



HU000028229T2

(19) **HU**(11) Lajstromszám: **E 028 229**(13) **T2****MAGYARORSZÁG**
Szellemi Tulajdon Nemzeti Hivatala**EURÓPAI SZABADALOM**
SZÖVEGÉNEK FORDÍTÁSA

- (21) Magyar ügyszám: **E 07 017931**
- (22) A bejelentés napja: **2007. 09. 13.**
- (96) Az európai bejelentés bejelentési száma:
EP 20070017931
- (97) Az európai bejelentés közzétételi adatai:
EP 1903585 A2 **2008. 03. 26.**
- (97) Az európai szabadalom megadásának meghirdetési adatai:
EP 1903585 B1 **2015. 10. 07.**
- (51) Int. Cl.: **H01H 1/00** (2006.01)
H01H 10/21 (2006.01)
H01H 1/06 (2006.01)

(30) Elsőbbségi adatok: 102006043795 2006. 09. 19. DE	(73) Jogosult(ak): Johnson Electric Germany GmbH & Co. KG, 26127 Oldenburg (DE)
(72) Feltalálók(k): Bertram, Rolf, 34286 Bergheim (DE) Koepsell, Martin, 26135 Oldenburg (DE) Stenzel, Bruno, 26209 Hatten (DE)	(74) Képviselő: Danubia Szabadalmi és Jogi Iroda Kft., Budapest

- (54) **Kapcsoló-érintkező súlycsökkentett érintkezőrugóval**

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Switching contact having a weight reduced contact spring

DESCRIPTION

[0001] The invention concerns an electrical switch, in particular an electrical microswitch, comprising at least one electrical contact, wherein the contact is designed as a hollow form section of a component of an electrically conducting material.

[0002] Electrical switches are deployed in electrical circuits, for purposes of switching electrical loads on and off. Such circuits are often miniaturised so that they can also be integrated in complex technical devices. In particular miniaturised switches are deployed in vehicle construction; these control various functions in a vehicle. Such microswitches are to be found, for example, in door locks, engine bonnets, tailgates, and in the vehicle interior.

[0003] Electrical switches, in particular microswitches, have at least one electrical contact, which is directly involved in the conduction of the electrical current. For this purpose the contact consists of an electrically conductive material; it can be applied onto a counter-contact, or onto other electrically conducting sections, in order to enable a flow of current.

[0004] In the prior art contacts are deployed that are produced from solid material. In a further operational step the solid material is attached to the contact carrier. What is usual is to weld on lengths of wire to form a contact, or to rivet contacts into the carrier material. Silver (alloys), or coating materials with silver and copper components, find application as the solid material. What is common to these materials is a low hardness.

[0005] Contacts made of solid material have an increased mass, which causes problems by virtue of the highly dynamic nature of the switching process. One problem of a high mass is, for example, that when it is applied to a counter-contact, vibrations can occur, which cause a temporary lifting of the contact from the counter-contact. This is particularly the case if the contact is introduced onto the counter-contact in an accelerated manner. With such an impact on the contact pulsed phenomena can occur, which cause multiple lifting of the contact, as a result of which the flow of current that is actually required is interrupted.

[0006] A switch of the generic kind is of known art from FR 2 504 311. In this switch the contact is not produced from a solid material. Instead the design is that of a hollow form section, as a result of which an outer form resembling that of a contact made of solid material is made possible; on the other hand, however, a considerable reduction of the mass of the contact is achieved.

[0007] The contact of the switch of known art from this document has two hollow form sections, which are angled sections of a hollow cylinder. They are arranged in rigid contact, since they are stiffened with a rear panel. The reduction of the mass of the contact can thus only lead to insufficient damping of the oscillation characteristics.

[0008] The object underlying the invention is that of demonstrating an electrical switch of the generic kind cited in the introduction, in which the occurrence of oscillations when introduced onto a counter-contact is effectively reduced.

[0009] The said object is inventively achieved in that the contact has a hollow cylindrical form, and the hollow form is designed from a planar material by reshaping the same, wherein the contact is designed by rolling up the

material of the component arranged in the front region of the component, and contact surfaces are located in surface regions of the contact.

[0010] In accordance with the invention provision is made for the contact to have a hollow cylindrical form. By means of the hollow cylindrical form a contact surface is designed using the sleeve of the cylinder, which can be applied onto counter-contacts of various designs. The counter-contact can preferably also have a cylindrical form; the two longitudinal axes of the cylinders can thereby run at an angle of approximately 90° to one another. Counter-contact and contact then form an optimal point-form (circular-form, when flat spots have been taken into account) contact point, which maintains its optimal form even in the event of angular errors in the contacts involved.

[0011] For the further development of the invention provision is made for the hollow form to be designed from a planar material by reshaping the same. The plane material can be an electrically conducting material that has been formed, for example, by a stamping process. In the inventive switch no solid material contact led from the outside is to be applied onto the said plane material; instead the contact designed as a hollow cylindrical form is formed by rolling up the material itself. By this means the production of the inventive electrical switch is also simplified.

[0012] In accordance with the invention the contact is designed by rolling up the material of the component arranged in the front region of the component. Here surface regions of the contact have contact surfaces. With these contact surfaces, the contact can be applied onto a counter-contact. A plurality of contact surfaces are present, with which application onto counter-contacts differing from one another is possible.

[0013] The fixed contacts can similarly be formed by reshaping without additional solid material.

[0014] In accordance with the invention an operational step (the joining of the solid material onto the carrier) is saved in production, and overall the contact characteristics are improved compared with the prior art. Soft material is not applied; the harder base material better withstands the mechanical stresses during the switching impact. The result is zero, or only minimal, plastic deformation. During the switching process there are relative movements of the contact surfaces. Harder surfaces better withstand the frictional wear that results from this. If, as proposed, the contact surfaces are formed by reshaping (e.g. rolling, stamping), a further increase in hardness ensues as a result of the reshaping process.

[0015] In accordance with the prior art contacts that conduct low currents (control currents) are provided with a noble metal layer, preferably gold (alloys). When a solid material is used the surface area that is ennobled is typically larger than that which is necessary for the switching function, and e.g. provided with a noble metal layer.

[0016] In accordance with a development of the invention a noble metal layer is selectively applied only at those regions involved in the switching function, as a result of which noble metal is saved. In the inventive configuration the contact surfaces have a greater hardness than that in the case of the solid material. The greater hardness enables a reduction of the layer thickness. In certain applications with this design the noble metal layer can be dispensed with on one side, or as pure transport protection can be reduced to an absolute minimum, since the functionally necessary noble metal layer ensues as a result of material transfer from the counter-contact. The contact surfaces thus formed are better suited to the electrical and mechanical stresses than the contact surfaces

made of solid material.

[0017] An example of embodiment, from which further inventive features ensue, is represented in the figures. Here:

Fig. 1: shows a plan view of a component of an electrical switch with an electrical contact, and

Fig. 2: shows a side view of a contact in accordance with Fig. 1.

[0018] The component of the switch in Fig. 1 takes the form of a stamped component 1 made from an electrically conducting material. An electrical contact 2 is designed in one section of the said stamped component 1. The said contact 2 is integrally connected with the other regions of the stamped component 1.

[0019] Fig. 2 shows that the contact 2 has a hollow cylindrical form. The contact 2 is designed by rolling up the material of the stamped component 1 arranged in the front region of the stamped component 1. The angles α and α' indicate the surface regions of the contact 2, in which contact surfaces 3 of the contact 2 are located. With these contact surfaces, the contact 2 can be applied onto a counter-contact, which is not represented further.

[0020] The stamped component 2 consists, for example, of brass, which has a thickness of approx. 0.5 mm. A noble metal layer is introduced into the brass in the region of the contact surface 3.

Kapcsoló-érintkező súlycsökkentett érintkezőrugóval

Szabadalmi igénypontok

1. Villamos kapcsoló, különösen villamos mikrokapcsoló, amely legalább egy villamos érintkezőt tartalmaz, ahol az érintkező (2) villamosan vezető anyagú alkatrész (1) üreges szakaszaként van kialakítva, *azzal jellemezve*, hogy az érintkező (2) üreges henger alakú, és az üreges alak egy sík anyagból annak alakítása révén van kiképezve, ahol az érintkező (2) az alkatrész (1) homloktartományában elrendezett alkatrész (1) anyag feltékerése útján van kialakítva, és az érintkező (2) felületi tartományaiban (α , α') érintkezőfelületek (3) találhatóak.
2. Az 1. igénypont szerinti kapcsoló, *azzal jellemezve*, hogy az érintkezőnek (2) két érintkezőfelülete (3) van, amelyekbe egy-egy nemesfém réteg van szelektív módon bejuttatva.
3. A 2. igénypont szerinti kapcsoló, *azzal jellemezve*, hogy a nemesfém réteg csupán egy oldalon van az érintkezőfelületekre (3) feljuttatva.
4. Az előző igénypontok bármelyike szerinti kapcsoló, *azzal jellemezve*, hogy az alkatrész (1) stancolt alkatrész, amelyen az érintkező (2) egy darabból van kialakítva.

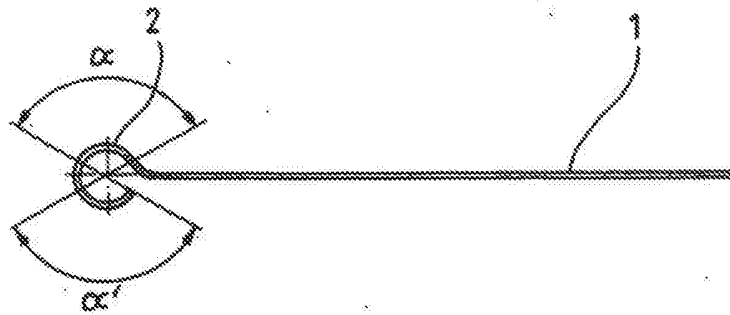


Fig. 2

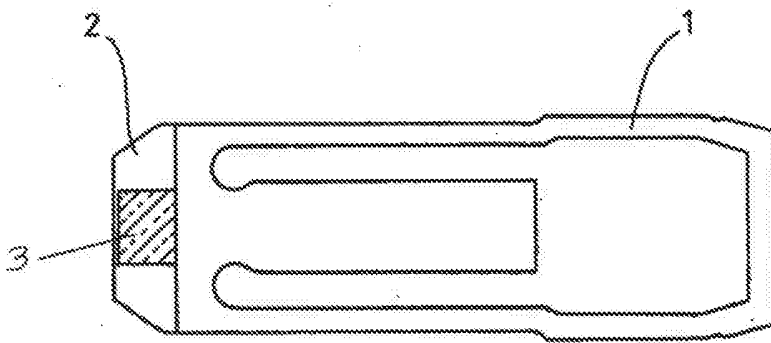


Fig. 1