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MISSILE PLASTIC CONTAINER

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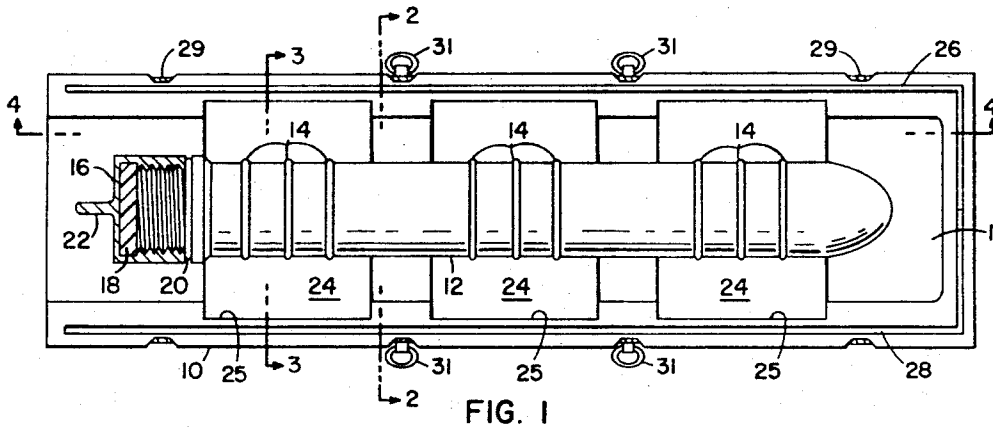


FIG. 1

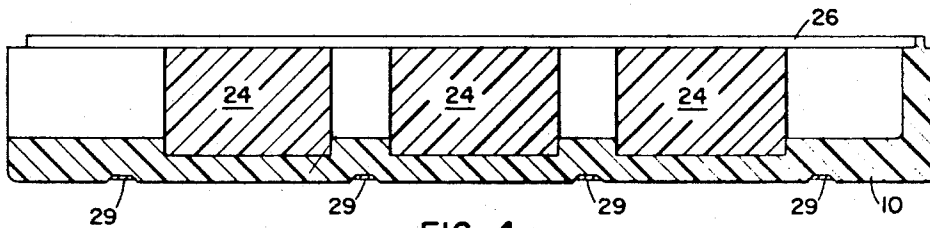


FIG. 4

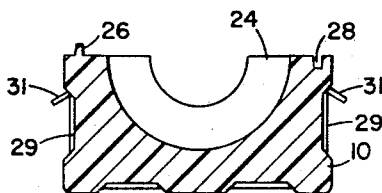


FIG. 2

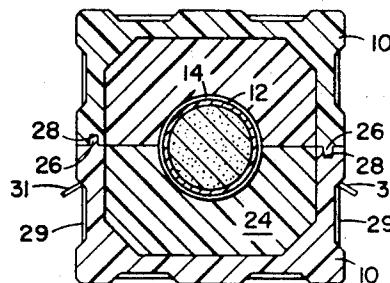


FIG. 3

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MISSILE PLASTIC CONTAINER

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9 Claims

ABSTRACT OF THE DISCLOSURE

An improved transportation and storage container for a missile or projectile, made entirely of closed-cell plastic material and including two identical outer halves adapted to be supported by banding when meshed together, a sealable inner container, and a suspension media for supporting the inner container. The breech end of the inner container extends out into a hollow portion between the two outer halves and is adapted for receiving an air and moisture proof closure cap.

DEDICATORY CLAUSE

The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

BACKGROUND OF THE INVENTION

This invention is in the field of missile and projectile containers. The previous containers utilized exterior strapping and fastener hardware with the missile or projectile being rigidly displaced inside the container, or if a suspension system was used, the system used shock mitigating devices such as rubber shock mounts, shock absorbers and springs.

SUMMARY OF THE INVENTION

This invention is an improved transportation and storage container for a missile or projectile having a sealable inner container, a suspension media and an outer structure with banding equipment for D rings. The suspension media is made of a foam plastic material of low density that is more economical than the suspension system utilized in existing containers. The suspension media is a series of polyethylene foam plastic saddles surrounding the inner container at regular dimensioned intervals. This invention differs from other containers because it is not necessary to utilize fastener devices. The outer structure case comprises two identical open sections made of medium density polystyrene foam plastic material such that when the two sections are mated, raised ribs and recesses combine to mesh the two outer structure cases together. A threaded removable closure cap fastens on exterior threads at the breech end of the inner container and seals against an O ring. The inner container is made of high density plastic such as linear polyethylene material and is impervious to moisture. This invention provides a new packaging technique that will be applicable to small and medium-style missiles and any other small units that have the same packaging requirements.

An object of this invention is to provide a new container which will permit access to the missile contained in the inner container without removal of exterior strapping and fastener hardware.

Another object of this invention is to provide a new and improved container capable of protecting a delicate object contained therein from severe shock and vibration during handling, transportation, and field replenishment phases.

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Another object of this invention is to provide a new container which will prevent the inner container O ring seal from sustaining shock forces each time the container is dropped or receives rough handling.

Another object of this invention is to provide a new high-strength, low-weight, low-cost container which will provide physical and mechanical protection during worldwide distribution.

Another object of this invention is to provide a new container comprised of only eight major components, thereby reducing the inventory of container components in the military supply system.

Another object of this invention is to provide an expendable container which offers the military a secondary usage through flotation capabilities inherent in the container materials and design.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a longitudinal view, partly in section, looking at the inner container tube portion and one of two missile outer structure cases, and showing the closure cap in section that closes over the breech end of the inner container tube,

FIGURE 2 is a sectional view taken along line 2—2 of FIGURE 1,

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1 with the other half of the missile container included, and

FIGURE 4 is a sectional view along line 4—4 of FIGURE 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGURE 1 illustrates one of two identical outer structure cases 10 of the missile container, along with an inner container 12, which holds the missile. Each outer structure case 10 has a cavity 11 with recesses 25 therein. A threaded removable closure cap 16 is shown in section, threaded on the exterior surface of the missile-breech end of inner container 12 for holding the missile in the container. Precompressed polyethylene packing 18, on the inside of closure cap 16, holds the missile firmly within the inner container 12 when the closure cap is threaded securely on the inner container. A silicone O ring 20 fits in a groove of inner container 12 and, when secured in place by removable closure cap 16, prevents the entry of water into the inner container. An embossed handle 22 on the outer part of removable closure cap 16 aids in securing or removing the closure cap on the inner container 12. By using the embossed handle 22, the process of opening closure cap 16 from the inner container 12, removing a missile, reinserting a missile and closing the container is done in a maximum period of 45 seconds.

A suspension media consists of a series of low density polyethylene foam plastic saddles 24, that are seated in recesses 25, surround inner container 12 at dimensioned intervals. Integral polyethylene collars 14, projecting around the periphery of inner container 12, that is made of linear polyethylene, are embedded in suspension media saddles 24 to allow inner container 12 to move, as required, when the package sustains vibration excitation and shock impacts. The suspension media is designed to mitigate shock forces and vibration within limitations imposed by the missile design. The two outer structure cases 10 are composed of medium density polystyrene foam plastic which encapsulates the suspension media and the inner container 12. Banding 29, applied girthwise around the

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two outer structure cases reinforces the outer structure. D rings 31, attached to the banding, facilitates personnel handling or tie-down points for transportation.

FIGURES 2, 3 and 4 represent sections taken along lines 2—2, 3—3 and 4—4 respectively in FIGURE 1. FIGURE 2 illustrates a traverse section of the missile plastic container showing only one-half of outer structure case 10 with one side having raised rib 26 and the other side having a recess 28 for locking with another identical outer structure case 10. FIGURE 3 illustrates a traverse section of the missile plastic container showing both outer structure cases 10 with raised and recess references 26 and 28 mated to each other. The two outer structure cases encircle expanded polyethylene foam saddle section 24, which in turn encircles inner container 12 for holding the missile. FIGURE 4 illustrates a longitudinal section along line 4—4 of FIGURE 1 and shows the spacing of expanded polyethylene foam saddle sections 24 located inside outer structure case 10.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings.

We claim:

1. A container for a missile or projectile comprising: a pair of longitudinally extended outer structure half cases; a generally cylindrical inner container including an externally threaded section at the breech end and external circular ribbed sections traversing said inner container at regular intervals; a removable closure cap having an internal threaded section that meshes with said externally threaded section of said inner container; a plurality of saddle sections, said saddle sections being generally rectangular in shape and having a semicircular opening on one side that accommodates said inner container ribbed sections, said plurality of saddle sections being rigidly enclosed by said pair of outer structure half cases, said removable closure cap being adapted for rigidly holding a missile inside said inner container whereby any shock or vibration of said outer structure will be absorbed where said ribbed sections of said inner container and said saddle sections fit together.

2. A container for a missile or projectile as set forth in claim 1 wherein said pair of outer structure half cases are made of a medium density plastic.

3. A container for a missile or projectile as set forth in claim 2 wherein each of said pair of outer structure half cases has a raised reference about one-half of said case and a recessed reference on the other half of said case

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whereby said raised reference of one of said pair meshes with the recessed reference of the other of said pair to enable one to apply an adhesive to connecting surfaces of said pair of outer structure half cases to further enhance a stable connection.

4. A container for a missile or projectile as set forth in claim 3 wherein said saddle sections are made of low density foam plastic.

5. A container for a missile or projectile as set forth in claim 4 wherein said inner container is made of high density plastic.

6. A container for a missile or projectile as set forth in claim 5 wherein said removable closure cap has an embossed handle on the outer face to facilitate easy closing and removal.

7. A container for a missile or projectile as set forth in claim 6 wherein said removable closure cap has precompressed polyethylene packing on an inner face.

8. A container for a missile or projectile as set forth in claim 7 wherein said inner container has an O ring located inward from externally threaded section at the breech end and locked in a circular recess around the external portion of said inner container whereby said removable closure cap fits snugly against said O ring of said inner container when said closure cap and said inner container are fully meshed.

9. A container for a missile or projectile as set forth in claim 8 wherein said two outer structure half cases have indentations around their outer periphery for supporting strapping and D rings whereby said D rings are used as handles and tie-down points.

References Cited

UNITED STATES PATENTS

1,983,322	12/1934	Stewart	206—46
2,933,183	4/1960	Koelsch	206—46
3,166,978	1/1965	Price et al.	206—46 X
3,072,022	1/1963	Wood et al.	206—3 X
3,346,137	10/1967	Ricci	206—46 X

FOREIGN PATENTS

1,058,507 3/1954 France.

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206—46; 220—9