

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11)

Publication number:

0 199 594
A2

(12)

EUROPEAN PATENT APPLICATION

(21)

Application number: 86303054.0

(51)

Int. Cl.⁴: H 01 H 33/66

(22)

Date of filing: 23.04.86

(30)

Priority: 24.04.85 GB 8510442

(43)

Date of publication of application:
29.10.86 Bulletin 86/44

(84)

Designated Contracting States:
CH DE FR IT LI NL

(71)

Applicant: VACUUM INTERRUPTERS LIMITED
68 Ballards Lane
Finchley London N3 2BU(GB)

(72)

Inventor: Falkingham, Leslie Thomas
25 Lullington Garth
Borehamwood Hertfordshire(GB)

(74)

Representative: Kirby, Harold Victor Albert
Central Patent Department Wembley Office The General
Electric Company, p.l.c. Hirst Research Centre East Lane
Wembley Middlesex HA9 7PP(GB)

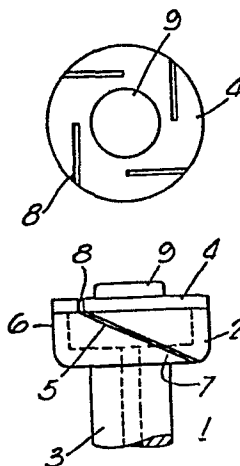
(54)

High current switch contacts.

(57)

A contact for an electrical switch, more especially a vacuum switch, having a cup-shaped body member with inclined slots in at least the side walls, and a disc having a central boss which provides the contact making surface mounted on the rim of the body member. Such a contact causes the current to move in a manner which generates both axial and transverse magnetic fields tending both to diffuse the arc and to rotate it around the contact.

Fig.1.



EP 0 199 594 A2

-1-

VI/2593 EPCHigh Current Switch Contacts

This invention relates to contacts for electrical switch devices for use in circuits designed to carry high currents and especially to contacts for vacuum interrupters and other forms of vacuum switches.

- 5 More particularly, the invention relates to such contacts which are cup-shaped and are of the kind having inclined slots in the side wall of the contact which causes the current through the contacts to produce a transverse magnetic field which forces the
- 10 arc formed between the contacts on opening or closing the switch to rotate around the rim of the contact.

In recent years it has been found that higher currents can be broken by having an axial magnetic field present. This tends to diffuse the arc and thus

15 reduce the power concentration at any particular point on the contact and thus allow higher currents to be used without undue damage to the surface of the contact.

One method of producing an axial magnetic field

20 is to provide a coil arrangement around the contacts but it must be kept fully insulated from the arcing chamber and so is fairly cumbersome.

It is, therefore, an object of the present invention to provide a contact which will force the current to move so as to generate both axial and transverse magnetic fields and will thus tend to both partially diffuse the arc and rotate it around the contact.

Accordingly, the invention provides a contact for electrical switch devices comprising a cup-shaped conducting body member having inclined slots in at least the side walls thereof and a disc of conducting material provided on top of the rim of the body member.

The disc preferably has a raised central portion and may also be slotted.

In a preferred embodiment of the invention the cup-shaped conducting body member has a plurality of slots formed therein, each slot passing through at least the part of the side walls adjacent the base in a generally helical direction and, from its junction with the base, continuing partly across the base in a chordal direction. Preferably these are between three and eight slots in the body member.

The invention will now be more fully described by way of example with reference to the drawings of which:-

Figure 1 shows in plan view and front elevation one embodiment of a contact according to the invention; and Figure 2 shows similar views of a second embodiment of a contact according to the invention.

Figures 3 and 4 show alternative embodiments of the medium.

The contact 1 shown in Figure 1 comprises a cup-shaped conducting body member 2, a stem 3 for mounting the body member 2, and a contact disc 4. The body member 2 is made of copper and has four slots 5 arranged to cut diagonally through both the walls 6 of the member 2 and its base 7. Each slot 5 is a straight cut through the member and leaves a slot in the base 7 which is in the chordal direction but which only extends across part of the base.

The disc 4, which is made of a low weld-strength material such as CLR, is provided with slots 8 which are continuations of the slots 5 in the body member 2. The slots 5 and 8 serve to rotate the arc formed on separation

of the contacts in a vacuum switch in a known manner, and this will therefore not be described further. More information may be found in our copending patent application No.2,144,916A.

- 5 The disc 4 also has a raised portion 9 which provides the area on which the arc first contacts the disc. When the arc is first formed at the centre of the disc, the current passing through the contact must travel around three sides of a "coil", that is through the base 7, the
10 walls 6 and the disc 4.

 Since this occurs around the whole contact, the current effectively goes round a toroidal shape and thus, as is well known, provides an axial magnetic field passing through the centre of the contact. As described above, such a field
15 tends to diffuse the arc and so reduce the power concentration on the contact, the arc then being rotated due to the transverse magnetic field induced by the current following the spiral paths formed by the slots in the contact.

 The contact shown in Figure 2 is similar to that of
20 Figure 1 in that it also has a conducting body member 10, a stem 11 and a contact disc 12. However, in this case, the body member 10 is provided with a larger number of slots 13 than in the above described contact, each of these slots 13 being oblique and only extending along the side
25 wall of the body member. In this case, the disc 12 is of truncated conical shape and once again is provided with slots 14 which are continuations of the slots 13.

 It will be appreciated that the contact disc need not have a raised centre portion provided the arc is first
30 formed at the centre of the contact. Furthermore, it need not be slotted and even if it is slotted, the slots need not be continuous with the slots in the body member.

 The contacts shown in Figure 3 are similar to those of Figure 1 and have their slots running in the same
35 direction.

 The contacts shown in Figure 4 are similar to those of Figure 1 and have their slots running in the same direction.

CLAIMS

1. A contact for an electrical switch device comprises a cup-shaped conducting body member (2) having inclined slots (5) in at least the side walls (6) thereof and a disc (4) of conducting material provided on top of
5 the rim of the body member.
2. A contact for an electrical switch device according to Claim 1 characterised in that the disc has a raised central portion (9).
3. A contact for an electrical switch device
10 according to Claim 1 or 2 characterised in that the disc is slotted.
4. A contact for an electrical switch device according to Claim 1 characterised in that each slot (5)
15 passes through at least the part of the side walls (6) adjacent the base (7) in a generally helical direction and, from its junction with the base, continues partly across the base in a chordal direction.
5. A contact for an electrical switch device according to any preceding claim characterised in that
20 there are between three and eight slots (5) in the body member (2).
6. A contact for an electrical switch device substantially as herein described with reference to Figure 1 of the accompanying drawing.
- 25 7. A contact for an electrical switch device substantially as herein described with reference to Figure 2 of the accompanying drawing.

Fig.1.

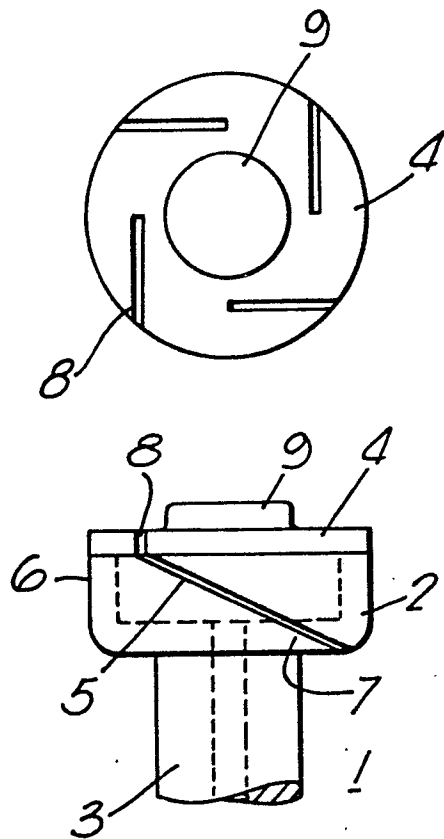


Fig.2.

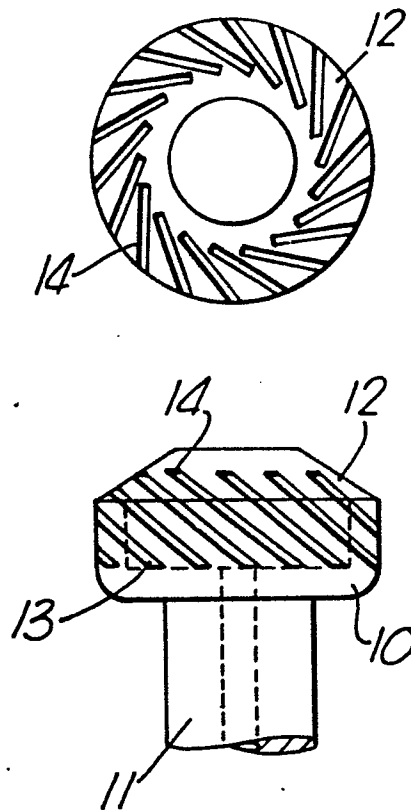


Fig.3.

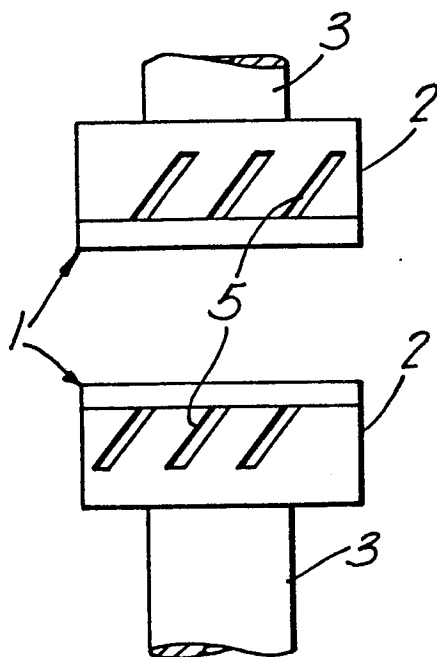


Fig.4.

