Jan. 24, 1961 R. J. SWIFT ET AL 2,968,986

METHOD OF FABRICATION OF EXPLOSIVE MISSILES

Filed Jan. 30, 1957

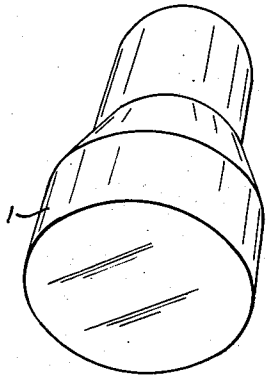


Fig-1

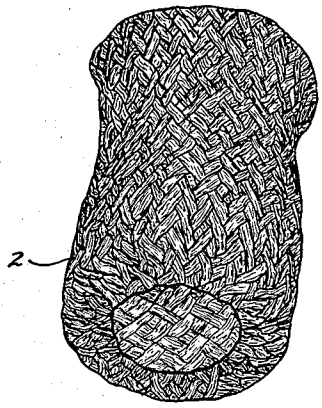


Fig-2

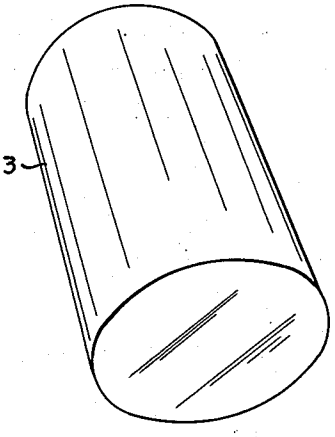


Fig-3

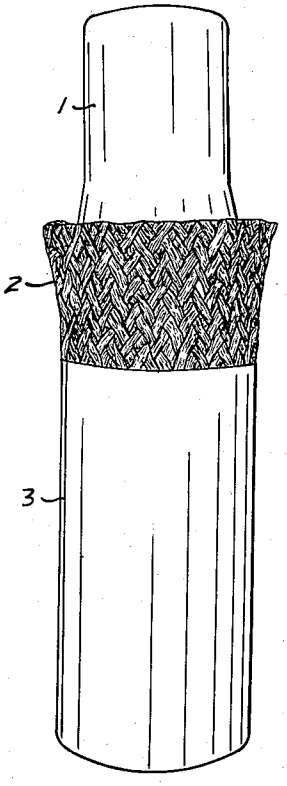


Fig-4

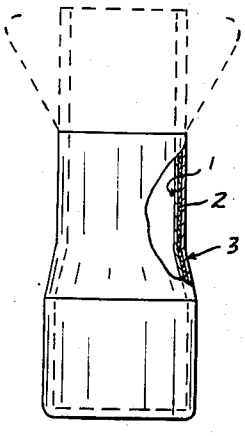


Fig-5

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United States Patent Office 2,968,986 Patented Jan. 24, 1961

2,968,986

METHOD OF FABRICATION OF EXPLOSIVE MISSILES

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Filed Jan. 30, 1957, Ser. No. 637,339

1 Claim. (Cl. 86—20)

This invention relates to containers and shells, and more particularly to ordnance shells having means for increasing the spalling or squash on armor.

An object of the invention is the method of making high explosive containers or shells for withstanding strains and stresses vastly in excess of ordinary containers whose deformations are controlled by the yield stress of the wall material.

A further object is the provision of a triple walled high explosive shell utilizing a straining wall to permit lateral deformation and squash effect upon contact with armor before splitting.

A further object is the provision of an impervious high explosive shell or container surrounded by a second shell or container constructed to permit a predetermined material lateral expansion or increase in diameter of the shell upon impact of the forward end thereof with an obstruction, such as armor, to increase the spalling effect.

A further object of the invention is the provision and method of making an explosive shell which comprises utilizing an impervious thin wall inner shell and surrounding the inner shell by a loosely braided intermediate inclosure or container of interwoven metallic strands with the strands disposed on a bias to the longitudinal axis of the inner shell to function as a laterally yieldable restraining container which permits a material increase in diameter and for shortening thereof upon contact of its forward end with an obstruction, such as armor.

A further object and method is the provision of an outer thin metallic shell spun over the intermediate braided shell or container to force the outer and inner surfaces of the intermediate braided shell into intimate contact respectively with the inner and outer surfaces of the outer and inner shells.

Other objects and advantages of the invention will become apparent from the following description and accompanying drawings in which like reference characters refer to like parts in the several figures of the drawings.

Figure 1 is a perspective view of one form of inner shell or body.

Figure 2 is a perspective view of the intermediate braided shell or body, before assembling over the inner shell.

Figure 3 is a perspective view of the outer shell or body before assembling over the braided intermediate braided and inner shells.

Figure 4 is a side elevation of the shells and braided container in the process of being assembled.

Figure 5 is a side elevation of the shells in assembled relation with the outer shell spun or rolled on the inner shell and braided container to bring the inner and outer shells into intimate contact with the braided bias woven intermediate shell.

In the drawings the reference numerals 1, 2 and 3 denote respectively the inner shell or container, the intermediate braided shell or container, and the outer shell or container.

The inner container or shell 1 is preferably a thin wall

shell or war head open at its rear end to receive a high explosive powder charge and closed at its forward end to provide an impervious container. The shape of the inner shell to a great extent governs the shape of the finished shell or war head and can be used to convert all type of missile war heads into high explosive plastic armament that can utilize the spalling principle to defeat armor. The inner shell may be made of thin wall spun metallic material such as aluminum and adapted to split.

The intermediate container or shell 2 is composed of a fairly loosely braided tubular body having warp and woof strands disposed on a 45° bias to its longitudinal axis. It is a cylinder of braided wire (somewhat similar to the shielding used on electrical cables) but preferably stronger and heavier and preferably is compressed at right angles to its circular cross section and is slipped or forced over the preformed inner shell 1.

This comprises a geodetic liner of braided wire which is utilized as a straining wall since this material exhibits the property of substantially stress-free deformation. Thus if the intermediate container 2 of braided wire is compressed longitudinally by contact at its front end with an obstruction, such as armor, a material increase in diameter (and a decrease in length) will result before rupture, even though the inner and outer thin containers split longitudinally.

The extent of the deformation depends, naturally, on the orientation of one braided strand to the other and the tightness of the woven material before and after compression. As shown, the braided container has the strands thereof disposed on a substantially 45° bias to the longitudinal dimension or axis of the container as shown in Figure 2. The outer container 3 is preferably also a thin wall spun aluminum shell which may split longitudinally after extreme deformation of the braided intermediate container 2. As shown in the drawing the outer container is telescoped over the inner shell 1 and the braided container 2 with a snug sliding fit requiring some force, to seat the forward end of the outer container on the forward end of the braided container 2.

After the outer shell 3 has been forced "home" over the inner shell 1 and intermediate braided container 2 the outer shell 3 is preferably rolled or spun down tight on the braided container 2 to force the inner and outer surfaces respectively of the braided container 2 into intimate contact with the outer and inner surface of the inner and outer containers 1 and 3.

The shape of the final shell or container is somewhat optional, depending upon the use to which it is employed, it may be more streamlined in connection with high explosive ordinance shells than with bombs and some types of missiles. Of course the initial shape of the preformed inner thin metallic shell 1 determines substantially the final shape of the finished outer shell. In the method of making the high explosive shells of the subject invention which have a high yieldable lateral deformation characteristic the inner shell or liner is first spun out of thin material such as aluminum to form a high explosive container or war head of the desired shape.

A braided container composed of wire strands woven to dispose the strands on a bias to its longitudinal axis is now slipped over the inner container 1 so as to inclose the inner container within the braided metallic cylindrical container.

The thin metallic cylindrical container 3 preferably of thin guage aluminum is next fabricated so as to slip snugly over the exterior of the braided container or cylinder 2.

The outer shell 3 is now spun or rolled down toward the inner shell 1 to force the inner braided surface into intimate contact with the outer surface of the inner shell

1 and simultaneously force the inner surface of the outer shell into intimate contact with the outer surface of the braided container 2.

The inner shell may now be loaded with a high explosive and its rear end closed. Upon projection thereof and the forward end striking an obstruction such as armor or a tank the braided bias woven wire cylindrical container will allow the shell to materially expand in diameter before bursting and thus materially increase the spalling effect on armor. Convention detonation means, not shown, for the explosive charge may be employed.

The above description and accompanying drawings are for exemplary, rather than restrictive purposes, and therefore it is evident that those skilled in the art, may vary the details of construction as well as the arrangement of parts without departing from the spirit of the invention and therefore we do not wish to be limited to the above disclosure, except as may be required by the claims.

We claim:

The method of explosive missile fabrication to increase the spalling effect of the missile on armor comprising, inclosing an inner thin walled elongated cylindrical receptacle adapted to contain an explosive with a loosely braided elongated wire stranded cylindrical intermediate container with the wire braided strands disposed on a bias to the longitudinal axis of the inner receptacle and said intermediate container compressed laterally into encircling contact with the outer surface of the inner receptacle, inclosing said intermediate bias braided wire container with a closely fitting outer thin walled elongated metal receptacle, and spinning said outer receptacle over the length of said intermediate bias woven metallic receptacle to force the inner surface of the intermediate braided wire container into intimate contact with the outer surface of the inner receptacle throughout substantially the length thereof and loading the inner receptacle with an explosive, whereby when the missile is projected against armor the bias woven sleeve will be expanded transverse to its longitudinal axis to cause splitting of the thin walled outer receptacle and increase the spalling effect on the armor.

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