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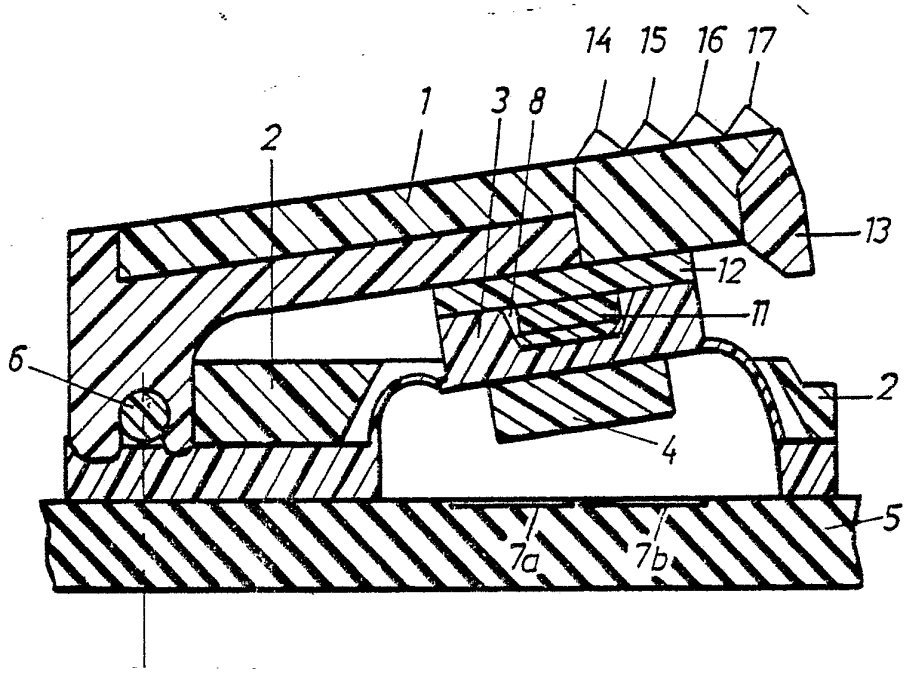
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(54) Title: MECHANISM IN KEYS FOR KEYBOARDS



(57) Abstract

A mechanism for keys for keyboards consists of a key (1), which is pivotably mounted about a mounting (6), and a rubber bubble (3) arranged under the key (1). The rubber bubble has a conductive block (4) and is a part of a rubber mat laid on a circuit board (5). When the key is depressed, the block (4) first will touch a contact point (7a) on the circuit board (5), and for continued depression it will touch a second contact point (7b). There is thus obtained a positive contacting function when both contact points (7a, 7b) are bridged by the block (4).

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MECHANISM IN KEYS FOR KEYBORDS

TECHNICAL FIELD

The invention relates to a mechanism in keys for keybords, including a key pivotably mounted about an axis, and a contact means in the form of a rubber bubble disposed under the forward part of the key, said bubble providing contact between a pair of electric conductors disposed on a flat substructure, e.g. a circuit board, under the rubber bubble. Such a key mechanism is a unit among a plurality of similar mechanisms on a keyboard panel for office equipment systems, e.g. in the field of telephony.

BACKGROUND ART

Similar key mechanisms are already known, such as described in the US patent 4.128.744, where there is disclosed a push button mechanism with a pivotably mounted button and a contact element in the form of a rubber bubble arranged under the button, the bubble collapsing on activating the push button so that contact is provided with the aid of contact elements under the rubber bubble.

DISCLOSURE OF INVENTION

The use of a rubber bubble as a contacting means cause problems in preventing unintentional opening or closing functions at the start and termination of the contacting sequence. Conventional buttons with a rubber bubble, e.g. according to the US patent mentioned above, have piston movement. The member, under the rubber bubble, providing contact must therefore be guided such as to be parallel to the contact surface, for ensuring that there will only be one closure when the button is depressed. This is impossible in practice, since the rubber bubble collapses non-uniformly around its own perifery. This results in that the conductive rubber bubble is also activated during the depression sequence and tips backwards and forwards, which may result in undesirable breaking functions occurring during the contacting sequence.

The invention is based on the fact that the contacting sequence can be

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controlled by a key mechanism, since the key turns about a mounting centre at its rear edge, which results in that the rubber bubble can be inclined a given number of degrees. This construction enables a contact point on the rubber block to come into contact with the substructure first, subsequent to which a second contact on the block comes into contact with the substructure.

The object of the present invention is thus to provide a key mechanism giving an improved and uniform contact between the contact points in the mechanism.

The invention is distinguished as will be seen from the characterizing portion of claim 1.

BRIEF DESCRIPTION OF DRAWINGS

The invention will now be described in detail with reference to the appended drawing, where Figure 1 illustrates the key mechanism in accordance with the invention in a rest position, and Figure 2 illustrates the same mechanism in a depressed position.

BEST MODES OF CARRYING OUT THE INVENTION

The key mechanism in accordance with the invention is illustrated in cross section in Figure 1 along a longitudinal centre line on the upper side of the key. The key 1 is of an implementation known per se, and the rear part 1a thereof is mounted on a shaft 6, the key being pivoted about the shaft 6 on the application of pressure to the forward part 1b, as is known in the art. The forward part 1b is suitably provided with a plurality of beads or ridges 14, 15, 16, 17, for facilitating depression and preventing slipping. On the underside of the forward part there is an intermediate piece 12, and on this guide in the form of a chamfered cylindrically shaped portion 11.

A rubber mat with a bubble 3 of known embodiment is placed under the key 1, and is kept in place by a frame 2 and a substructure in the form of a circuit board 5. The rubber bubble 3 is formed with a depression 8 to

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give space for the cylindrically shaped portion 11. The rubber mat together with the bubble is of a known kind, e.g. such as is sold by Gummi Maag. On the underside of the rubber bubble, nearast to the cylindrically shaped portion 11 there is a block 4 in the form of a cylindrical part with a flat bottom surface, which is directed towards two contact points 7a, 7b, e.g. gold plated points, on the circuit board 5. The block 4 is usually vulcanized to the underside of the rubber bubble, as shown in the figure, and consists of conductive rubber, for example. In the rest position according to Figure 1, the flat surface of the block 4 forms a given (acute) angle with the flat surface of the substructure. When the forward portion of the key 1 is depressed, the key is pivoted about the shaft 6 and the position of the rubber bubble is affected. Since the rubber bubble is inclined from the start, so that the lower surface 4a of the block 4 forms a given acute angle with the horizontal plane, the block 4 will first meet the left-hand contact point 7a and for continued depression the right-hand contact point 7b. Conversely, when the key is released from its position according to figure 2, the right-hand point 7b will relinquish contact with the rubber block 4 first, and subsequently the left-hand contact point 7a.

Thus, by utilizing the properties of a key mounted pivotably in combination with a rubber containing a conductive block, there is obtained a reliable and well-defined contact function.

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CLAIMS

1. A mechanism in keys for keyboards including a key (1) with a forward and a rear part (1a, 1b), which is pivotably mounted, and a contacting means in the form of a rubber bubble (3) arranged under the forward portion (1a) on a flat substructure (5) such that when the forward part of the tangent (1) is depressed contact is established between two electrical conductors (7a, 7b) arranged on the flat substructure (5), characterized in that the rubber bubble (3) is provided with an electrically conductive block (4), having a substantially flat contacting surface, a connection mat including the rubber bubble (3) being adapted in relation to the key (1) such that said contacting surface forms, in the inactuated position of the key, a given acute angle relative said flat substructure, and in that when the key is actuated by depression, the contacting surface first contacts one electrical conductor (7a) and for continued depression to a final position contacts the second conductor.

2. A mechanism as claimed in claim 1, characterized in that the key in the mechanism is provided on its underside with a guide (11) co-acting with a depression (8) on the upper side of the rubber bubble (3) for limiting the lateral movement of the rubber bubble when the key (1) is depressed.

3. Mechanism as claimed in claim 2, characterized in that the block (4) is vulcanized to the underside of the rubber bubble and is placed symmetrically in relation to said guide (11).

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Fig. 1

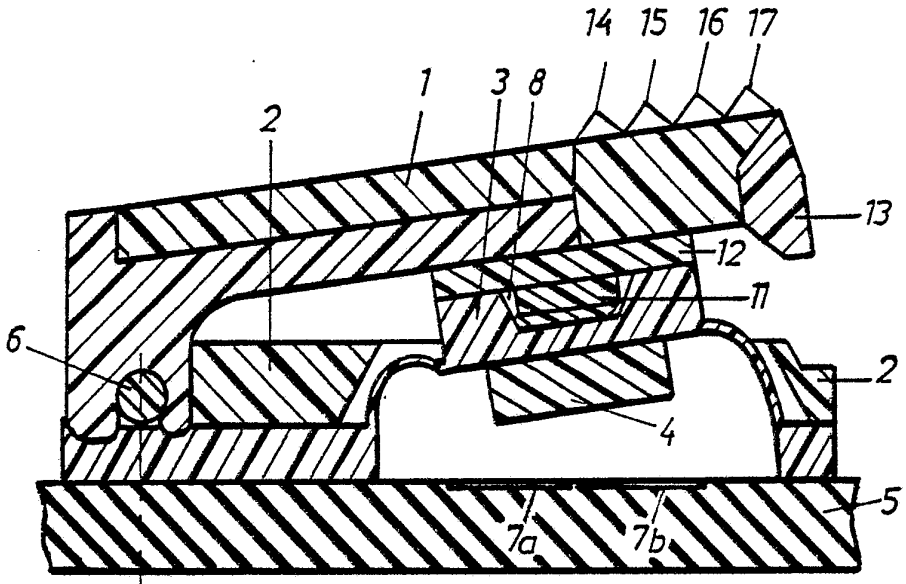
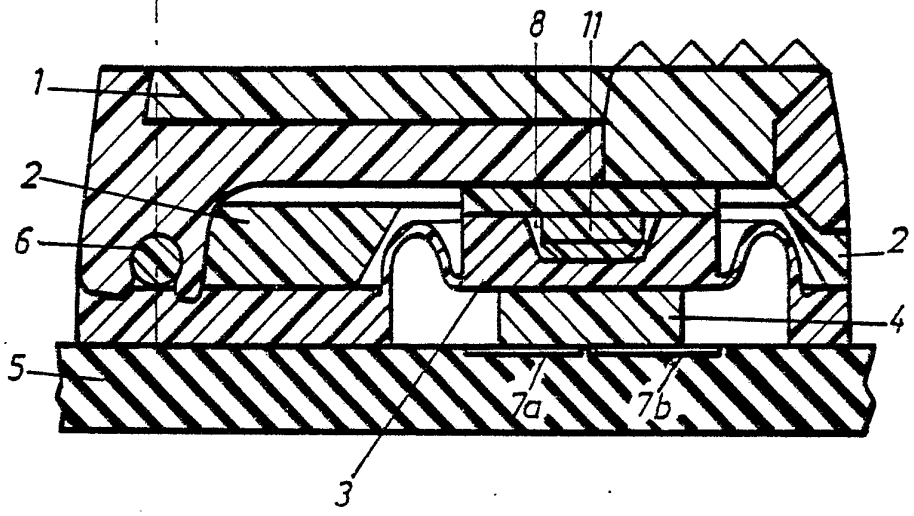


Fig. 2



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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE83/00308

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC [3]

H 01 H 13/52 // H 04 M 1/23, G 06 F 3/02

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	H 01 H 5/00,30, 13/00-52, 70, 23/00-30, H 04 M 1/23, 26, G 06 F 3/02
US Cl	200:5, 159

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
A	US, A, 4 323 740 (BALASH) 6 April 1982	1-3
A	US, A, 3 829 646 (LORTEIJE ET AL) 13 August 1974	1
A	DE, A, 2 230 479 (PHILIPS PATENTVERWALTUNG GMBH) 10 January 1974	1
A	GB, A, 2 058 462 (SHIN-ETSU POLYMER CO) 8 April 1981	1-3

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
1983-12-01	1983 -12- 07
International Searching Authority [1]	Signature of Authorized Officer [20]
Swedish Patent Office	Bertil Nordenberg