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INTERLOCKING DEVICE FOR ACTUATING MEMBER

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FIG. 1

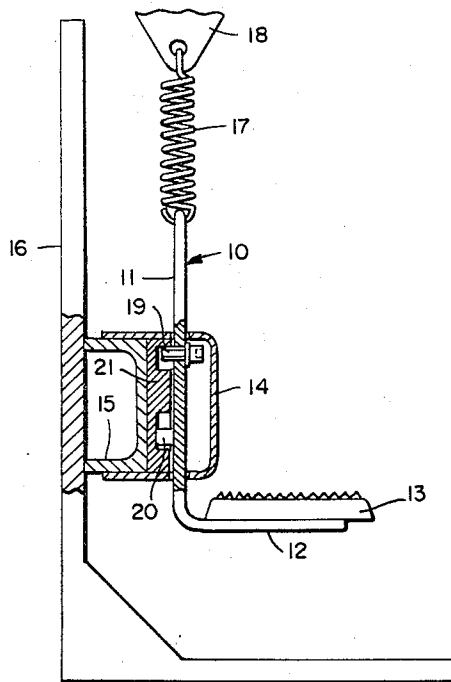
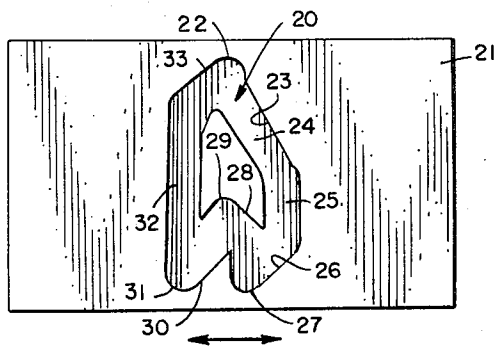


FIG. 2



INVENTORS:

KLAUS WEBER
ROBERT FUHRER
FRITZ URBACH

BY

Marzall, Johnston, Cocks Root
ATT'YS

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INTERLOCKING DEVICE FOR ACTUATING MEMBER

Klaus Weber, Remscheid-Lennep, and Robert Führer and Fritz Urbahn, Remscheid, Germany, assignors to Barmag Barmser Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

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B 65,811

5 Claims. (Cl. 74—527)

ABSTRACT OF THE DISCLOSURE

Resiliently biased, manually operated, actuating member adapted to reciprocate between at least two stop positions, in combination with locking member containing endless keyway and reciprocable substantially laterally to reciprocal movement of actuating member. Guide pin on actuating member rides in endless keyway, which has at least two stop notches.

Background of the invention

Foot or hand operated devices are used on many machines in the textile and other industries for activating the mechanical and/or electrical elements thereof. Foot operated actuators permit the machine operator to use his foot in operating the machine while having his hands free to do other manipulations. The invention herein concerns actuating members of these types wherein the actuator member has at least two stop positions in its reciprocal travel.

Many manually operated mechanisms are known in the art. They may be lever systems with ratchets and pawls or other interlocking elements. These machine parts are difficult to operate or are expensive to make and lack the operational safety. The purpose of the invention is the elimination of these disadvantages.

Brief description of the invention

The invention herein concerns a reciprocable actuating member having a guide pin. The guide pin rides in an endless keyway or groove of a locking member which is reciprocable in directions substantially laterally to the reciprocal movement of the actuating member. The actuating member is biased by a force accumulator, e.g., a spring, and the endless keyway or groove has at least two stop notches providing stop positions for the actuator member by blocking movement thereof under the urging of the force accumulator.

In a preferred form, the keyway or groove has the shape of an inverted, slightly distorted heart. One stop, i.e., a lower stop notch, lies between two lower points of the curve in the keyway. The other stop, i.e., an upper stop notch, is at the apex of the keyway.

The keyway is constructed so that the guide pin moves from the upper notch down one side of the keyway into one of the aforesaid lower points when the actuating member is moved against the bias of the force accumulator. At the lowest point, the actuator member is released, and the guide pin moves into the lower notch under the force of the force accumulator. Upon movement again of the actuating member against the bias of the force accumulator, the guide pin moves into the other of the aforesaid lowest points. Upon release of the actuator, the guide pin moves under the force of the force accumulator into the upper notch.

During the aforesaid travel of the guide pin in the keyway, the locking member containing the keyway is pushed sideways by the guide pin. The actuator member and its

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guide pin reciprocate in a straight line while the locking member is pushed in opposite directions substantially laterally to the motion of the actuator member and guide pin.

Description of the drawings

A preferred embodiment of the invention is illustrated in the drawings, wherein:

FIG. 1 is a side elevation, partly in cross section, of the spring-biased actuating member and locking members; and

FIG. 2 is a front elevation of the locking member and keyway therein.

Description of the preferred embodiment

The mechanism illustrated is adapted for use on many machines for applying and disengaging a brake, clutch or other machine element. The actuating member, as illustrated, is an L-bar 10 having a vertical leg 11 and a horizontal leg 12. A foot plate or pad 13 is mounted on the latter.

The leg 11 is guided in vertical movement in upper and lower slots of a housing 14, which is attached to the horizontal frame angle 15 of the machine base 16. A force accumulator, i.e., a coil spring 17, is attached to the leg 11 and a machine part 18. The machine part may be rigidly attached to the machine frame, in which case the leg 11 is linked to activating linkage for the brake, clutch or other element of the machine. Alternatively, machine part 18 may be part of the aforesaid activating linkage, in which case the spring 17 is a yieldable element of said linkage.

The leg 11 has a guide pin 19 projecting rearwardly into a keyway or groove 20 of the locking member 21. The locking member may be a rectangular plate slidably fitted for lateral movement in housing 14 between the front face of frame angle 15 and the rear face of leg 11. The leg 11 is moved against the bias of spring 17 by stepping on foot plate 13. Leg 11 is restricted to straight line, vertical movement. Locking member 21 is restricted to straight line, horizontal movement.

In the upper position of actuating member 10, the guide pin 19 is seated in the upper stop notch 22. When the actuating member 10 and guide pin is forced downward against the bias of spring 17, the guide pin strikes side wall 23 of diagonal groove segment 24. The locking member 21 moves to the left (as viewed in FIG. 2) as the pin 19 moves downwardly in groove segment 24. After the pin travels through vertical groove segment 25, it strikes diagonal wall 26. The locking member 21 is forced to the right by cam action of pin 19 on wall 26 until the pin bottoms in a first lowest point 27.

Upon release of the actuating member, the force of spring 17 raises guide pin 19 upwardly against diagonal wall 28 and thence into lower stop notch 29 as locking member 21 moves to the right (as viewed in FIG. 2).

When actuating member 10 is again depressed, guide pin 19 strikes diagonal wall 30 and then seats in a second lowest point 31 as locking member 21 moves further to the right. Upon release of the locking member, the force of spring 17 raises guide pin 19 through vertical groove segment 32. When pin 19 strikes diagonal wall 33, locking member 21 moves to the left until pin 19 is again seated in upper stop notch 22.

The keyway 20 provides two notch stops at apices in the keyway. As can be seen from FIG. 2, the keyway has the shape of a slightly distorted, inverted heart.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from

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the spirit or scope of the invention, or sacrificing any of its attendant advantages, the form herein disclosed being a preferred embodiment for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A mechanism comprising an elongated actuating member, means mounting said member for longitudinal reciprocal movement, means biasing said member in one direction of said movement, a guide pin projecting from said member, a locking member having an endless keyway, means supporting said locking member for reciprocal movement substantially at a right angle to said movement of said actuating member, said guide pin riding in said keyway, and said endless keyway having two stop notches and camming surfaces coacting with said pin, said camming surfaces reciprocating said locking member laterally as said pin moves between said stop notches.

2. A mechanism as claimed in claim 1, wherein said actuating member is mounted for substantially vertical movement on a frame member, and a horizontal foot plate mounted on the lower end of said actuating member to provide a foot operated mechanism having at least two stop positions determined by said stop notches.

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3. A mechanism as claimed in claim 1, wherein said endless keyway is a groove of inverted, slightly distorted heart shape.

4. A mechanism as claimed in claim 3, wherein said actuating member is mounted for substantially vertical movement on a frame member, and a horizontal foot plate mounted on the lower end of said actuating member to provide a foot operated mechanism having at least two stop positions determined by said stop notches.

5. A mechanism as claimed in claim 4, and a coil spring attached to the upper end of said actuating member and urging said actuating member upwardly.

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20 FRED C. MATTERN, JR., *Primary Examiner*.

C. F. GREEN, *Assistant Examiner*.