

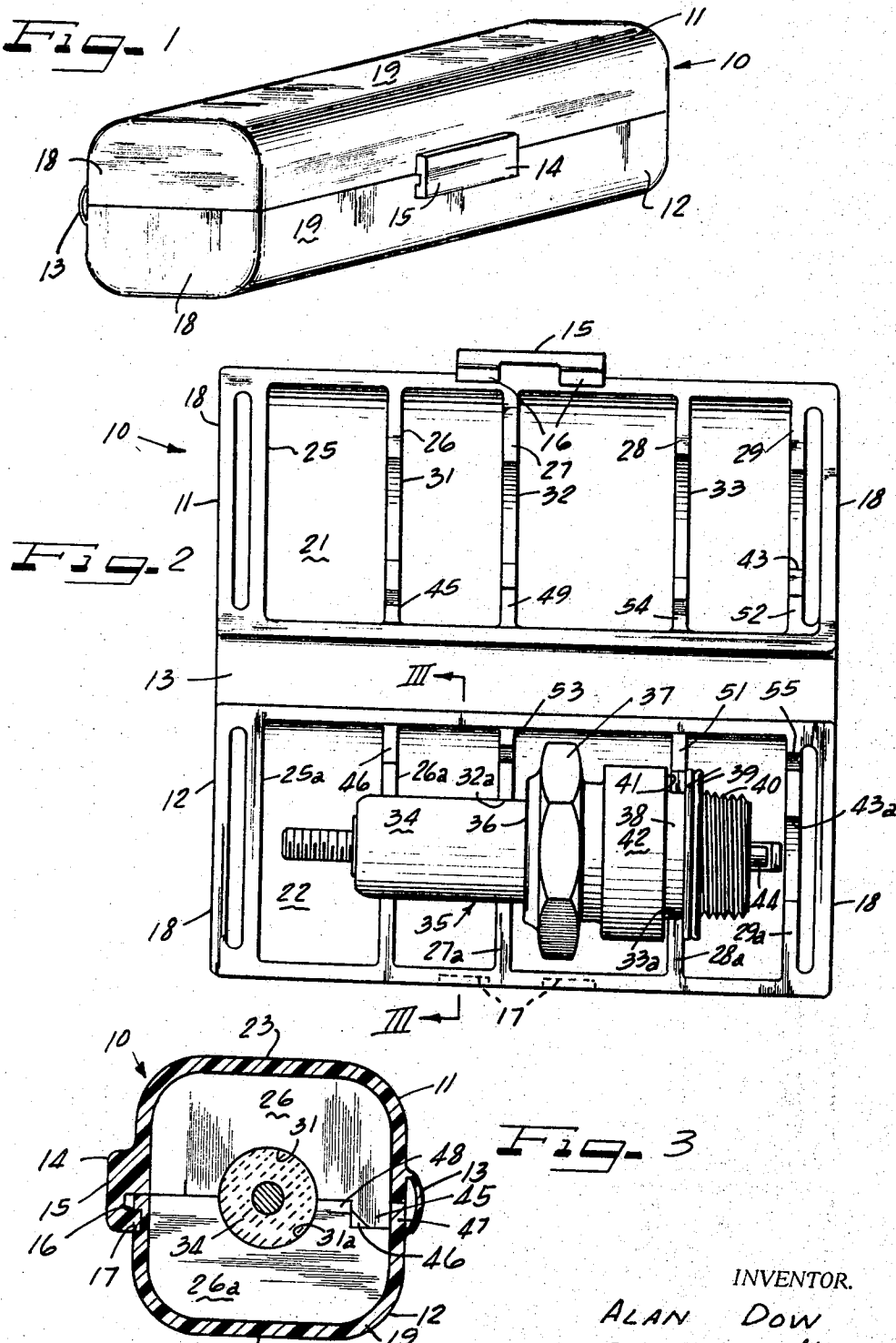
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3,429,424

SPARK PLUG CARRIER

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SPARK PLUG CARRIER

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6 Claims

ABSTRACT OF THE DISCLOSURE

A spark plug carrier consisting of two hollowed out portions joined together along one edge by an integral hinge, and having a fastening means on an opposite edge to hold the two portions in a closed position. Each of the hollowed out portions having ribs which have a recess complementary in shape to exterior portions of the spark plug. The ribs of one portion coacting with the complementary ribs in the other portion to secure the product against a longitudinal movement in the carrier and to prevent the spark plug from being damaged from impact blows received by the carrier.

BACKGROUND OF THE INVENTION

Field of the invention

This invention pertains to a container for carrying an elongated article such as a spark plug.

Prior art

Containers for carrying spark plugs and other fragile elongated articles which consist of a cup-shaped member in which the article is inserted and a closure cap or second cup-shaped member are known in the prior art and are exemplified by the patents to Roehrl, U.S. Patent No. 2,690,947, and Houser, U.S. Patent 2,718,298.

Another type of container known in the prior art consists of a block-like member of a resilient material such as rubber having a cavity complementary to the shape of the article which may be a spark plug and a slot extending from one end of the block to allow the insertion or removal of the article from the cavity. A carrier of this type is disclosed and described in the British Patent No. 225,154 to Beru A.G.

Both of the above type of spark plug containers will provide some protection for the spark plug from damage due to dropping of the container and will prevent damage to the fragile parts of the spark plug.

SUMMARY OF THE INVENTION

The present invention provides a spark plug container which is inexpensively manufactured by being molded in a single piece and which will prevent damage to the spark plug carried therein.

The container of the present invention prevents damage to the article carried therein by providing pairs of coacting ribs which grip the article and insulate it from the shock that is received by the container. The rigidity of the container is further increased by providing a series of projections and recesses which coact when the container is in the closed position to prevent lateral movement between the container portions. Thus, it is an object of the present invention to provide a container for protecting spark plugs while being transported and stored.

Another object of the present invention is to provide a spark plug container which is molded in one integral piece and has internal ribs which support the spark plug and prevent damage thereto from impact blows received by the container.

A still further object of the present invention is to provide a spark plug carrier or container which is molded from a single piece and has integral means which prevent

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the portions of the container from moving with respect to each other while held in the closed position.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheet of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

The drawings:

FIG. 1 is a perspective view of the spark plug carrier of the present invention in a closed position;

FIG. 2 is a plan view of the spark plug carrier of the present invention in an open position having a spark plug disposed in one half thereof; and

FIG. 3 is a section of the closed spark plug carrier taken along line III-III of FIG. 2.

As shown on the drawings:

The principles of the present invention are particularly useful when incorporated in a spark plug carrier or container generally indicated at 10 which include a pair of container members or portions 11, 12 which are connected along one edge by an integral hinge member 13 and have a latching means 14 on an edge opposite the hinge member 13. The carrier or container 10 is preferably made in one piece by molding plastic material preferably polypropylene resin of a type which has a high impact at low temperatures and is not brittle at temperatures in the range down to -20° F. Polypropylene resins are selected over other plastics because of the excellent characteristic for a "living hinge" application for holding two members such as the container members 11 and 12 together.

The latching means 14 consist of tab 15 extending from the container member 11 and having a pair of projections 16 which are received in a pair of complementary recesses 17 that are formed adjacent to the edge in the container member 12.

The container members 11 and 12 each have a pair of end walls 18, 18 interconnected by a wall 19 which extends between the two end walls and forms a trough-like cavity 21 in the member 11 and a trough-like cavity 22 in the member 12. As best shown in FIG. 1, the container 10 has a cross section which is substantially square with rounded corners and provides each of the members 11 and 12 with a flat portion 23 and 24, respectively. The flat portions 23, 24 provide a space for forming indicia on the container either during the molding operation or subsequent thereto by a hot stamping operation.

Each of the container portions 11 and 12 are provided with five ribs or partitions 25, 26, 27, 28, and 29, the ribs of the portion 12 being 25a through 29a. Each of the ribs 25 through 29 of the member 11 are in alignment with their corresponding rib 25a through 29a in the member 12 to form pairs of ribs laying on a plane substantially perpendicular to the longitudinal axis of the container 10. The ribs 25 and 29 are disposed adjacent the end walls 18, 18 as best illustrated in FIG. 2, to increase the strength of the end walls 18 and to provide further support therefor. The ribs 26, 27, and 28 are spaced inwardly from the end walls and the spacing between these ribs is determined by the article to be carried in the container and will be discussed hereinafter.

The ribs 26, 27 and 28 each have a recess 31, 32 and 33 respectively which coact with a complementary recess in the ribs 26a through 28a to provide an article receiving and gripping means. As best shown in FIG. 3, the recess 31 of the rib 26 coacts with the recess 31a of the rib 26a to grip the ceramic portion 34 of the spark plug 35. The recesses 31, 31a are complementary to the outer surface of the ceramic portion 34 and prevent movement of the

portion 34 when the container portions 11 and 12 are in the closed position and held by the latching means 14.

The recesses 32 and 32a as shown are substantially the same size and dimensions as the recesses 31 and 31a; however, these recesses may be of a different diameter depending upon the shape and size of the ceramic portion 34. For example, if the ceramic portion 34 is tapered with an enlarged portion adjacent an end 36 of the metal base 37 of the plug 35, the recess 32 and 32a will have a larger diameter than the diameter of the recesses 31 and 31a.

The recesses 33 and 33a, as shown in FIG. 2, have a larger dimension than the above mentioned recesses and coact to engage a smooth portion 38 of the metal base 37 of the plug 35. Preferably the washers 39 are abutted against the threads 40 of the plug 35, and the recesses 33 and 33a engage the portion 37 so that the portions of the ribs forming the edges defining the recesses 33, 33a are in contact with the washers 38 and a shoulder 41 of an enlarged portion 42 of the base 36. The engagement of the ribs between the shoulder 41 and the washers 39 prevents the spark plug 35 from longitudinal movement while gripped in the recesses of the ribs of the container.

The spacing between ribs 27 and 28 is selected to provide space for a portion of the metal base 37 which extends between the shoulder 41 and an end 36 of the base 37. As illustrated, the spacing is greater than the dimension between the end 36 and shoulder 41 to allow the carrier 10 to be used with a plug having a greater dimension for the portion of the base extending between the shoulder 41 and end 36. The spacing between ribs 26 and 27 is selected so that both ribs engage the ceramic portion 34.

The ribs 29, 29a are provided with the recesses 43 and 43a respectively to provide an opening to prevent the contact of the electrodes 44 by the rib 29 if the container containing the spark plug is either dropped on its end or receives a blow adjacent the rib 29. Furthermore, the recess 43 and 43a allows for the insertion of a plug which may have an electrode that extends further from the shoulder 41 and requires additional space.

The containers portions 11 and 12 are provided with an engagement means which prevents the movement of the container portions 11 and 12 while in the closed position in a direction perpendicular to the longitudinal axis of the container 10. As best illustrated in FIG. 3 the engagement means comprises a projection 45 on the rib 26 which is received in a second or additional recess 46 in the rib 26a. The projection 46 abuts against an edge portion 47 of the wall 19 of the member 12 adjacent to the hinge 13 and an engagement surface of a portion 48 of the rib 26a which prevents movement of the two container portions 11 and 12 in a direction along the plane formed by the mating edges of the container portions 11 and 12. The ribs 27, 28a and 29 are provided with similar second or additional recesses 49, 51 and 52 respectively and the ribs 27a, 28 and 29a are provided with projections 53, 54 and 55 respectively. The recesses 49, 51 and 52 are substantially similar to the recess 46 and the projections 53, 54 and 55 and are similar in structure to the projection 45. As shown in FIG. 2, the ribs 26 through 29 of the container portion 11 alternately have projections and recesses, therefore if a rib of one of the members 11 or 12 has a projection the adjacent ribs of the one member have recesses. As illustrated, the ribs 25 and 25a are not provided with the projections and recesses; however, they may have the projections and recesses if desired.

As shown in the figures, an article, such as a spark plug 35, is gripped in the recesses of the coating pair of ribs when the container is closed, and the article is held in a position which prevents damage thereto should the container be dropped or jolted. Due to the protection afforded by the container 10 for an article such as a spark plug 35, the carrier or container is ideal for storing a spare spark plug which is carried as a spare part in a ve-

hicle such as a snow-mobile or other motor vehicles in which the spare parts are subjected to bumps and jolts.

By molding the container 10 as a single unit out of polypropylene resin, the container parts 11 and 12 may be integrally joined together by the hinge member 13, and by selecting a type of polypropylene resin which displays a high impact at low temperatures, the molded container 10 will have the toughness that is required for use in an environment in which the temperatures are below 0° F. If the container is to be used in an environment which does not have low temperatures, other types of polypropylene resins may be used; however, a majority of the polypropylene resins display a brittle characteristic at low temperatures. Therefore, it is desirable that the container be molded from a resin which at temperature below 0° F. displays high impact and toughness characteristics.

I claim as my invention:

1. In a container for storing and transporting a fragile elongated article, such as a spark plug, the container comprising a pair of container portions each having a wall defining a cavity, said portions being interconnected along one edge by an integral hinge member, and said portions having latching means disposed at an edge opposite the hinge member for holding the portions in a closed position; the improvement comprising the cavity of each of the container portions having at least two integral ribs extending across the cavity and being spaced from each other along an axis of the portion, the ribs of one portion being aligned with the ribs of the other portion to form at least two pairs of coating ribs, each pair of coating ribs having an article receiving and gripping means defined by a recess in said ribs of said pair, said recesses being complementary to a portion of the article to be received in said recesses, said article receiving and gripping means holding the article to prevent movement of the article and to prevent damage to the article when the container portions are in the closed position.

2. In a container according to claim 1, wherein the recesses of one of said pairs of coating ribs have a different dimension than the dimensions of the other recesses, so that an article having different cross-sectional dimensions complementary to said recesses is firmly gripped by said spaced receiving and gripping means.

3. In a container according to claim 1, wherein said pairs of coating ribs are in substantially parallel planes.

4. In a container according to claim 1, the improvement further including engagement means disposed on the portions for preventing relative movement therebetween in a lateral direction to said one edge, said engagement means including a projection on each of said portions having a length so that it extends into the cavity of the other portion to engage a wall surface of the other portion when the portions are in the closed position.

5. In a container according to claim 4, wherein said projections are a projection on one rib of each pair of coating ribs.

6. In a container according to claim 5, wherein said projections are disposed adjacent said one edge of said portions and wherein said engagement means includes an additional recess in the other rib of said pairs of coating ribs to provide an engagement surface on said other rib for coating with said projection.

References Cited

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