United States Patent [19]

Pons

[11] **3,768,320**

[45] **Oct. 30, 1973**

[54] **MECHANISM FOR LOWERING AND RAISING CLOCKWORK PARTS INTO AND OUT OF A WORKING VAT**

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[22] Filed: **May 24, 1972**

[21] Appl. No.: **256,615**

Related U.S. Application Data

[63] Continuation of Ser. No. 87,729, Nov. 9, 1970, abandoned.

[52] **U.S. Cl.** **74/53,** 134/135, 134/164

[51] **Int. Cl.** **F16h 25/08,** G04d 3/08

[58] **Field of Search** 134/61, 77, 78, 85, 134/135, 164; 74/53

[56] **References Cited**

UNITED STATES PATENTS

2,447,351	8/1948	Marinsky et al.	74/53 UX
2,645,236	7/1953	Fisher	134/164 X
2,979,063	4/1961	Hilton	134/77

FOREIGN PATENTS OR APPLICATIONS

512,603	11/1930	Germany	74/53
746,954	9/1944	Germany	134/77

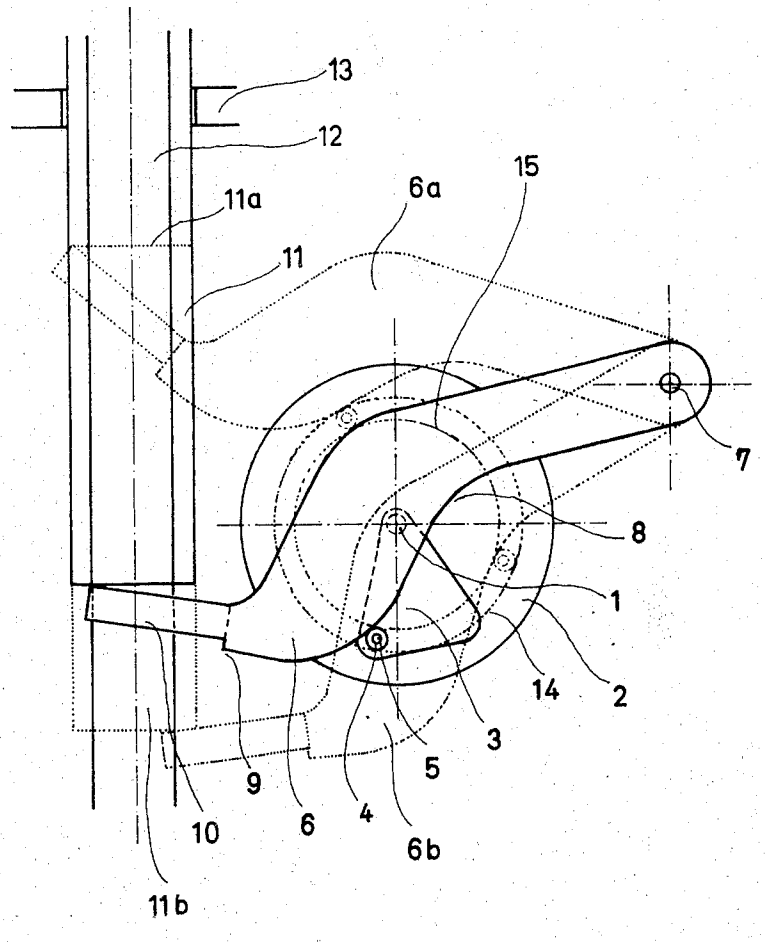
Primary Examiner—Daniel Blum

Attorney—Irvin S. Thompson et al.

[57] **ABSTRACT**

A machine for cleaning and rinsing clockwork parts wherein the support carrying said parts assumes a relative vertical and angular movement with reference to the vats to be used in succession. The relative vertical movement is controlled by a rotary crank raising and sinking a pivoting lever during each of its revolutions so as to make a member reciprocate vertically to produce the desired relative movement, the angular movement of the crank producing the vertical movement, corresponding to the removal of the parts out of a vat and to their draining being longer than the opposite movement returning the parts into the next vat whereby a longer draining time is allowed.

1 Claim, 1 Drawing Figure



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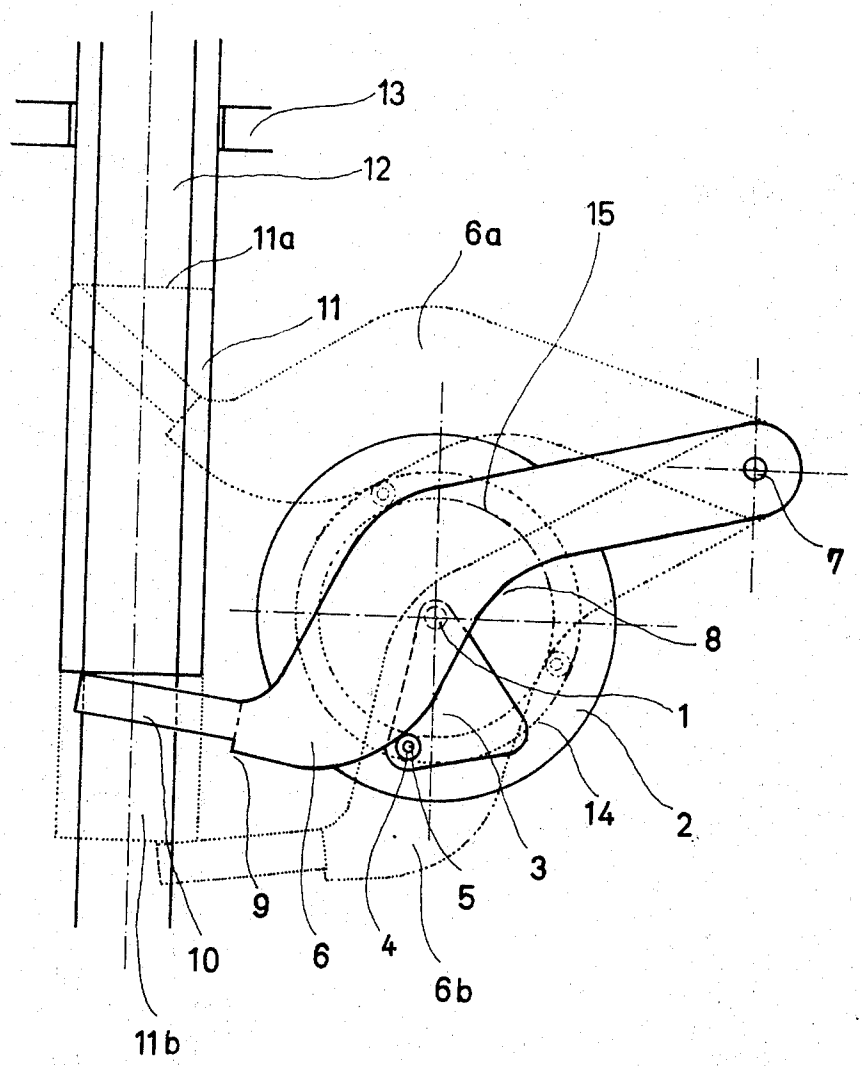

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MECHANISM FOR LOWERING AND RAISING CLOCKWORK PARTS INTO AND OUT OF A WORKING VAT

This is a continuation of application Ser. No. 87,729, filed Nov. 9, 1970, now abandoned.

My invention has for its object the provision of a machine for automatically cleaning clockwork parts by means of a machine including a motor connected through a suitable known mechanism with the support carrying such parts so as to stir the latter within washing and rinsing vats carried by the frame of the machine while a rotary draining movement in the presence of the atmosphere is applied to said parts between two successive baths. According to my invention, the time interval of a constant duration separating two successive stirring operations is subdivided into two periods of an unequal duration : a longer period during which the parts undergoing treatment are drawn out of the vats and a shorter period corresponding to the following immersion in the next bath, the first of said periods serving simultaneously for the draining of the parts.

The single FIGURE of the accompanying drawing illustrates diagrammatically an embodiment of my invention to be disclosed hereinafter by way of example.

As illustrated, the shaft **1** of the auxiliary motor **2** carries at its end a crank **3** constituted in the present example by a triangular plate. To said crank **3** there is secured at **5** a roller bearing **4.** A lever **6** pivotally secured at **7** to the frame of the machine, which is not illustrated, rests through its outline **8** on the outer surface of the roller bearing **4** carried by the crank **3.** Said lever **6** forms at its free end **9** a fork **10** adapted to raise the hollow cylinder **11** sliding along a guideway **12** and extending through circular guiding means **13.** The upper section of the cylinder **11** carried the mechanism of the machine which is not illustrated but which may be as in U.S. Pat. Nos. 2,447,351 or 2,979,063, to which reference is had for a fuller desc ription of this to which reference is had for a fuller description of this portion of the apparatus.

The operation of the arrangement is as follows:

At the start, the cylinder **11** lies in its lowermost position together with the support not illustrated, of the clockwork parts which have just been stirred within the vat carrying a washing liquid. The cylinder **11** is held in said position by the fork **10** terminating the lever **6.** The latter rests on the other hand through its edge **8** on the roller bearing **4** carried by the crank **3.** The auxiliary motor **2** being started, the roller bearing **4** is carried along clockwise by the crank **3** and executes a complete revolution round the axis of the shaft **1** at a uniform speed. The duration of one revolution round said axis should correspond to the duration of a complete rising and sinking cycle of the cylinder **11,** the extreme positions of the latter being drawn in dotted lines and provided with the index *a* for the upper position of the cylinder **11** and with the index *b* for its lower position.

In order to ascertain the extreme uppermost and lowermost positions of the lever **6,** I draw two geometrical circles **14** and **15** defining the path to be described by the roller bearing **4** round the axis of the shaft **1** of the auxiliary motor. It will be readily understood from inspection of the drawing that a line passing through the pivot **7** and tangentially contacting the upper part of the outer circle **14** defines the uppermost position of the lever **6** while the corresponding line tangentially

contacting the lower part of the inner circle **15** defines its lowermost position.

Obviously, the length of the path followed by the cylinder **11** as it rises depends on the length of the lever **6,** on the length of the crank **3** and on the ratio between the total length of the lever and the distance between the point on the edge **8** of the lever **6** engaging the roller bearing **4** and the pivot **7** of said lever for the extreme positions of the latter.

The preceding disclosure shows furthermore that the arc defined by the crank **3** during the sinking of the cylinder **11** under the action of the lever **6** is shorter than that followed by the crank **3** while it raises said cylinder. Obviously also, the difference between the rising and sinking periods is reduced when the pivot **7** is spaced by a longer distance from the axis of the shaft **1** of the motor **2.**

It is apparent that a change in the direction of rotation of the motor **2** leads to a reversal of the succession of the periods so that a slow sinking is obtained after a high speed rise. Such a modification lies within the scope of my invention as defined by the accompanying claim.

The speed or rotation of the shaft **1** is uniform in its principle and the travel of the roller bearing **4** remains always the same for the same lapse of time. It is therefore an easy matter to define the accurate angular position of the roller bearing with reference to the shaft **1** at any moment.

On the other hand, the position of the lever **6** is defined by the height of the rising or sinking movements to be obtained at selected moments since the cylinder **11** rests throughout its travel on the forked end **10** of the lever **6.**

The succession of the different positions of the lever **6** and of the roller bear-ing **4** at corresponding moments allows through calculation or by means of a simple diagram the curve to be drawn which determines the outline of the lever **6.** Obviously, the path along which the roller bearing **4** is to move is located in the example considered along the edge of the lever **6,** but it may lie along any other section of the lever, whether projecting or recessed.

It will thus be seen that the motor **2** drives the shaft **1** for rotation clockwise as seen in the drawing, and that during the rising movement of lever **6,** the roller bearing **4** will traverse a downwardly convex portion of edge **8;** while during the fall of the lever, the roller bearing **4** will traverse a downwardly concave portion of edge **8.** The result is that, along the convex portion during rising movement, the upper portion of the movement of lever **6** is relatively prolonged and so the time the clockwork parts are out of the washing vat and hence draining, will be correspondingly prolonged; while when the concave portion of edge **8** is being traversed during the fall of lever ever **6,** the lower protion of the descent of the lever will be relatively retarded.

What I claim is:

1. A mechanism for raising and lowering clockwork parts into and out of a washing vat, comprising a vertically shiftable member for carrying said parts, and means for shifting said member vertically comprising a motor, a horizontal shaft driven in rotation by the motor, a crank fixed to said shaft, a roller on the outer end of said crank, a lever having one end engaging said member to shift said member vertically, means pivotally mounting the other end of the lever for vertical

swinging movement of the lever about a horizontal axis, said ends of said lever lying on opposite sides of the vertical plane in which said shaft lies, the underside of said lever resting on said roller, said motor turning said shaft in a direction such that said lever rises during more than 180° of the rotation of said shaft and falls during less than 180° of the rotation of said shaft, the portion of said underside of said lever which contacts said roller during the rise of the lever being convex thereby to prolong the time during which the lever occupies a raised position and hence to prolong the time the clockwork parts are out of the washing vat, the portion of said underside of said lever which contacts said roller during the fall of the lever being concave thereby to retard the lower portion of the descent of the lever.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,768,320 Dated October 30, 1973

Inventor(s) Amédée Pons

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[30] Foreign Application Priority Data

February 13, 1970 France 7005339

Signed and sealed this 23rd day of April 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents