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BULK BAGS

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FIG. 1.

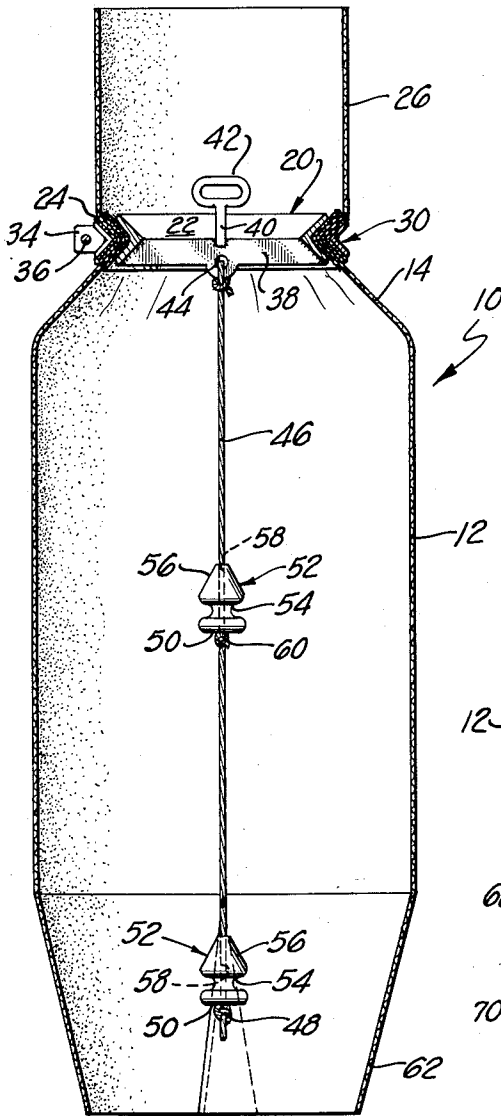
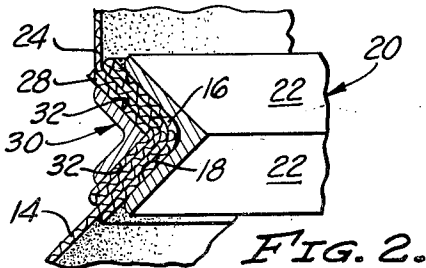


FIG. 2.

FIG. 3.

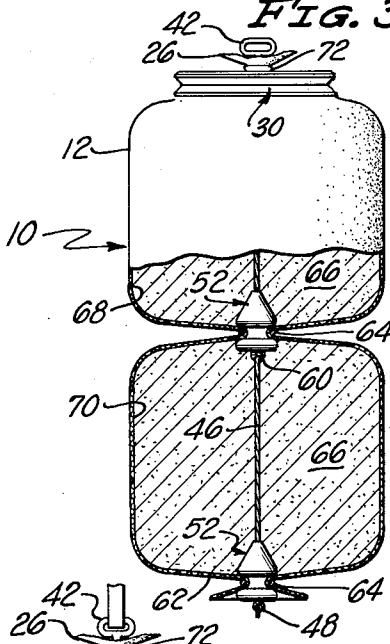
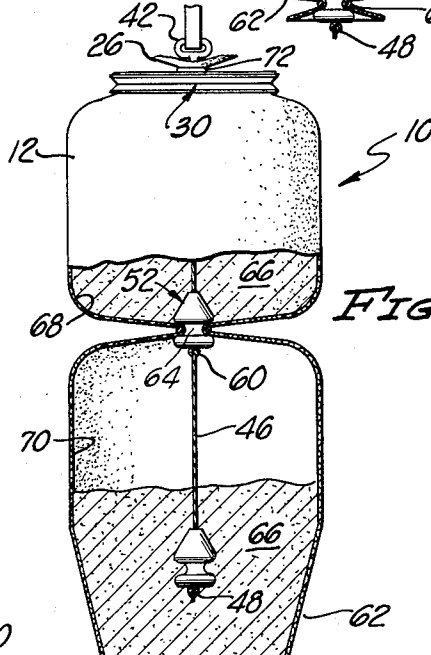


FIG. 4.

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BULK BAGS

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This invention pertains to new and improved bulk bags.

At the present time there is a very definite trend toward the shipment of comparatively large quantities of granular materials in much larger containers than has been used in shipping the same materials before. Cost is a primary factor causing this industrial trend. It is well known that prior small containers, such as, for example, paper cement sacks holding up to about 94 lbs. of cement are relatively expensive on a comparative basis. It is also well known that it is impossible to utilize such sacks more than once. It is also known that prior comparatively small containers of this type do not provide adequate protection for their contents from various ambient factors such as, for example, rain.

An object of the present invention is to provide new and improved bulk sacks which can be used in transporting comparatively large quantities of materials when compared with prior containers such as paper sacks and the like. A related object of the present invention is to provide bulk sacks which are constructed in such a way as to provide adequate protection for the contents of these containers against moisture and various related factors. Another object of the present invention is to provide bulk sacks which are easily and conveniently constructed at a comparatively nominal cost.

This invention is also intended to provide bulk sacks which are constructed in such a manner that the weight of the material carried in these sacks during their use is satisfactorily distributed in such a manner as to prevent any tendency of these sacks to stretch out or break during their use. A purpose or object of this invention is also to provide bulk sacks utilizing bottom closure means so that these sacks may be easily and securely tied shut, and so that such closure means may be actuated in order to release the contents of such sacks so that they may be discharged. Another object of this invention is to provide bulk sacks of the type indicated above of a "compartmentalized" variety, so that the same or different quantities of the same or different materials can be carried in them so as to be segregated from one another. By virtue of this feature it is possible to utilize a single bulk sack of this invention in transporting more material than a user normally will require at any one period.

These and various other objects of this invention as well as many specific advantages of it will be fully apparent to those skilled in the art to which this invention pertains from a detailed consideration of the remainder of this specification including the appended claims and from the accompanying drawing in which:

FIG. 1 is a side view of a bulk sack of this invention, this view being in cross section;

FIG. 2 is an enlarged, detail view showing the construction of a part of this bulk sack;

FIG. 3 is a side elevational view similar to FIG. 1 illustrating the use of this bulk sack, this view being partially in section; and

FIG. 4 is a view similar to FIG. 3 illustrating a feature of the bulk sack shown in the preceding figures.

It is to be understood that the accompanying drawing is not to be taken as limiting this invention in any respect. Those skilled in the art to which this invention pertains will realize that differently appearing bulk sacks utilizing the inventive features set forth in this specification and

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defined in the appended claims may be designed through the use of routine engineering skill or ability.

As an aid to understanding this invention it can be stated in essentially summary form that it concerns bulk sacks, each of which is formed so as to include an elongated, tubular sack having open top and bottom ends, a rigid ring secured to the top end of the sack, a support member secured to this ring so as to extend along the center of the sack, and at least one closure member adapted to contain the sack when the sack is gathered, this closure member being located upon this support member.

The actual details of this invention will be best more fully apparent by referring to the accompanying drawing in which there is shown a bulk sack 10 of the present invention. This bulk sack 10 includes an elongated, tubular sack 12 formed of a flexible fabric so as to have a generally cylindrical configuration. The top 14 of this sack 12 is folded upon itself and gathered as indicated in FIG. 2 of the drawing so as to provide an extra layer 16 of fabric fitting against a generally V-shaped groove 18 extending continuously around the exterior of the metal ring 20. The layer 16 serves to provide protection for the bag 12 as a whole against abrasion by the ring 20. This ring 20 is preferably formed out of angle iron or the like so as to include walls 22 located at approximately a 90° angle to one another. It will be seen from a consideration of FIG. 2 that these walls 22 both slope generally toward a line drawn through the axis of the center of the sack 12.

Around the top 14 of the sack 12 there is located an end 24 of a tubular cover 26 formed of a flexible fabric. This end 24 is also preferably folded over upon itself so as to include an extra layer 28 of fabric located generally away from the ring 20. This layer 28 is designed to provide protection against wear with respect to a retainer 30. This retainer 30 is preferably formed of metal and is located so as to extend against the top 14 of the sack 12 and the end 24 of the cover 26 within the groove 18 so as to hold these parts of the bulk sack 10 with respect to a ring 20. Preferably the retainer 30 has internal walls 32 located with respect to one another at approximately the same angle as the angle between the walls of the V-shaped groove 18 in order to provide a maximum area of friction tending to oppose slippage of the sack 12 and the cover 26 away from the ring 20. The retainer 30 as indicated in FIG. 1 of the drawing is preferably of a split ring character and is provided with terminal flanges 34 which are adapted to be drawn toward one another by means of a common bolt 36 when the bulk sack 10 is being assembled.

Within the bulk sack 10 it is preferred to attach a cross brace 38 to the ring 20 so as to extend across a diameter of this ring. This cross brace 38 may be conveniently secured in place to one of the walls 22 by welding or other equivalent techniques. At its center it carries a small rod 40, the extremity of which away from the ring 20 is provided with an eye 42 adapted to be used in lifting the entire bulk sack 10. The cross brace 38 is also provided with a hole 44 at its center. An end of a support member 46 is secured to this hole 44 so as to extend from the brace 38 along the center of the sack 12. Preferably this support member 46 is a steel cable or the like which is sufficiently flexible so as to permit it to be collapsed and folded up when the sack 10 is not in use. Other functional equivalents such as chains, rods or the like can, of course, be used for the member 46.

At the end of the support member 46 remote from this ring 20 a projection 48 such as, for example, a knot is formed upon the support member 46. This projection 48 serves as a bearing surface for the bottom 50 of a closure member 52; it preferably has a periph-

eral groove 54 extending completely around its exterior immediately above its bottom 50 and a conical top wall 56 pointing upwardly toward the ring 20. A hole 58 is, of course, located along the center of this closure member 52 so as to permit its being located around the support member 46. Preferably at least one other projection 60 is formed upon the support member 46 intermediate to its ends. Such another projection 60 (or projections if more than one is used) also carries a closure member 52 (or closure members if more than one projection is employed), as described above.

With the bulk sack 10 preferably the bottom 62 of this sack is tapered slightly as indicated in FIG. 1 of the drawing. During the use of this bulk sack such a tapered bottom 62 is gathered so as to define a rather restricted opening and is forced into the groove 54 in the closure member 52 located adjacent to it. This bottom 62 may be conveniently secured to the closure member 52 by passing a rope 64 or the equivalent around the closure member 52 so that this rope 64 fits within the groove 54 in the closure member 52. The shape of the groove 54 thus prevents any chance of this rope 64 slipping out of place when material 66 is placed within the bulk sack 10.

During the use of this bulk sack 10 after the bottom 62 has been secured in this manner, material 66 such as aggregate, concrete or the like may be introduced into the sack 10 through the cover 26 and the ring 20. Preferably the quantity of material 66 initially introduced into the sack 10 is sufficient so as to fill this sack up to shortly below the level of the other projection 60. At this point the sack 12 is preferably gathered around about the other closure member 52 used and is forced into the groove 54 in this other closure member using a rope 64 as previously described. At this point upper and lower compartments 68 and 70, respectively, are created within the sack 10 as indicated in FIG. 3 of the drawing and the upper compartment 68 may then be filled with the same or different quantity of the same or a different material than that used to fill the bottom 62 of the sack 10.

After the sack 10 has been completely filled in this manner the cover 26 may be twisted and gathered about the rod 40 as indicated in FIGS. 3 and 4 of the drawings and may be tied in place using another rope 72 so as to seal the top compartment 68 created from the sack 12 as indicated by gathering it about the intermediate closure member 52.

In this condition or configuration the entire sack 10 may be transported from one location to another. When it is desired to empty this sack the rope 64 located at the bottom of it may simply be untied. When this is done the material 66 held in the bottom of the sack 10 will discharge through the tapered bottom 62 as indicated in FIG. 4 of the drawing. When this occurs, the bottom 62, because of its tapered configuration, will act essentially as a discharge chute. After this operation has been performed at either the same or a different location the other rope 64 may be untied and the remainder of the material held within the sack 10 may be discharged in a similar manner.

It will be realized that through the use of closure members, such as the closure member 52, the entire bulk sack 10 may be divided into any number of different compartments as may be desired for various applications. Further, preferably the compartments created in the sack 10 are proportioned as to size so as to hold either the same or different quantities of material, which quantities correspond to the quantities of materials a user normally desires to utilize at any one time. Thus, the bulk sacks of this invention can be used where not all of the material within them is utilized at one time. They can also be used when it is desired to supply materials in bulk, but to utilize such materials in measured

quantities of less than the entire bulk of material supplied at one time.

The utilitarian features indicated in the preceding discussion do not completely indicate all of the advantages of the present invention. Through the use of a closure member, such as a closure member 52, at the bottom of a bulk sack it is possible to easily and conveniently secure such a bottom closed so that there is substantially no danger of the contents of the sack being accidentally discharged, and so that the contents of the sack may be deliberately discharged when desired with only a nominal amount of effort. Further, a bottom closure member, such as a closure member 52, is a very effective means for distributing the stresses and strains placed upon a sack such as the sack 12, so as to relieve this sack from any forces which might tend to break it, and to transmit such forces to the stronger support member 46 extending through this sack. Similar effects in relieving against forces which might tend to break the fabric of the sack 12 are achieved through the use of intermediate closure members such as a closure member 52 previously described.

In order to provide adequate protection for the contents of a bulk sack, such as the sack 10, it is preferred to form both the sack 12 and the cover 26 out of a flexible fabric which has been covered with or impregnated with an elastomeric waterproofing composition, such as various types of synthetic rubbers or the equivalents. It will, of course, be realized that the sack 12 and the cover 26 may be formed of either woven or non-woven fabrics or other various similar materials.

Because of the nature of this invention and the fact that differently appearing bulk sacks than the specific bulk sack shown may be designed through the use of routine engineering skill this invention itself is to be considered as being limited only by the appended claims forming a part of this disclosure.

I claim:

1. A bulk sack which includes: an elongated, flexible, tubular sack having an open top and a tapered, open bottom; a support ring of smaller diameter than the diameter of said top of said sack, said support ring having a channel formed in the exterior thereof so as to extend around said support ring, said top of said sack being gathered so as to fit within said channel; retainer means located around said top of said sack adjacent to said channel, said retainer means serving to hold said sack with respect to said support ring; a cross brace secured to the interior of said ring so as to extend across said ring; a support member attached to said cross brace so as to extend therefrom through said sack to adjacent to said tapered bottom; a closure member attached to said support member at the end thereof adjacent to said tapered bottom, said closure member including a peripheral groove extending around said support member, said groove being adapted to receive said sack when said sack is gathered with respect to said closure member so as to hold the bottom of said sack closed at said closure member; and at least one other closure member attached to said support member within the interior of said sack, said other closure member extending around support member and including a peripheral groove extending around said support member, said groove on said other closure member being adapted to receive said sack when said sack is gathered with respect to said other closure member so as to divide said sack into compartments; and means for holding said sack within said grooves in said closure members.

2. A bulk sack as defined in claim 1 wherein said closure members include tapered top walls leading from said support member to adjacent to said grooves, said walls serving to prevent material from remaining upon said closure members during the use of said sack.

3. A bulk sack as defined in claim 1 wherein said support member is a flexible cable and wherein projections

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are formed on said cable and wherein said projection holds said closure members with respect to said support member.

4. A bulk sack as defined in claim 1 including eye means attached to said cross brace so as to extend therefrom away from said sack. 5

5. A bulk sack as defined in claim 1 including a tubular closure secured by said retainer means within said channel on said support ring, said tubular closure extending away from said sack. 10

6. A bulk sack which includes:

an elongated, flexible tubular sack having an open top and a normally open bottom;

a support ring of smaller diameter than the diameter of said top of said sack located interiorly of said top of said sack; 15

means securing said top of said sack to said support ring;

a support member extending through said sack along the center thereof from adjacent to said support ring to adjacent to said bottom of said sack; 20

support means adjacent to said support ring connecting an extremity of said support member to said support ring;

a closure means carried by said support means adjacent to said bottom of said sack and at least one other closure means carried by said support member intermediate the ends of said support member; and 25

means for holding said sack with respect to said closure means. 30

7. A bulk sack as defined in claim 6 wherein said support member is a flexible cable.

8. A bulk sack as defined in claim 6, wherein said sack is waterproof.

9. A bulk sack which includes:

an elongated, flexible tubular sack having an open top and a normally open bottom;

a support ring of smaller diameter than the diameter of said top of said sack located interiorly of said top of said sack; 40

means securing said top of said sack to said support ring;

a support member extending through said sack along the center thereof from adjacent to said support ring to adjacent to said bottom of said sack; 45

support means adjacent to said support ring connecting an extremity of said support member to said support ring;

a closure means carried by said support means adjacent to the bottom of said sack and at least one other closure means carried by said support member intermediate the ends of said support member, each of said closure means extending around said support member and including groove means extending around said support member; and 50

means for holding said sack within said groove means in said closure means so as to hold said sack in a configuration in which said sack is divided into compartments which are separated from one another. 55

10. A bulk sack as defined in claim 9 wherein said support member is a flexible cable. 60

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11. A bulk sack which includes:

an elongated, flexible tubular sack having a normally open bottom and a top end;

a support ring located internally of said top end of said tubular sack, said top end of said sack being secured to said support ring;

a flexible cable serving as a support member extending through said tubular sack within the center thereof from adjacent to said top end to within said normally open bottom;

means securing said flexible cable to said support member; and

a closure member located around said flexible cable at the end thereof adjacent to said bottom, said closure member being supported by said flexible cable and having a conical top surface directed toward said top of said sack and having a peripheral groove formed therein extending around said cable and located immediately below said top surface.

12. A bulk sack which includes:

an elongated, flexible tubular sack having a normally open bottom and a top end;

a support ring of smaller diameter than the diameter of said top of said sack located internally of said top end of said tubular sack;

means securing said top end of said tubular sack with respect to said support ring;

a flexible cable serving as a support member extending through said tubular sack within the center thereof from adjacent to said top end to within said normally open bottom;

means connecting said support ring to the adjacent extremity of said flexible cable;

knot means formed on said flexible cable adjacent to said bottom of said sack;

a closure member extending around said flexible cable and resting against said knot means so as to be supported by said knot means on said cable; and

means for securing said bottom of said sack to said closure member so as to close said bottom of said sack in a gathered configuration.

13. A bulk sack as defined in claim 12 wherein said closure member has a peripheral groove formed on the exterior thereof, said groove being adapted to receive a part of said sack when said sack is secured to said closure member, and wherein said groove extends around said support member.

14. A bulk sack as defined in claim 13 wherein said closure member includes a conical top wall located above said groove, said wall pointing toward said ring.

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