United States Patent [19]

Slysh et al.

[11] **3,713,560**

[45] **Jan. 30, 1973**

[54] SPACED WALL CONTAINER

[75] Inventors: **Paul Slysh**, San Diego; **Edward J. Hujsak**, La Jolla, both of Calif.

[73] Assignee: **General Dynamics Corporation**, San Diego, Calif.

[22] Filed: **April 19, 1971**

[21] Appl. No.: **134,994**

[52] **U.S. Cl.** .....**220/15**, 220/9 LG, 220/10

[51] **Int. Cl.** **B65d 25/04**

[58] **Field of Search** ....220/9 A, 9 LG, 10, 15; 62/45, 62/55; 114/74 A

[56] **References Cited**

UNITED STATES PATENTS

3,245,571	4/1966	Canty et al.	220/15
3,331,525	7/1967	Coehn	220/15
3,004,683	10/1961	Buchhold et al.	220/15
3,102,655	9/1963	Adkins et al.	220/15
3,207,353	9/1965	Canty et al.	220/15
3,409,061	11/1968	Struble, Jr.	220/15 X

OTHER PUBLICATIONS

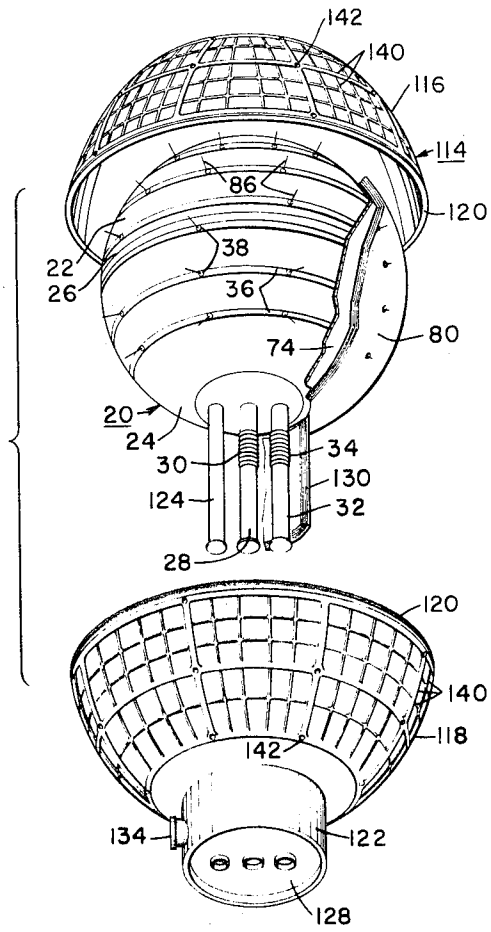
Industrial Packaging, "A Story of Navy Packaging" pages 51–53, August 15, 1956.

Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—Michael Mar
Attorney—John R. Duncan

[57] **ABSTRACT**

A spaced wall container having an inner wall for containment of fuels, cryogenic liquids, and the like spaced from, and connected to, an outer structure by a plurality of tension members to create steady-state stabilizing forces on the outer structure by utilization of the radial and tangential stiffness of the pressurized inner wall. The tension members are spring-biased to ensure tension loading under all conditions. Insulation material is mounted on the tension members between the inner wall and outer structure. Protection against fluid leakage into the insulation material is afforded by a shield interposed between the inner wall and the insulation. The outer structure forms a protective enclosure for the inner wall container in addition to forming the external wall of a Dewar flask when the void between the spaced walls is evacuated.

10 Claims, 7 Drawing Figures

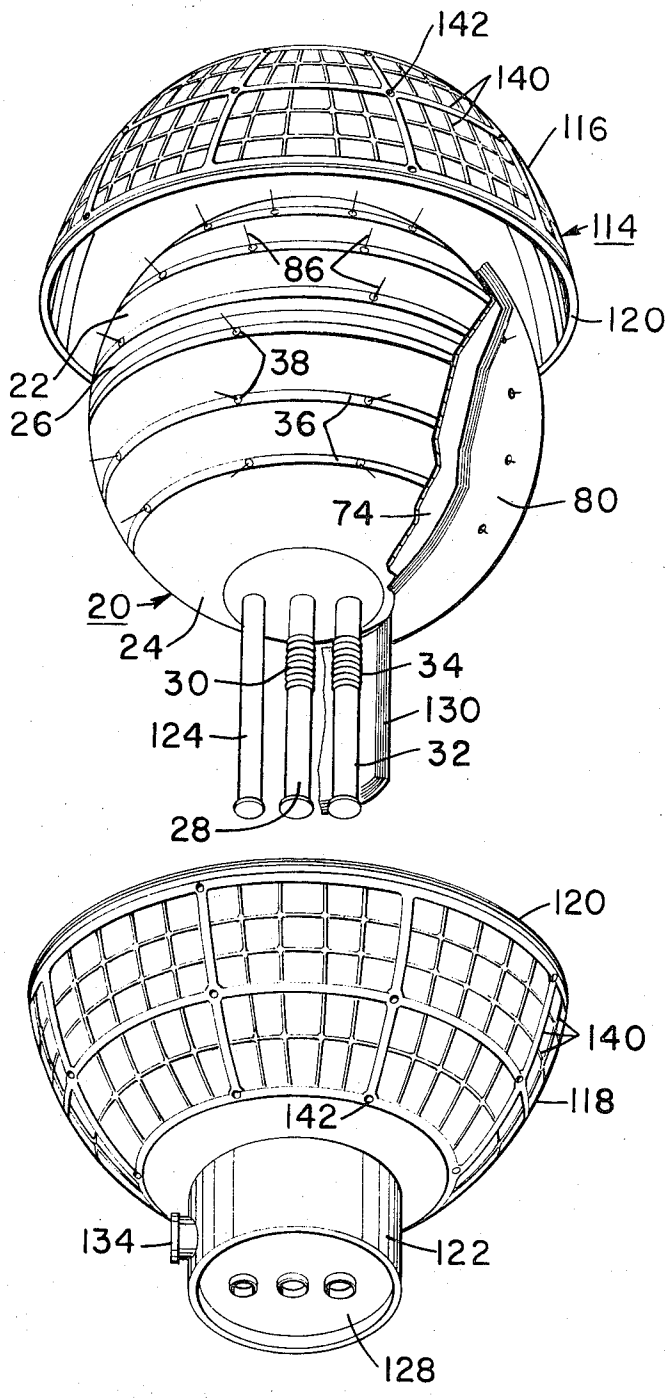


PATENTED JAN 30 1973

3,713,560

SHEET 1 OF 3

FIG. 1



INVENTORS
PAUL SLYSH &
BY EDWARD J. HUJSAK
John P. Brennan
ATTORNEY

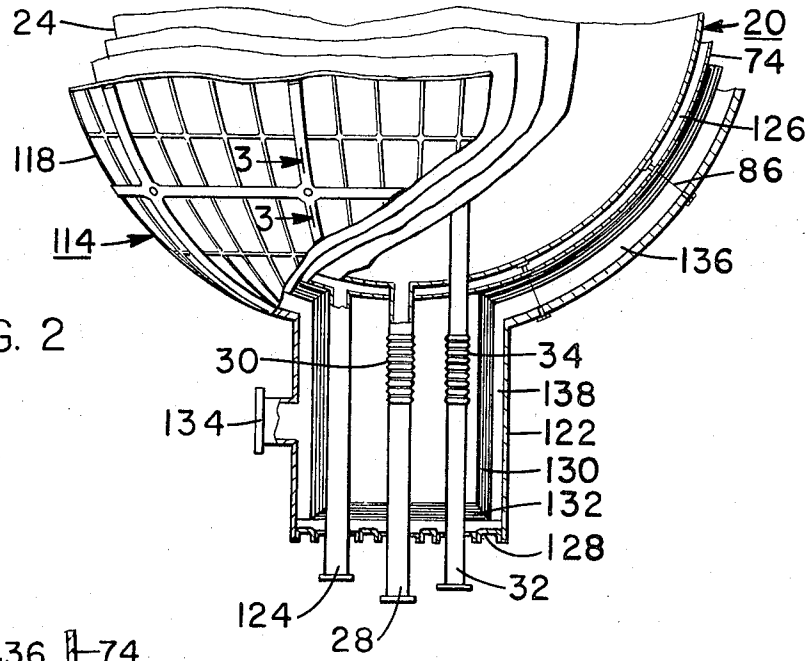


FIG. 2

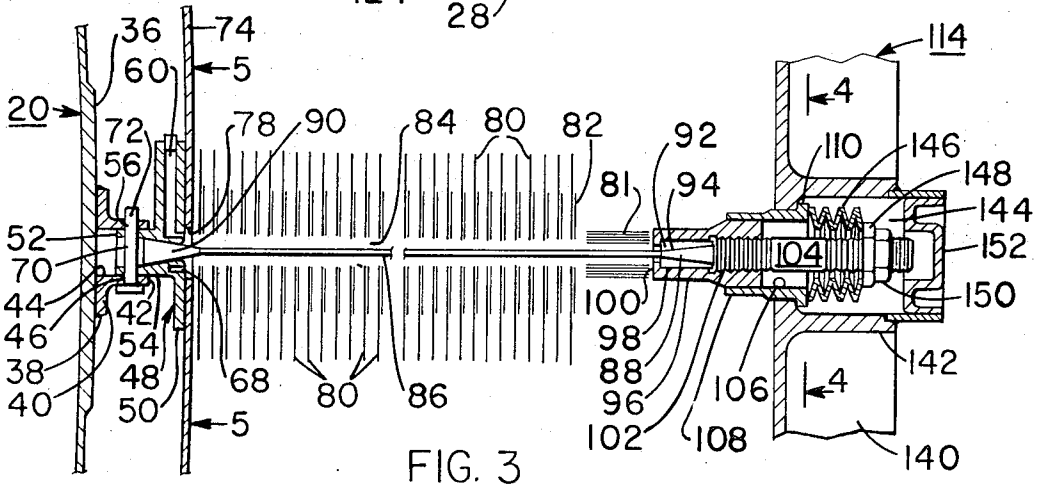


FIG. 3

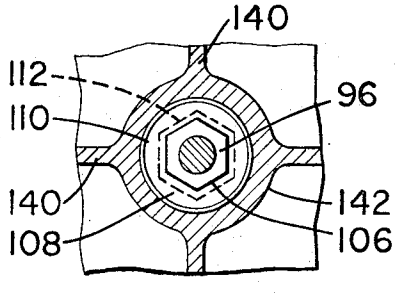


FIG. 4

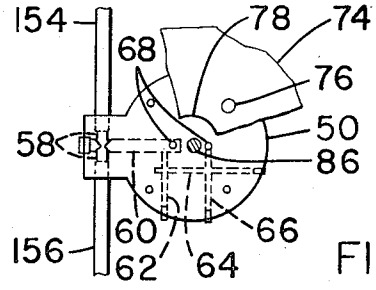


FIG. 5

INVENTORS
PAUL SLYSH &
EDWARD J. HUJSAK
BY
John R Duncan
ATTORNEY

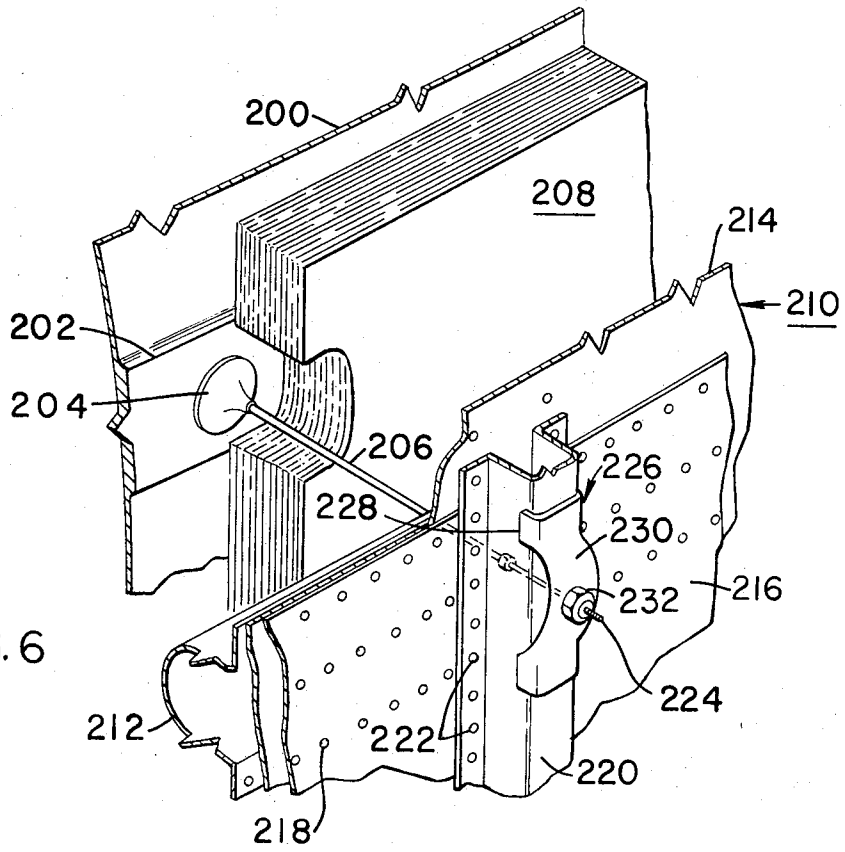


FIG. 6

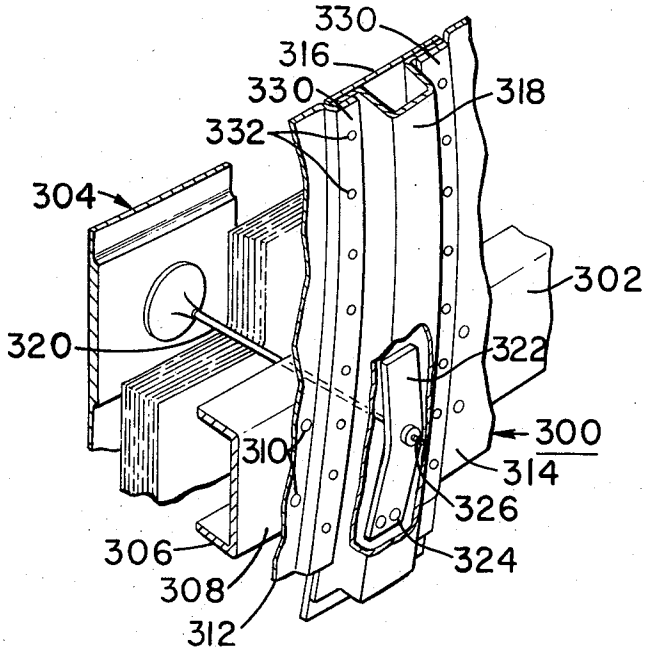


FIG. 7

INVENTORS
PAUL SLYSH &
EDWARD J. HUJSAK
BY
ATTORNEY

SPACED WALL CONTAINER

BACKGROUND OF THE INVENTION

Evacuated, spaced wall containers for containment of cryogenic liquids are known to be one of the most effective and efficient means to prevent external heat from leaking into the inner tank or container. This type of container usually takes the form of a double-walled enclosure, or two concentric shells, having the space between the shells evacuated in the manner of a Dewar flask. The well-known "Thermos" bottle is a typical example of such a container. The Dewar flask may have the inner surface of the outer wall and the outer surface of the inner wall silvered to further enhance its insulating capability by reflecting heat back in the direction of origin. Thus, the Dewar vessel is effective in retarding radiation heat transfer by the reflective coating on the inner walls thereof while convection heat transfer is minimized by evacuation of the annulus between the spaced walls. Conduction heat transfer is reduced to a minimum in such vessels by isolating the inner container from the outer enclosure as much as possible and reducing the support or attachment fittings connecting the two together to a minimum size and quantity.

While this type of construction leads itself admirably to the manufacture of insulated containers of small proportions, it is not readily adaptable to large-sized cryogenic fuel tanks due primarily to weight restrictions in addition to other considerations. For example, in order to withstand atmospheric pressure, the outer enclosure, or shell, would have to be constructed of strong and therefore heavy material. In addition, the inner container would require multiple attachments to the outer enclosure for adequate support thereof in maintaining proper spacing between the container and enclosure. These attachments or support members tend to transmit heat, by conduction, to the cryogenic fluid within the inner container.

SUMMARY OF THE INVENTION

The present invention seeks to overcome the deficiencies of prior-art cryogenic containers by reducing the total weight thereof and minimizing transfer of heat by radiation, convection and conduction into the cryogenic fluid. In achieving these objectives, a light weight container is constructed having localized reinforcement lands located in critical areas of attachment to an outer structure. Bonded or otherwise secured to these lands at spaced apart locations is a multiplicity of fittings from which flexible tension members project in radial to tangential directions with respect to the container wall. These fittings serve also to space a shield from the container wall and further serve as an attachment means to secure the shield to the container. Multiple layers of insulation material mount on the tension members adjacent the shield. The shield acts as a barrier to prevent cryogenic fluid from escaping through the wall of the container into the insulation material, thus causing deterioration and diminishing its insulating effectiveness. The insulation material is preferably fabricated from aluminized sheets of polyethylene terephthalate material available from E. I. duPont de Nemours under the trademark "Mylar." Individual layers of Mylar are spaced from one another and from the adjacent shield by upstanding hair-like fibers or flocking bonded to the Mylar in small tufts arranged in a diamond-shaped pattern. This type of insulation is described in greater detail in copending U.S. patent application Ser. No. 670,889, filed Sept. 27, 1967, now abandoned. Preferably the insulation is cut in gores to conform to the container configuration, such as a sphere-shape, and is packaged between face sheets of scrim cloth for reinforcement purposes. Various well-known fasteners may be used, if desired, for additional means to secure the insulation onto the shield in addition to the support afforded by engagement with the tension members.

The outer support structure surrounds the container, shield, and insulation material. Relative movement between the container and outer structure is provided for to permit container "breathing" as a result of pressure and temperature changes. This is accomplished by a biasing means such as a leaf or compression spring installed on the tension members between the outer surface of the outer structure, and a nut screwed-threaded on the end thereof. The tension force of each tension member may be individually adjusted by tightening the nuts to minimize the tension load carrying capability required of the fasteners which assemble the outer shell structure components together.

In keeping with a primary object of the invention, the weight of the outer structure is maintained at a minimum level by its unique construction. Elongated members of angular form such as a flanged channel, or U-shape, are arranged to circumvent the container in an intersecting pattern. The tension members preferably extend through the outer structure at these intersections. A shell or skin is secured to the elongated members, or may be integral with them, to form an enclosure covering the container and the insulation.

An object of the present invention is to provide a spaced wall container in which the inner and outer walls co-act with one another to effect a composite stabilized and stiffened load carrying structure.

Another object of this invention is to provide a spaced wall container having an inner container wall and an outer container shell structure capable of expanding and contracting independently of one another.

Another object of this invention is to provide a spaced wall container capable of absorbing and minimizing stresses created by expansion and contraction.

A further object of this invention resides in the ability of the pressure-stabilized inner container to structurally stabilize the outer shell structure.

A still further object of this invention is to provide a spaced wall container having a high strength-to-weight ratio.

Other objects and advantages will become apparent to those skilled in the art from the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of a spaced wall container embodying the present invention having portions broken away to facilitate the illustration.

FIG. 2 is a fragmentary elevational view of the container shown in FIG. 1 having portions broken away and in section to disclose the novel features of construction.

FIG. 3 is an enlarged cross-sectional view taken on the line 3—3 of FIG. 2 showing the construction detail through one of the tension members connecting the inner container or tank to the outer structure.

FIG. 4 is a transverse sectional view through the tension member taken on the line 4—4 of FIG. 3.

FIG. 5 is a transverse sectional view through the tension member taken on the line 5—5 of FIG. 3 showing the conduits and ports used in venting and purging the insulation.

FIG. 6 is a fragmentary perspective view of a modified spaced wall container construction, and

FIG. 7 is a fragmentary perspective view of a further modified spaced wall container construction.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. 1 and 2 there is shown a container 20 of spherical configuration preferably formed of a light-weight material such as aluminum. It is to be noted that the particular shape of the container 20 is not limited to the spherical shape shown since it is contemplated that other shapes and geometrical configurations can readily be constructed in accordance with the teachings of the present invention. Container 20 comprises an upper hemisphere 22 joined to a lower hemisphere 24 by welding one to the other along the equator 26 of the sphere formed thereby. A conduit 28 secured to the hemisphere 24 as by welding, comminicates with the interior of the container 20 for conducting fluids into and out of the container. A bellows 30 is provided in the conduit 28 to provide for axial elongation and contraction of the conduit as a result of thermal and pressure changes. Container 20 is vented by a vent line 32 which passes outwardly of the container through the wall of the lower hemisphere 24. Vent line 32 is similarly provided with a bellows 34 to accommodate thermal and pressure elongation and contraction thereof as well as of the inner wall and outer structure.

As shown in FIG. 3, the wall of the container 20 is locally reinforced by continuous bands 36 of increased wall thickness. These bands 36 girdle the container at selected elevations to provide reinforcement for attachment of tension members as will hereinafter be more fully described. Bands 36 may be formed in the container wall, for example, by chemical milling or machining. Fittings 38 are secured to the bands 36 at spaced locations by welding or bonding the base 40 thereof to the bands. Projecting from the base 40, is a hub portion 42 having a recess or axial bore 44 and a reduced diameter bore 46 intersecting bore 44. A retainer 48 comprises a base 50, hub portion 52 projecting from base 50, a tapered bore 54 extending through base 50 and hub 52, a reduced diameter bore 56 intersecting bore 54, passageways 58, 60, 62, 64 and 66 and discharge ports 68 in base 50. Hub 52 of retainer 48 is telescopically received within bore 44 of fitting 38. A clevis pin 70 projects through transverse bores 46 and 56 of fitting 38 and retainer 48 respectively to secure the retainer 48 to the fitting 38 after the tension member 86 has been assembled to the retainer 48 as will be hereinafter described in greater detail. A cotter key 72 installed on clevis pin 70 prevents removal or accidental displacement of pin 70 from the bores of the assembled fitting 38 and retainer 48.

Surrounding the container 20 is a shield 74 fabricated from a light-weight material such as aluminum or fiberglass. Shield 74 is secured to the base 50 of retainers 48 by rivets 76, or if desired, by bonding or a combination of riveting and bonding. Openings 78 of sufficient dimensions to clear the ports 68 in the retainers 48 are provided in shield 74 around each of the tension members 86.

Adjacent shield 74, are multiple layers of insulation material 80. As hereinbefore described, insulation 80 is preferably fabricated from thin Mylar sheets aluminized to provide a reflective surface. Upstanding tufts of flocking fibers are bonded to the Mylar sheet to act as spacers to space one sheet from the adjacent sheet and from the shield 74. For ease of installation, the insulation 80 is cut in gores and pre-punched to fit loosely around each of the tension members 86. Reinforcing patches 82 surround each of the pre-punched holes 84 to provide additional strength to prevent tearing on assembly over the tension members 86.

Tension members 86 are fabricated from continuous, undirectional, fiberglass rovings or strands impregnated with epoxy resin. Opposite ends of tension members 86 are enlarged, diverging into cone-shaped configurations with the fiberglass rovings fanned outwardly into the resin cones. In order to permit insertion through the tapered bore 54 of retainers 48, the coned-end 88 of tension member 86 is of slightly lesser diameter than the smallest diameter of the bore 54. Tension member 86 must be installed with the smaller coned-end 88 being inserted through bore 54 until the larger coned-end 90 seats in the tapered bore 54 before the clevis pin 70 is installed.

Encompassing the coned-end 88 of tension member 86 is a split retainer 92 having a tapered bore 94 in which the cone 88 seats. Retainer 92 is formed in two or more parts to permit installation around the one-piece tension member 86. A sleeve 96 having a bore 98, receives the retainer 92. An inwardly directed flange 100 of the sleeve 96 forms an abutment against which the end of retainer parts 92 shoulder. Bore 98 opens into an enlarged threaded bore 102 in which a stud 104 is threadably engaged. The external surface of sleeve 96 is of hexagonal shape (FIG. 4) and is slidably engaged with the internal hexagonal bore 106 of a spline member 108. Thus, the sleeve 96 may be moved axially within the spline member 108 while being restrained against rotational movement therein. Spline member 108 is hexagonal shaped in cross-section as shown in FIG. 4 having an enlarged flanged head 110 coextensive with the hexagonal body 112.

Radially spaced from the insulation material 80 is an outer structure generally designated by the numeral 114 surrounding the container 20. Outer structure 114 is comprised of an upper hemisphere 116 joined to a lower hemisphere 118 at the equator 120 by welding or the like. A turret housing 122 integral with and projecting from the lower hemisphere 118 encloses drain and fill conduit 28, vent line 32 and a vent conduit 124 connected to shield 74 and communicating with the annulus 126 between the container 20 and the shield 74. An end plate 128 forms the bottom closure of turret 122 and is secured thereto in a leak-tight manner such as by welding. End plate 128 also serves as a means for the support of conduit 28, vent line 32 and vent conduit

124 each of which is attached thereto as by welding or other suitable fastening means. Insulation material 130 similar to insulation 80 is spaced inwardly from the wall of turret 122 and surrounds the conduits 28, 32, and 124. One end of insulation 130 abuts against insulation 80 and the opposite end thereof abuts against insulation 132, also similar to insulation 80, positioned on the inside surface of end plate 128. Thus, heat transfer is minimized through the turret and end plate 122 and 128 respectively and the outer structure 114 by the insulation material 130, 132, and 80. If desired for additional insulation purposes, wrappings 81 of insulation material similar to insulation 80 may be installed around tension members 86 between the insulation 80 and the sleeve 96 as shown in FIG. 3.

A vent fitting 134 projects from the wall of turret 122 to provide means for attachment to a vacuum pump (not shown) to purge and evacuate the areas between the individual layers of insulation 80 and 130, the annulus 136 between shield 74 and outer structure 114, and the annulus 138 enclosed by the turret 122.

Outer structure 114 is preferably fabricated from a light weight material such as aluminum. As shown in FIGS. 1 through 4, outer structure 114 forms an enclosure or shell around the container, shield, and insulation. Upper and lower hemispheres 116 and 118 respectively are reinforced by a grid work of upstanding ribs 140. Ribs 140 may be integrally formed on the hemispheres as by machining or chemical milling, or may be individual members attached to the hemisphere shells as by bonding or welding. In selected areas, preferably at rib intersections, additional reinforcement is provided by ring ribs 142. The hexagonal body 112 of spline members 108 engage similarly shaped openings through the outer structure 114 in the area encircled by the ring ribs 142. In order to provide adequate engagement of the flat surfaces of the hexagon spline member 108, outer structure 114 is preferably of greater thickness within the area surrounded by the ring ribs 142.

Studs 104 connected to tension members 86, project into the ring rib annulus 144. Biasing means in the form of a compression spring, or as shown in FIG. 3, belleville spring washers 146, are installed on studs 104. Springs 146 are interposed between the flanged head 110 of spline members 108 and a nut 148 screw threaded on stud 104. A lock or jamb nut 150 serves to prevent loosening of nut 148 after proper tension has been applied to the tension member 86 by adjustment of the nut 148. A cap 152 welded or otherwise secured to the ring ribs 142, serves as a vacuum seal in addition to its functioning as a dust cover.

Referring now to FIGS. 3 and 5 of the drawings, means are illustrated for injecting purge gas such as helium into and between the individual layers of insulation 80. Gas is ducted from a source outside of the spaced wall container of the instant invention through a system of conductors 154 and 156 into each successive retainer 48. Passageways 60, 62, 64, and 66 of retainers 48 conduct the gas to the discharge ports 68. Openings 78 and 84 in the shield 74 and insulation 80 respectively are of sufficient size to receive unrestricted flow of the purge gas into and around the individual layers of the insulation 80. Purge gas is then vented from in and around the insulation 80 and 130 through the vent fitting 134 projecting from the wall of the turret 122. Upon evacuation of the purge gas, a vacuum is created in the annuli 136, 138 and insulation layers 80, and 130 to minimize heat transfer through the outer structure 114 due to conduction and convection. Shield 74 together with its associated vent conduit 124, serves to channel leakage from container 20 to the exterior of the spaced wall container.

In assembling the spaced wall container, fittings 38 are positioned on the bands 36 of previously joined hemispheres 22 and 24 of the container 20 with the aid of a suitable positioning fixture in preparation for securing the fittings to the container. After the fittings are secured, tension members 86 are assembled to the retainers 48 as previously described and thereafter the hubs of the retainers 48 are installed in the bores of the fittings 38. Clevis pins 70 are then inserted through the transverse bores in the fittings and retainers and locked in place with the cotter keys 72. Conductors 154 and 156 of the gas purge system may then be connected to the retainers 48. The pre-punched shield 74 is installed over the outstanding tension members 86 and bonded or riveted to the base 50 of the retainers 48. Multiple layers of insulation material 80 cut in the form of gores, are pre-punched and fitted with reinforcement patches 82 after which the individual layers of insulation 80 are installed on the tension members 86. The gores are taped together at their abutting edges to provide insulation integrity and strength continuity. Preferably the abutments are arranged in staggered pattern with respect to adjacent layers to minimize thermal transport through abutment gaps that may occur due to dimensional variations of the individual gores. If desired, wrappings 81 of insulation material may be installed on the tension members 86 for added insulation purposes. Sleeves 96 are telescopically installed over the tapered ends 88 of the tension members 86 and pressed against the wrappings 81, causing insulation 80 to compress slightly towards shield 74. This allows the tapered ends 88 of the tension members 86 to protrude beyond the bores 98 of the sleeves 96 permitting installation of the split retainers 92 on the exposed tapered ends 88.

Upper and lower hemispheres 116 and 118 may next be moved into position until the axis of ring ribs 142 align with the axis of tension members 86. Spline members 108 are then inserted through the hexagonal bores in the hemisphere wall to telescopically engage the hexagonal outer surface of the sleeves 96 until the flanged head 110 thereof seats against the hemisphere wall. Studs 104 may then be screw threaded into the threaded bore of the sleeves 96. Belleville springs 146 are installed over the studs 104 following which the nuts 148 are installed and adjusted to properly tension the tension members 86. Jamb nuts 150 are threaded on studs 104 to lock nuts 148 against turning. Caps 152 are welded to each of the ring ribs 142 to vacuum seal and serve as dust covers.

Upon completion of assembly, helium or other suitable purge gas is injected into the annulus 136 through the system of conductors 154, 156, and ports 68 of the retainers 48 as hereinbefore described. Purge gas is drawn off through vent fitting 134 thus evacuating the annulus 136 to increase insulating efficiency.

FIG. 6 illustrates a modified form of the present invention. In this embodiment, the container 200 having bands of increased wall thickness 202 is similar in construction to the container 20 and band 36 of the principal embodiment described in connection with the showings of FIGS. 1 through 5. Fittings 204 having tension members 206 extending therefrom are bonded to the bands 202 at spaced intervals as similar to the arrangement of the fittings 38 of the principal embodiment. Multiple layers of insulation material 208 equivalent to insulation 80 are placed directly on the outer surface of the container 200. Insulation 208 is formed in gores having openings to accommodate passage of the tension members 206 therethrough. Spaced radially outward of the insulation 208 is the outer structure generally designated by the numeral 210. In substitution for the integrally stiffened outer structure 114 of the principal embodiment, outer structure 210 is comprised of individual components of skin-stringer construction. Circumferential rings 212 of a flanged U-shaped cross-section encompass container and insulation material 200 and 208 in horizontal planes at various elevations. Upper skin segment 214 overlaps lower skin segment 216 at the joinder to the rings 212 and are secured thereto as by fasteners 218. Flanged u-shaped stringers 220 are positioned externally of the skin segments 214, 216 substantially normal to the rings 212. Stringers 220 are riveted at 222 through their flanges to upper and lower skins 214 and 216 and through the flanges of the rings 212 in areas of intersection of rings and stringers. Tension members 206 pass through openings provided in rings 212, skins 214, 216 and stringers 220, terminating in a screw threaded end 224. A biasing member 226 having flanged end portions 228 adapted to interlock with stringers 220, are provided with an arch portion 230 having a bore through the center thereof for mounting on threaded end 224 of tension members 206. Nuts 232 retain biasing members 226 on the tension members 206 in addition to providing means for individually adjusting the tension load borne by each of the tension members 206.

FIG. 7 illustrates a further modification of the embodiment of FIG. 6 wherein the modifications lie in the outer structure with the container and insulation being of similar construction to that as described in connection with FIG. 6. In this arrangement, the outer structure generally designated by the numeral 300 comprises rings 302 304. channel-shaped cross-section horizontally disposed at various elevations about the container 04. Rings 302 are provided with inwardly directed flanges 306 extending from a web portion 308 which is attached by fasteners 310 to skin segments 312 and 314. Spaced at intervals about the circumference of rings 302 are skins 316 of a width dimension substantially coinciding with the overall width of a flanged U-shaped stringer 318 overlying the skins 316. Skins 316 and stringers 318 are positioned approximately normal to the horizontally disposed rings 302. Openings are provided in the web 308 of rings 302 and the skin 316 to provide for passage of flexible tension members 320 therethrough. Biasing means 322 secured to skin 316 and rings 302 by fasteners 324 have an opening through which the threaded end 326 of tension members 320 protrudes. Joggled edges 330 of skin segments 312, 314 are secured to skins 316 and the flanges of stringers 318 by rows of fasteners 332.

In assembling the outer structure of FIG. 7, it will be apparent that the biasing means 322 and associated nuts 328 are located in a blind area and must therefore be installed on the tension members 320 and properly adjusted prior to the installation of the stringers 318. However if desired, final tensioning of tension members 320 may be accomplished after stringers and skin segments have been secured to the rings by providing access holes (not shown) through the stringers in axial alignment with the tension members. Subsequent to adjustment of the tension members, the access holes may be closed with plugs, patches or the like to assure vacuum sealing in addition to preventing foreign matter from gaining entry into the internal structure.

It will be apparent from the foregoing description that the various biasing means disclosed for each embodiment of the instant invention serve as springs to equilibrate container breathing due to pressure and temperature changes. In addition, the pretensioning of the tension members of the embodiments of FIGS. 6 and 7 also minimizes the tension load carrying capability required of the fasteners that assemble the individual components of the outer structure.

It will be further apparent that the tension members serve in a dual capacity as a means for supporting the insulation material, and as structural members integrating the container and outer structure to provide uniform, shock attenuating support for the container and structural stability for the outer structure.

The embodiments described above and shown in the accompanying drawings are illustrative of specific forms of the present invention. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A spaced wall container comprising:
an inner wall,
an outer support structure spaced from said inner wall,
said outer structure comprising a plurality of intersecting elongated members,
a shield positioned intermediate said inner wall and said outer support structure,
said shield enclosing said inner wall, and
a plurality of tension members projecting through openings in said shield to connect said inner wall to said outer structure whereby said inner wall is uniformly supported and said outer structure is structurally stabilized.

2. A spaced wall container comprising:
an inner wall container,
said inner wall container having bands girdled therearound at selected elevations,
fittings secured to said bands at spaced locations,
retainers secured to each of said fittings,
a shield surrounding said inner wall,
said shield being secured to at least some of said retainers,
tension members engaged with and projecting from at least some of said retainers,

insulation material supported on said tension members,
an outer structure enclosing said insulation material, shield, and inner wall container,
said outer structure comprising a shell having reinforcing elongated members arranged in a grid pattern,
said outer structure being connected to said inner wall container by said tension members, and
biasing means mounted on at least some of said tension members for biasing said inner wall container and said outer structure towards one another.

3. The spaced wall container of claim 2 in which:
a system of conductors conducts purge gas into and around said insulation material.

4. The spaced wall container of claim 3 in which:
conduits project from said inner wall container for draining, filling, and venting said container.

5. The spaced wall container of claim 4 in which:
a turret projects from said outer structure.

6. The spaced wall container of claim 5 in which:
a vent conduit connected to said shield projects through said turret for venting the annulus between said inner wall container and said shield.

7. The spaced wall container of claim 6 in which:
a vent fitting connects to said turret for venting said insulation and the annulus between said shield and said outer structure.

8. A spaced wall container comprising:
an inner wall,
an outer support structure spaced from said inner wall,
said outer structure comprising an enclosure surrounding said inner wall having a plurality of intersecting elongated members projecting therefrom,
a shield enclosing said inner wall,
insulation material positioned intermediate said shield and said outer structure,
a system of conductors for conducting purge gas into and around said insulation material,
a plurality of tension members projecting through openings in said shield and insulation materials connecting said inner wall to said outer structure,
certain of said tension members passing through the intersection of the elongated members of said outer structure, and
biasing means mounted on at least some of said tension members for biasing said inner wall and said outer structure toward one another.

9. The spaced wall container of claim 8 in which:
said system of conductors is positioned between said inner wall and said shield.

10. The spaced wall container of claim 9 in which:
said system of conductors communicate with discharge ports around each of said tension members.

* * * * *