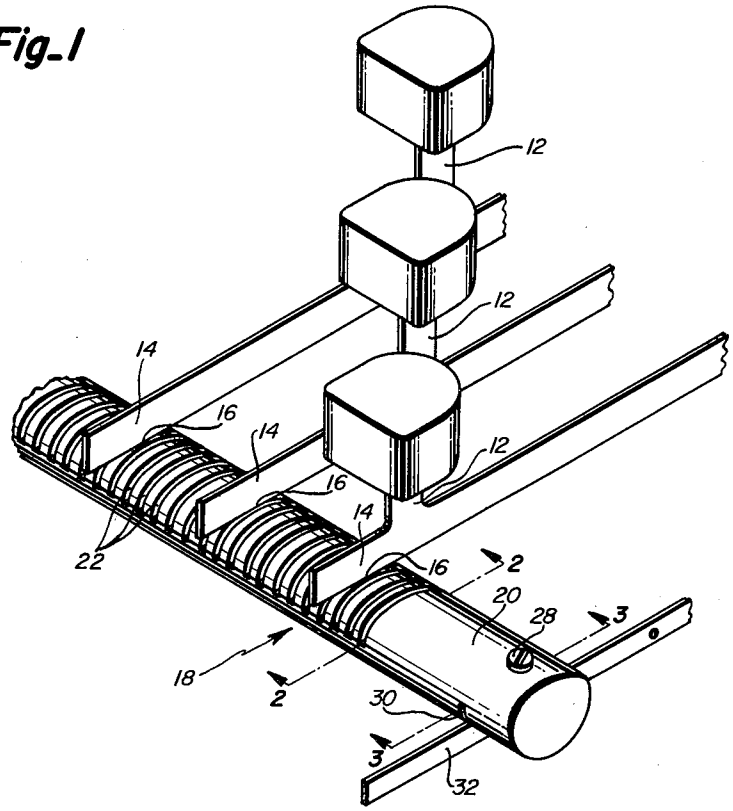
May 1, 1962 J. M. REYNARD 3,032,168

KEYBOARD LOCK AND/OR INTERLOCK FOR TYPEWRITERS AND LIKE BUSINESS MACHINES

Filed Feb. 23, 1961

Fig_1



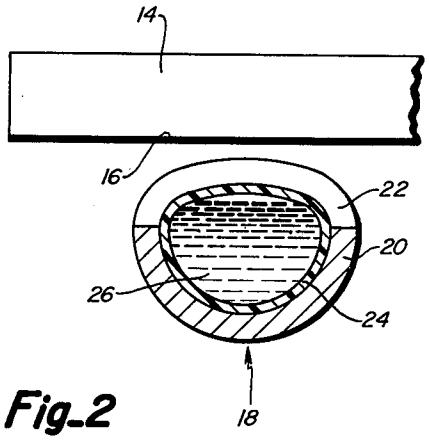
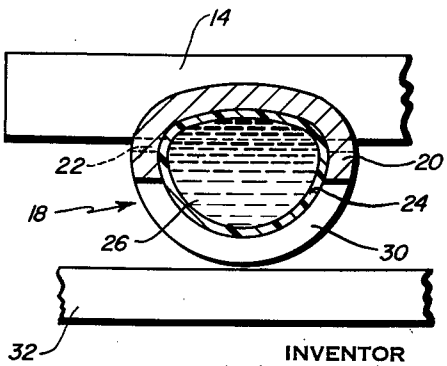


Fig_2

Fig_3



INVENTOR
JOHN M. REYNARD
BY Thomas S. Ross
Joseph R. Stella
ATTORNEYS

United States Patent Office

3,032,168

Patented May 1, 1962

3,032,168

KEYBOARD LOCK AND/OR INTERLOCK FOR TYPEWRITERS AND LIKE BUSINESS MACHINES

John M. Reynard, Tariffville, Conn., assignor to Royal McBee Corporation, Port Chester, N.Y., a corporation of New York

Filed Feb. 23, 1961, Ser. No. 91,193
4 Claims. (Cl. 197—107)

This invention relates to a keyboard lock and/or interlock for typewriters and like business machines; more particularly it relates to a keyboard lock and/or interlock characterized by a contained resilient fluid element which permits the full depression of only one key at a time of the machine keyboard.

Prior art keyboard locking devices all involve a multiplicity of parts with concomitant fabrication, assembly, and adjustment problems. Further the abrupt termination of a key lever stroke by the mechanical stops of prior art locking devices produces an objectionable touch or solid lock out.

Accordingly, an object of the invention is to provide a simple locking device having a minimum of easily fabricated, assembled and adjusted elements.

Another object is in the provision of a resilient locking device which avoids key lever jamming and shock at the termination of a key lever stroke.

A further object of the invention is in the provision of an interlocking device which serves to prevent the simultaneous operation of two type actions.

A still further object of the invention is in the provision of a resilient keyboard interlocking device whose resiliency may be adjusted to suit the touch of an operator.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIGURE 1 is a perspective view of a locking element in accordance with the invention in association with key levers of a keyboard of a typewriter or like machine;

FIGURE 2 is a cross sectional view of the locking element taken along lines 2—2 of FIGURE 1; and

FIGURE 3 is a view along line 3—3 of FIGURE 1.

Referring now to the drawings wherein a preferred embodiment is illustrated, there is shown in FIGURE 1 several key levers **12** which may be considered representative of the other key levers of a full complement of key levers associated with an electric typewriter. The key levers are designed with forwardly extending projections **14** such that when mounted the projections are aligned with their lower edges **16** defining a horizontal plane. Extending across the machine beneath the edges **16** is a locking element generally designated by reference numeral **18**. The locking element comprises a rigid tubular housing **20** which is secured by any suitable means to the machine frame. The housing **20** is provided with a plurality of slots **22** adapted to be aligned below edges **16** thereby to receive the key lever projections **14** when the keys are depressed. Within the housing **20** is a closed or sealed resilient tube **24** containing an incompressible fluid **26** which is dimensionally stable under environmental conditions to be normally encountered in practice. The composition of the resilient member **24** is generally impervious to deterioration by the fluid contained therein

and is resistant to fatigue and abrasion. In one embodiment of the invention rubber was employed as the resilient member **24** and water as the fluid **26** contained therein; though it is to be understood that substitutes for these materials are within the scope of the invention.

As shown in FIGURE 2 the tube **24** is substantially filled with fluid **26** and inserted into the rigid outer housing **20** whose ends are closed thereby constraining the tube **24** on all sides. The housing has mounted on one end an adjustment screw **28** adapted to press on the resilient member **24** thereby adjustably reducing the volume of the resilient member. To adjust the locking device one key is depressed, as shown in FIGURE 3, and the adjustment screw **28** is screwed in thereby reducing the volume of the resilient member **24** such that the fluid **26** occupies all of the available space and the depressed key begins to rise. When this condition is reached it is apparent that other keys cannot be depressed since the fluid is incompressible. The width of the slots **22** is much smaller than the thickness of the resilient member **25** such that its deformation into the slots by fluid pressure due to the depression of a second key while one key remains depressed is negligible, thereby preventing the depression of the second key. As shown in the figures the cross sectional shape of the elements comprising the locking element is such that if two keys are simultaneously depressed, their combined pressure will allow less than the normal dip required to trip an action.

As shown in FIGURE 1 a slot **30** is also provided on the underside of the housing **20** which is adapted to receive a lever **32** operable in response to the loss of power or other means as will be understood by those skilled in the art whereby the entire keyboard may be rendered ineffective.

It should be understood that the foregoing disclosures relates to only a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

The invention claimed is:

1. In combination with a business machine having a plurality of levers individually operable through predetermined operative strokes, locking apparatus comprising a resilient sealed hollow tubular member, a dimensionally stable fluid occupying less than the full volume of said member, a rigid enclosure surrounding said member, said enclosure having a plurality of slots therein adapted to receive associated ones of said levers, and means mounting said enclosure adjacent said levers such that said slots are aligned with associated levers and such that the operation of a lever through its operative stroke will deform said resilient member and cause the fluid therein to be displaced, said displaced fluid acting to prevent the operation of a subsequently operated lever through its predetermined operative stroke.

2. In combination with a typewriter having a plurality of key levers adapted to be selectively serially depressed through an operative stroke to effect typing; locking apparatus adapted to be secured beneath said key levers and extending from side to side of the typewriter, said apparatus comprising a resilient sealed hollow member, an incompressible fluid occupying less than the full volume of said member, and a rigid enclosure surrounding said member for preventing deformation of said member by fluid pressure, said enclosure having a plurality of slots one associated with each of said key levers exposing said member to said key levers whereby depression of a key

lever through an operative stroke deforms said member and displaces the fluid therein, said displaced fluid effectively preventing the depression of a subsequently depressed key lever through an operative stroke before the release of the first depressed key lever.

3. Apparatus as recited in claim 2 further comprising means for adjusting the volume of said resilient member.

4. Apparatus as recited in claim 2 wherein said fluid is water.

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