be provided with a lower attachment in the form of a disc. Further, friction increasing means may be provided on one or both of said attachments.

A particular form of the invention is illustrated in the accompanying drawings, in which:

FIG. I shows a side view of a complete service chair.

FIG. II shows a partial view of the foot of the service chair, and

FIG. III shows a top view of the pump lever, seen in the direction of arrow A of FIG. I.

The service chair is provided with a pump lever **11**, movable in a vertical plane, which is pivotally fixed to the base of the chair at the pivot X, and which works together with a suitable hydraulic or pneumatic pump apparatus (not shown) for the chair seat. The free end of the movable pump lever **11** is turned through an angle and provided with an extension which takes the form of a profiled tube **12**, which can be made from rubber or plastic, or may be covered with rubber or plastic. The pump lever **11** has an aperture, in which is located a displaceable striking pin **13**, which is terminated at its end by discs **14** and **15**. A pedestal **19** carries a base **18**, to which the pump lever **11** together with the abovementioned parts is movably fixed, and in base **18** there is arranged a hydraulic or pneumaitc apparatus, which operates a pump piston **17**, which controls the seat frame or seat attached thereto.

In order to raise the seat **16**, **17**, the pump lever is moved over a region designated by *a* in FIGURE I. The lowering of the seat frame **16**, **17** is controlled by the same pump lever **11**, by means of a release valve (not shown), and in order to attain this, the pump lever **11** must be pushed beyond region *a* so that it rests on the foot of the pedestal **19**, as shown in FIG. II. Thereby, a release valve is opened, and the seat frame **16**, **17**

sinks down, so long as the pump lever **11** is held in this position by the operator.

For pumping up the seat frame **16, 17**, it is essential that the pump lever **11** is not moved from over the region *a* shown in FIG. I, for then the release valve would immediately be opened and the seat frame would sink. During the pumping process, in order to move the seat frame **16, 17** upwards, the operator holds his foot on the disc **14** fixed to the pin **13**, so that the movement of the pump lever **11** is limited by the grounding (on pedestal **19**) of disc **15** fixed to pin **13**. Thus, the whole stroke of the pump lever **11** can be used up, without the danger existing that the pump lever can be moved downwards from over the fixed region *a*.

The lower disc **15** is provided on its underside with a buffer of rubber or a plastic, so that the movement of pump lever **11** by pin **13** down is arrested elastically and softly. To secure the downward movement of the seat frame **16, 17**, the operator need only put his foot on a part of the profiled tube **12** (not covering the disc **14**). When the pump lever **11** has reached the lower boundary of the movement region *a*, the operator presses the pump lever **11**, with practically no resistance, right to the bottom, whereby the pump lever moves relatively to the stationary and resting pin **13**. Thereby the release valve for lowering the seat frame **16, 17** is opened. The movement is continued until the pump lever seats itself on to the upper side of the lower disc **15**, where its movement is arrested against the foot of the pedestal **19**. There occurs no hindrance to the movement of pump lever **11** beyond the end of region *a*, because the pump lever **11** can simply slide downwards on the pin **13** (cf. FIG. II). As soon as the pump lever moves itself upwards again, the pin slips, on account of its own weight, back into the starting position of FIG. I.

Thus, the invention provides a simple and reliable construction by which, without the application of any counterpressure or spring elements, first a sure movement

of the pump lever to the bottom of the pump region is secured, and further, through a simple foot movement and setting of the foot on the end **12** of the pump lever a downward movement of the seat frame is realised.

I claim as my invention:

1. In a fluid mechanical service chair having a pump installation operated by a lever pivoted at one end, the improvement comprising, a pin passing loosely through and substantially perpendicular to the free end of said lever, and a disc connected to the upper end of said pin preventing said pin from falling through said lever, said pin providing a stop for the region of movement of said lever which causes upward pumping of the chair when a downward force is applied to said lever through said disc said lever having an extension on which pressure may be applied with the foot without applying pressure to the said disc.

2. A service chair as defined in claim **1** wherein said disc is provided with a friction-increasing outer surface.

3. A service chair as defined in claim **1** wherein a buffer plate is connected to the lower end of said pin pushing said pin upward in said lever when a downward force is applied directly to said lever.

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FRANCIS K. ZUGEL, *Primary Examiner.*