
Candidate's Answer (B)EPO
Munich

29/3/01

Dear Sirs

European Patent Application No _____

In response to the Examination Report of [date] with respect to the above application, we are filing herewith in triplicate revised pages xx - xx and ask that these replace the corresponding pages currently on file.

The Examiner will see that we have amended claim 1 to specify that the annular spring portion which is configured to activate second activates by undergoing a snap transformation as contact is made and a predetermined minimum switching force is applied.

The Examiner will note that in the specific example described in the present application, it is the first annular spring portion which is configured to activate second and which activates by undergoing a snap transformation.

Nonetheless, it is clear from page 1 lines 11-18 of the description that either annular spring portion may activate first. It is also clear from page 4, lines 4-12 that it is important that the snap transformation should occur as contact is being made to indicate that contact is being made and to ensure a predetermined minimum switching force. It is therefore clear that the snap deformation should take place during the second activation of an annular spring portion as contact is made. We therefore submit that the amendments made to claim 1 do not contravene Art. 123(2) EPC.

With respect to the dependent claims, claim 2 is directed to the specific embodiment in which the second annular spring portion activates first.

Claims 3 and 4 correspond to previous claims 2 and 3.

Basis for new claim 5 can be found on page 2, lines 14-18 of the description.

Claims 6 and 7 correspond to previous claims 5 and 6.

With respect to the documents cited by the Examiner, D2 discloses a switch control unit in accordance with previous claim 1. However, neither of the annular spring portions (37 or 44) undergo a snap transformation. Therefore, new claim 1 is novel over D2.

D3 also discloses a switch control device comprising two annular spring portions 16 and 17, the second annular spring portion 17 being arranged coaxially around the first annular spring portion 16. In D3, the second annular spring portion 17 deforms first, as shown in Figs 1a and 1b, and the first annular spring portion 1b deforms second, as shown in Figs 1c and 1d. The second annular spring portion 17 undergoes a snap transformation ie the portion which is configured to

activate first, not second as specified in claim 1. Furthermore, the snap transformation does not occur as contact is made, but occurs after contact is made, for the purpose of breaking contact as shown in Fig 1c and described on page 2 lines 1-7. Claim 1 is therefore novel over D3.

With respect to D1, cited in the present application, this document does not disclose annular spring portions arranged coaxially, nor does it disclose a snap transformation of either of the spring portions, Claim 1 is therefore novel over this document.

We believe that document D2 should be considered as the closest prior art for consideration of inventive step. According to the Guidelines C-IV 9.5, the closest prior art may be a known combination which discloses technical effects, purposes or intended use most similar to the claimed invention. In particular, the purpose and interaction of the features of D2 is more similar to the claimed invention than that of D3.

In D2, the outer spring portion 37 deforms first, until the actuator reaches the switching assembly. The inner spring portion 44 then deforms until the stop member 42 reaches the switching assembly, at which time at least a minimum contact pressure is being applied.

The problem associated with D2 can be seen as providing an indication to the operator that contact has been made and that a minimum switching force has been supplied to ensure reliable switching. This problem is not disclosed or suggested in D2.

According to the present invention, the solution to this problem is to provide a snap transformation of the spring portion which is second to deform as contact is made.

This solution would not be obvious for the teaching of D2 alone, which does not mention the use of a snap transformation.

D3 discloses a switch in which a snap transformation of a spring portion occurs. However, the teaching of this document is that a snap transformation may be utilised to cause disconnection of contacts after contact has been made.

D3 mentions, on page 2 at lines 6-7 that the user feels a momentary slight reduction in resistance as the snap transformation takes place, but this does not serve to indicate to the operator that contact has been made and that a minimum switching force has been applied. Therefore, the skilled man would not see the teaching of this document as relevant to the solution of the problem as set out above and would not combine these documents D2 and D3 to arrive at the claimed solution.

Should the Examiner consider D3 to be the closest prior art, starting from D3, the problem is to provide more reliable switching by providing an indication to the operator when contact takes place and when a minimum switching force is applied.

To arrive at the claimed solution it would be necessary to modify the inner portion 16 to undergo a snap transformation when contact takes place (ie the point shown in Fig 1b).

Although D3 utilises a snap transformation of the outer portion 17, this is for a completely different purpose of disconnecting the contacts and avoiding contact bounce. There is no suggestion that a snap transformation may be utilised for any other purpose. Furthermore,

D3 does not recognize the problem of providing an indication to the operator when a minimum switching force is applied. There would therefore be no motivation for the skilled man to modify the device of D3 to arrive at the claimed invention.

In view of the above, should the Examiner still be mindful to reject the application, we formally request Oral Proceedings.

Yours faithfully,
P. Attorney

Claims

1. A switch control device (10) comprising a first annular spring portion (14) and a second annular spring portion (16) arranged coaxially around the first annular spring portion (14),

wherein one of the annular spring portions (14, 16) is configured to activate before the other,

characterised in that the annular spring portion which is configured to activate second is configured to activate by undergoing a snap transformation as contact is made and a predetermined minimum switching force is applied.
2. A switch control device according to claim 1 wherein the second annular spring portion (16) is configured to activate before the first annular spring portion (14).
3. A switch control device according to claim 1 or 2 comprising a protrusion (22), the first + second annular spring portions being arranged coaxially with respect to the protrusion.
4. A switch control device according to any one of the preceding claims further comprising an annular abutment (20) arranged between the first + second annular spring portions (14, 16).
5. A switch control device according to any one of the preceding claims which is integrally formed from an elastomeric material.
6. A push button switch comprising a membrane switch, and a switch control device (10) according to any one of the preceding claims for operating the membrane switch.
7. A keyboard comprising a plurality of switch control devices (10) according to any one of claims 1 to 5.