

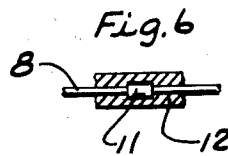
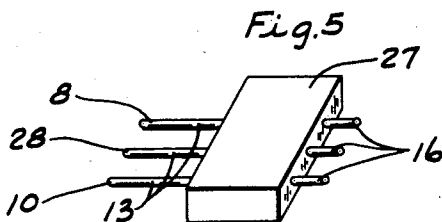
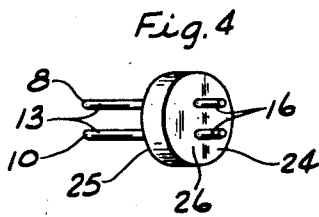
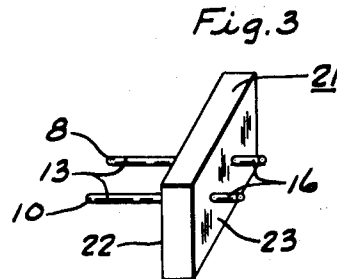
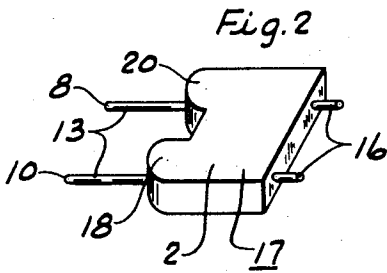
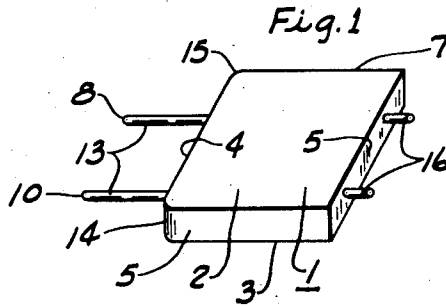
Aug. 11, 1959

R. J. COWLES

2,899,665

RESISTOR

Filed Jan. 10, 1958



INVENTOR.
ROBERT J. COWLES
BY
William D. Carothers
HIS ATTORNEY

1

2,899,665

RESISTOR

Robert J. Cowles, Ridgway, Pa., assignor to Quality Components, Incorporated, St. Marys, Pa., a corporation of Pennsylvania

Application January 10, 1958, Serial No. 708,196

10 Claims. (Cl. 338—325)

This invention relates generally to resistors and more particularly to resistors with terminals molded in one face and projecting through the same.

The principal object of this invention is the provision of a resistor of the molded type having two or more terminals extending from one face and projecting all the way through the resistor.

Another object of this invention is the provision of an uncovered molded resistor with terminals extending into one face and projecting through to the opposite face for the purpose of receiving additional circuit connections as well as for providing additional cooling for the resistor.

This invention is an improvement on the Edgar J. Knouse application, Serial No. 628,174, filed December 13, 1956, for Resistor.

Other objects and advantages of this invention appear hereinafter in the following description and claims.

The accompanying drawings show for the purpose of exemplification, without limiting the invention or claims thereto, certain practical embodiments of the invention wherein:

Fig. 1 is a view in perspective of a flat rectangular shaped resistor.

Fig. 2 is a perspective view of a rectangular shaped flat resistor having terminal projections in one face thereof.

Fig. 3 is a perspective view of a flat rectangular shaped resistor with the terminal members extending transversely through the large face of the resistor.

Fig. 4 is a perspective view of a cylindrical shaped resistor with the terminals extending through the flat end faces of the cylinder.

Fig. 5 is a perspective view of rectangular shaped resistor having three terminals extending therethrough.

Fig. 6 is a sectional view illustrating the manner in which the terminal is embedded in each of the resistors.

Referring to the drawing the resistor shown in Fig. 1 is a flat molded block of compressed resistor material uncovered and exposed on all sides and is in the general configuration of a rectangular block 1 having the large rectangular sides 2 and 3 with the four edges 4, 5, 6 and 7 that are materially smaller making the block thin. The terminals 8 and 10 are similar to the terminals as shown in Fig. 6 at 8 which is provided with an upset head 11 intermediate of its ends. The upset head 11 is completely enclosed by the molded or compressed resistance material indicated at 12. Thus each of the terminals in each of the structures shown is provided with the head as illustrated at 11. This head being molded within the resistance material so that the terminal is integral from one end to the other.

The primary connecting ends 13 of the terminals 8 and 10 in Fig. 1 pass through the flat face 4 of the compressed resistor and this face joins into the side faces 5 and 7 by the curved corners indicated at 14 and 15. This curved corner permits radiation of heat around the corner rather than off of the flat faces of the resistor and also permits the flow of heat upwardly around the resistor

2

when the latter is mounted upright. The additional connector ends 16 of the terminals 8 and 10 pass outwardly through the flat edge 5 and are exposed not only for terminal connection but also for the purpose of radiating heat as the wire terminals which are preferably made of a soft copper wire with a tin surface have a much higher heat conductivity than the molded resistance material of the resistor 1.

The resistor 17 of Fig. 2 is somewhat similarly shaped as the resistor of Fig. 1 but is provided with projections 18 and 20 adjacent the primary connecting ends 13 of the terminals 8 and 10. These projections are rounded and have the characteristic of providing more resistance material around their separate terminals without the intermediate bridging portion. The rounded portions of the projections 18 and 20 function in the same manner as the rounded corners 14 and 15 in the distribution of heat.

The rectangular resistance wafer 21 of Fig. 3 has its terminals 8 and 10 projecting through the large flat faces 22 and 23. A resistor of this character is preferably mounted as illustrated for the purpose of heat radiation.

Referring now to Fig. 4 the cylindrical disc type resistor 24 has the terminals 8 and 10 extending parallel with the axis of the cylinder and entering the face 25 and leaving the face 26. This type of resistor may be made in different lengths for the purpose of changing the resistance value. The terminals 8 and 10 are spaced an equal distance from the axis of the cylinder forming the compressed resistance material.

The structure shown in Fig. 5, the rectangularly shaped resistor 27, has three terminals 8 and 10 with an intermediate terminal 28.

These resistors have the same advantages as the resistor of the aforementioned invention but in addition thereto they provide additional cooling in the form of the continuing and projecting terminal wires as well as providing for a terminal on which other wires may be connected at opposite ends without disturbing other connections thereto. The projecting or secondary end 16 of the terminals may, of course, be as long as the primary ends 13 and they may pass up through a series of cards, on each of which a circuit is printed for the purpose of connecting a resistor to a common point to each of the cards or in a selected group of the cards containing the printed circuits.

As shown in each of the views, it is preferable to maintain the terminal wires parallel to each other. It simplifies their formation and it provides a more uniform resistance value in producing the resistance block.

I claim:

1. An electrical resistor molded in the form of a polyhedron with two major axes and having embedded in the resistor material the headed portions of bendable solid wire leads characterized in that said head portions are in direct surface contact with the resistor material and the leads lie parallel with one major axis of the polyhedron and extend from opposite sides from the head and beyond opposite sides of the polyhedron for mounting and circuit connection therewith.

2. An electrical resistor molded in the form of a polyhedron having two major axes, at least two terminal leads each having a head portion intermediate its ends, lead wires molded so as to be embedded in the resistor material with the heads lying in direct surface contact with the resistor material and the wire leads lying parallel to each other and with their ends projecting beyond the opposite sides of the polyhedron, the wire leads lying parallel to the major axis of the polyhedron.

3. An electrical resistor molded in the form of a polyhedron having two major axes, at least two terminal leads each having a head portion intermediate its ends, lead wires molded so as to be embedded in the resistor material

3

with the heads lying in direct surface contact with the resistor material and the wire leads lying parallel to each other and with their ends projecting beyond the opposite sides of the polyhedron, the wire leads lying parallel to the minor axis of the polyhedron.

4. An electrical resistor molded in the form of a cylinder having two major axes, at least two terminal leads each having a head portion intermediate its ends, lead wires molded so as to be embedded in the resistor material with the heads lying in direct surface contact with the resistor material and the wire leads lying parallel to each other and with their ends projecting beyond the opposite sides of the cylinder, the wire leads lying parallel with the axis of the cylinder.

5. An electrical resistor molded in the form of a polyhedron having two major axes, at least two terminal leads each having a head portion intermediate its ends, lead wires molded so as to be embedded in the resistor material with the heads lying in direct surface contact with the resistor material and the wire leads lying parallel to each other and with their ends projecting beyond the opposite sides of the polyhedron, the wire leads lying parallel to the minor axis of the polyhedron and rounded corners extending from the wire leads to the side of the resistor.

6. An electrical resistor comprising at least two bendable conducting metal terminal lead wires, an integral head on each lead wire intermediate its ends, an integral body of resistance material having its outer surface completely exposed to the air and completely covering the heads and adjacent portions of the lead wires to directly

4

and intimately engage the heads and wires to make electrical contact therewith, said lead wires extending parallel to each other and projecting beyond the opposite sides of the body for connection with electrical circuits from opposite sides of the resistor without injuring the resistance contact or interfering with the surface radiation of the resistor body.

7. The structure of claim 6 characterized in that said body is in the form of a polyhedron with two major axes, and that said lead wires lie parallel with one major axis of said polyhedron.

8. The structure of claim 6 characterized in that said body has one major axis, and that said lead wires lie parallel with said major axis.

9. The structure of claim 8 characterized in that said body is a cylinder.

10. The structure of claim 6 characterized in that said body has resistance material extending therefrom and around selected lead wires to extend the electrical contact therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

517,120	Lemp et al. _____	Mar. 27, 1894
1,646,535	Horton _____	Oct. 25, 1927
1,842,433	Terwilliger _____	Jan. 26, 1932
2,378,772	Hummel _____	June 19, 1945
2,438,371	Marholz _____	Mar. 23, 1948