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[54] **CONVOLUTE GROUND PACKAGE OF CYLINDRICAL OBJECTS**
 5 Claims, 2 Drawing Figs.

[52] U.S. Cl..... **206/65,**
 206/59, 250/106
 [51] Int. Cl..... **B65d 85/20,**
 B65d 85/30, B65d 85/66
 [50] Field of Search..... 206/65, 65
 F, 65 C, 78, 56 A, 17, 46 F, 46 C, 46 M; 220/41;
 211/60; 250/106 S

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ABSTRACT: A package capable of holding up to 35 pounds and more of uranium pellets is constructed with a polyurethane strip having a thickness greater than the radius of the pellet and a large length-to-width ratio. The strip has on one of its surfaces a plurality of parallel grooves positioned transversely to the longitudinal axis of the strip. Each of the grooves has a depth at least about the radius of the pellet and a width at the surface of the strip about the diameter of the pellet. The strip with the pellets is wound into a convolute package holding the pellets therein firmly between the adjacent layers of the convolution and by the sidewalls of the grooves pinched against the pellets.

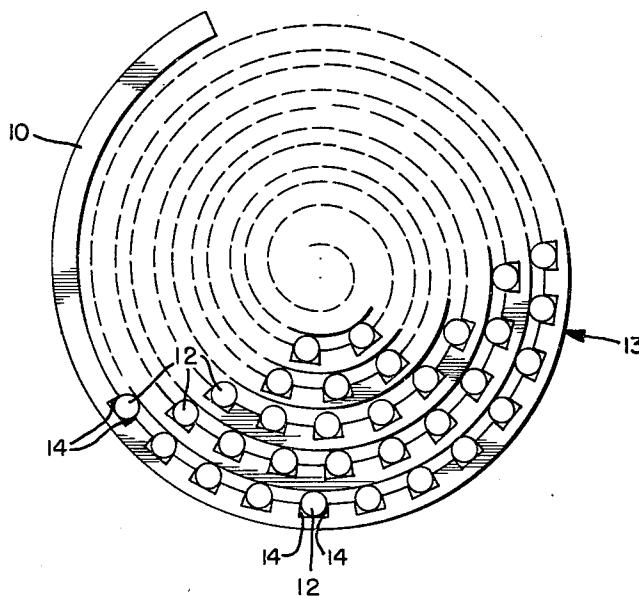


FIG. 1

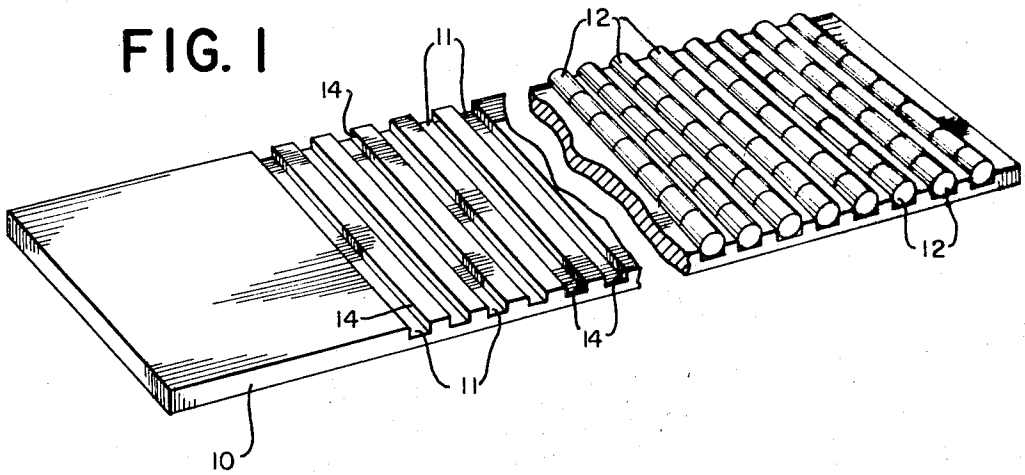
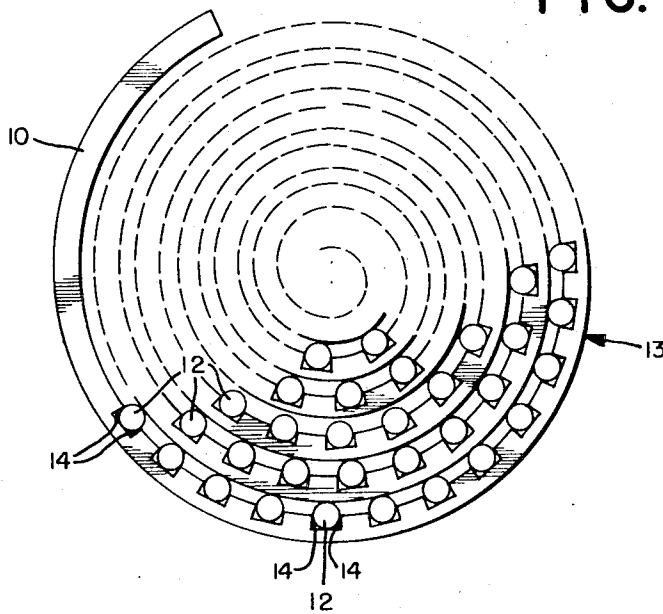


FIG. 2



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CONVOLUTE GROUND PACKAGE OF CYLINDRICAL OBJECTS

FIELD OF THE INVENTION

This invention relates to a package and more particularly to a package of uranium fuel pellets and the like.

SUMMARY OF THE INVENTION

Uranium oxide pellets which are used as a fuel for nuclear reactors are heavy and relatively fragile. Transporting these pellets requires special packaging to prevent damage of the pellets in shipment. I have discovered uranium pellets and the like can be shipped safely with the package of this invention. Broadly stated, the package comprises a strip of resilient polymeric material having on its inwardly facing surface a plurality of grooves positioned substantially transversely to the longitudinal axis of the strip. Each of the grooves has a depth at least about the radius of the pellet and a width at the surface of the strip about the diameter of the pellet. A plurality of the pellets is positioned in the grooves and the strip with the pellets is wound into a form of a convoluted holding the pellets therebetween and firmly with the sidewalls of the grooves which pinch against the pellets.

DESCRIPTION OF THE DRAWINGS

The accompanying single sheet of drawings shows in: FIG. 1 a perspective view of the strip partly in section and before it is wound into the package, and in FIG. 2 a cross section of the convolute package of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG. 1 the packing strip 10 of this invention is preferably constructed from a rectangular resilient polymeric sheet which has a thickness greater than the radius of the pellets and a substantially large length-to-width ratio, the long strip having thereon a plurality of parallel grooves 11 which are positioned transversely to the longitudinal axis of the strip 10. The grooves may be in any suitable form such as in the form of a rectangular slot as shown in FIG. 1. The grooves should have a depth about the radius of the pellet and a minimum width at the surface of the strip 10 about the diameter of the pellet. Advantageously, the grooves should have substantially vertical sidewalls which, as will be apparent from subsequent discussion, will hold onto the pellets firmly when the strip 10 with the pellets 12 is rolled into a convolute package 13 as shown in FIG. 2.

The pellets 12 which are in the form of small cylinders are produced by compacting fine uranium dioxide with a binder at high pressure and subsequently sintering at high temperature and grinding to the desired dimensions. These pellets are placed end to end on the grooves as illustrated in FIG. 1.

When the strip 10 is filled with pellets, it is rolled to form the convolute package of the invention. As shown in FIG. 2 the pellets are held firmly between the two adjacent layers of the convoluted and by the sidewalls 14 of the grooves which, as the strip is rolled, tend to pinch against the pellets. The resultant convolute package 13 is now ready for casing and shipment.

The packing strip preferably is constructed from a polymeric material such as polyurethane foam. Other resilient polymers such as polyethylene and polypropylene may also be used. The thickness of the strip depends to a certain extent on the physical characteristics of the polymer and to the size of the pellet. Generally, the thickness of the strip should not exceed the diameter of the pellet.

I found that a package about 8 feet in diameter and 9 inches long will hold about 35 pounds of pellets without damage in shipment.

I claim:

1. A package of cylindrical uranium pellets which comprises a strip of resilient polymeric material having on its inwardly facing surface a plurality of grooves positioned substantially transversely to the longitudinal axis of the strip, each of said grooves having a depth at least about the radius of the pellet and a width at the surface of the strip about the diameter of the pellet, and a plurality of said pellets positioned within said grooves, said strip with the pellets being in the form of a convoluted holding the pellets between adjacent layers thereof, and the transverse movement of the pellets being limited by the sidewalls of the grooves pinched against the pellets.

2. A package according to claim 1 wherein the grooves have substantially vertical sidewalls before the strip is formed into a convolute package.

3. A package according to claim 2 wherein the strip is made of polyurethane.

4. A packing strip suitable for packing fragile elongated cylindrical objects which comprises a strip of resilient polymeric material having a thickness greater than the radius of the elongated object and a substantially large length-to-width ratio, said strip having on one of its surfaces a plurality of parallel grooves of uniform dimensions positioned substantially transversely to the longitudinal axis of the strip, each of the grooves having a depth of at least the radius of said object and a width at the surface of said strip about the diameter of said object, a plurality of objects being positioned in said grooves, said strip with said elongated objects being wound into a convolute package with the grooves facing inwardly, the elongated objects being firmly held by adjacent layers of the convoluted and by the sidewalls of the grooves pinched against said elongated objects.

5. A packing strip according to claim 4 which is made of polyurethane.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,631,973 Dated January 4, 1972

Inventor(s) James A. Rode

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Title, delete "Ground" and substitute in place thereof --Grooved--

Signed and sealed this 30th day of May 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents