106-97 CROSS REFERENCE EXAMINE

Jan. 30, 1962 J. B. BRUGMANN 3,018,880

STABILIZED CONCRETE MIX AND METHOD OF USE THEREOF

Filed Dec. 30, 1957 2 Sheets-Sheet 1

Mixture proof for 10/C
Compartment Board

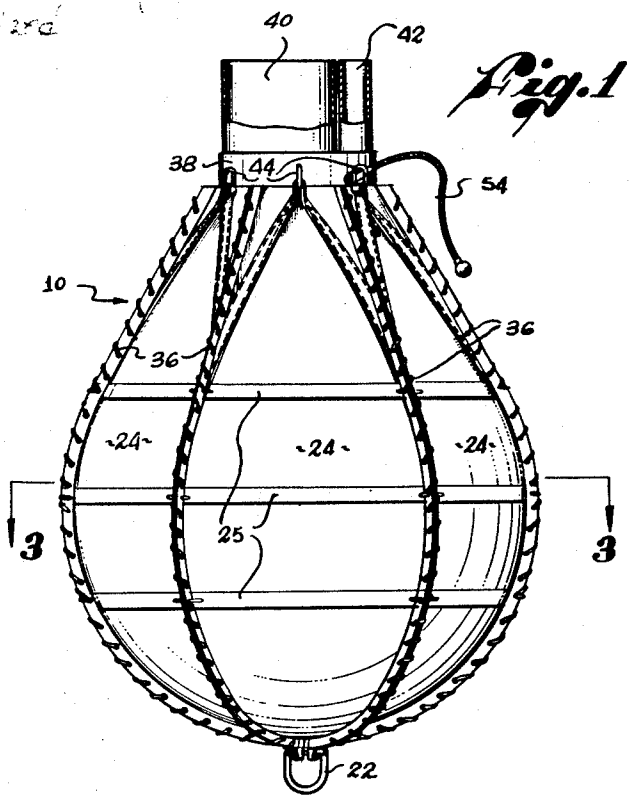


Fig. 1

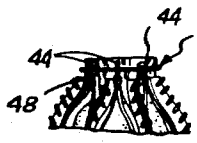


Fig. 2

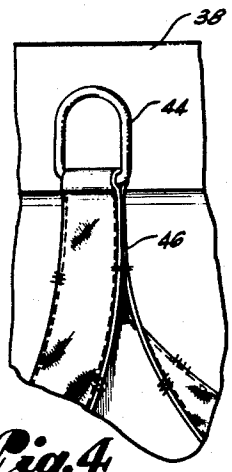


Fig. 4

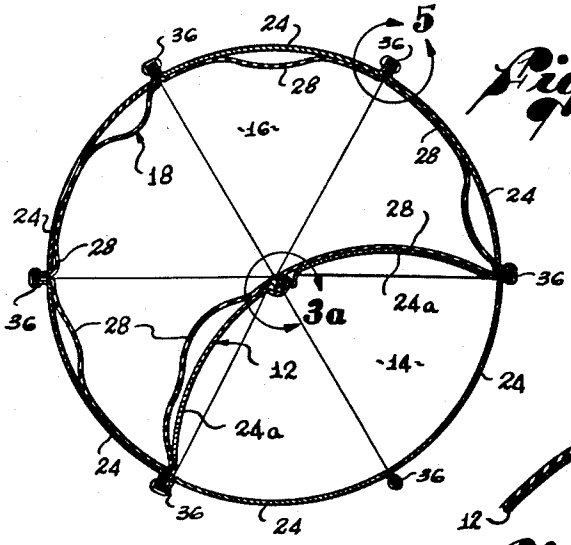


Fig. 3

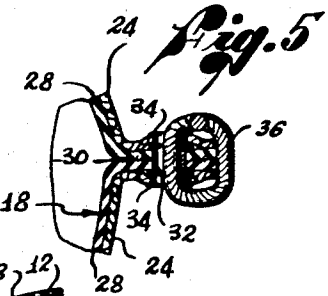


Fig. 5

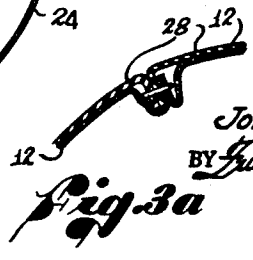


Fig. 3a

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STABILIZED CONCRETE MIX AND METHOD OF USE THEREOF

Filed Dec. 30, 1957 2 Sheets-Sheet 2

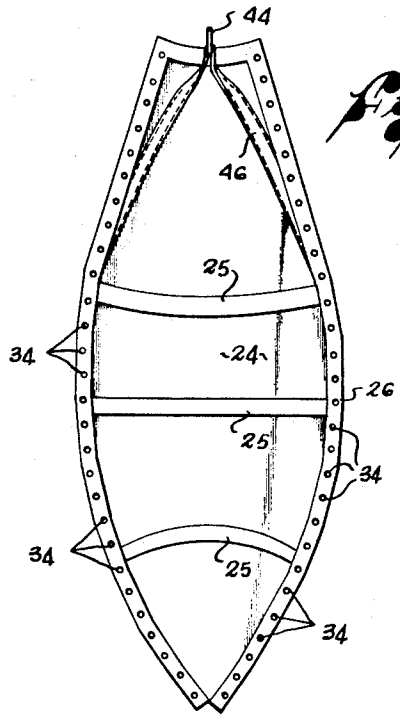


Fig. 6

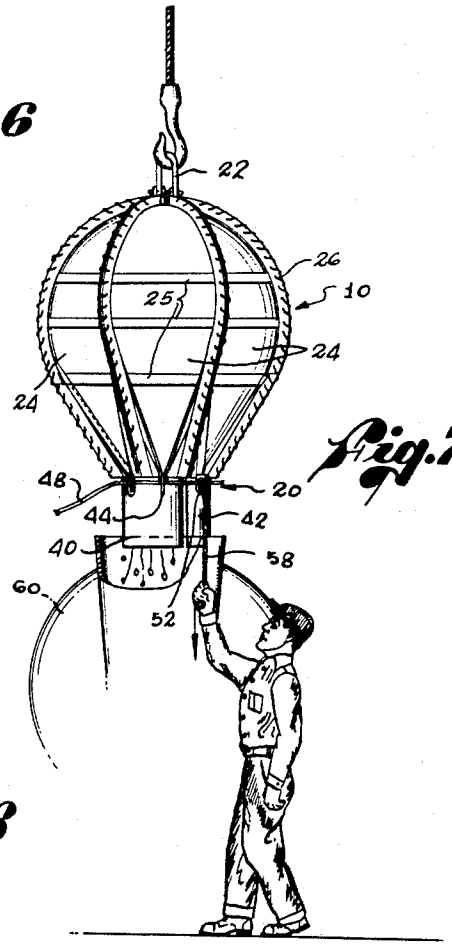


Fig. 7

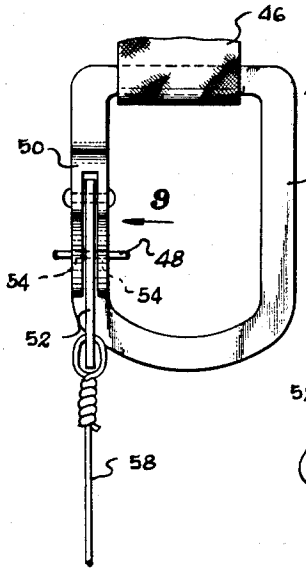


Fig. 8

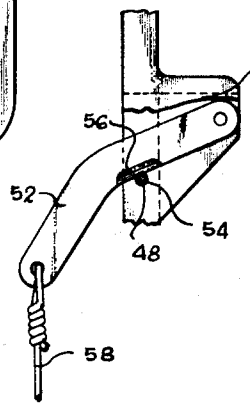


Fig. 9

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STABILIZED CONCRETE MIX AND METHOD OF USE THEREOF

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Filed Dec. 30, 1957, Ser. No. 706,053
22 Claims. (Cl. 206—47)

The present invention relates generally to packaging concrete and more particularly to a package of stabilized concrete mix ingredients utilizing a novel container, and a method of use therefor.

It is common practice in the construction industry to use power methods of mixing concrete in order to avoid high labor costs. As a result of this practice, an extremely high investment in capital equipment is required. In order to efficiently utilize this equipment, it is desirable to closely coordinate its movement during delivery and pouring of the concrete to avoid any idleness of the machinery and labor involved.

For example, the delivery of concrete by transit mix trucks, delivery time is the essence of efficient, economical operation from the standpoint of the concrete user, particularly in large projects. Any delay in delivery results in enforced idleness of the machinery and labor of the user with consequent financial loss. Furthermore, concrete users typically demand delivery of transit mix concrete early in the day to utilize daylight for the pouring operation. These and other factors must be taken into consideration because of the unstable nature of the wet batch concrete so that the entire operation must be closely scheduled and coordinated.

Many of the demands of the user are inconsistent with efficient use of equipment by the transit mix supplier. His trucks are tightly scheduled and he must have enough trucks to meet the peak demand of the early part of the day. In the slack parts of the day much of the supplier's equipment, including the batching plant and trucks, is idle and unproductive.

Similar problems are involved in the dry batch method of laying concrete. This method also involves the timing and coordination of many pieces of rolling equipment in delivering the dry batch for mixing at the site. Additionally, both of these methods share the disadvantage that they do not afford as close a control over the quality of the final product as is desirable. Modern concrete mixing is an art, best practiced at a central batching plant where materials can be carefully chosen for their adaptability to the specific purpose for which the concrete is to be used so that the finished installation will conform exactly to specifications, no matter how large it is. It is well known that the portion of water in the batch can be critical, but in both the transit mix and dry batch methods the control of the total moisture content of the batch is crude.

Conventional methods of handling concrete also make it difficult to fix responsibility for the structural characteristics of the final installation. Even though devices are commercially available for determining the moisture content of the fine and coarse aggregates to be used in a batch so that the correct amount of water to be added for a desired result can be deduced, there can be no assurance that the wet batch at the time of pouring will have the desired total moisture content to meet a predetermined specification. Too many persons have, and take, an opportunity to alter the moisture content of a batch, each according to his own judgment and, more often than not, with regard to ease of handling rather than in consideration of structural characteristics. Recognizing this, architects, engineers and building codes specify greatly

overdesigned structures to compensate for this possibility of human error. It has heretofore been impractical for any of the persons involved to assure that any desired volume of concrete will all conform to a slump test of a desired consistency of concrete because of the factors mentioned above.

An important object of my invention is to provide a method of concrete construction in which the total moisture content of the concrete can be easily and carefully controlled whereby any desired specification therefor can be assured.

Another object of my invention is to provide a method of concrete construction utilizing packages of proportioned concrete mix ingredients of any desired specification in stable form that can be prepared and delivered well in advance to the construction site in readiness for mixing at any time at the will of the user. The necessity of scheduling and coordinating the movements of many pieces of rolling equipment, such as transit mixers or dry batch trucks, is thus eliminated and the cost of concrete construction is accordingly reduced.

Another object of the invention is to provide a package of a proportioned concrete mix in stable form that can be readily transported and stored, the package containing a compartment of binder material or cement and a compartment of filler material or aggregate in any desired ratio and the aggregate having a stabilized moisture content, in the form of either moisture absorbed and entrained in the sand and gravel or as added water. Any number of packages conforming to a desired specification can be exactly duplicated at a batching plant for transportation to a construction site at any convenient time, the use of such packages insuring that the resulting installation will have uniform structural characteristics conforming exactly to the desired specification. These packages have the further advantage that they can be delivered to remote locations which are inaccessible to rolling equipment, the utility of the packages increasing with the distance of the construction site from the batching plant.

A further object of the invention is to provide a container adapted for the transportation and storage of a moisture stabilized aggregate that will maintain a desired ratio of sand, gravel, and moisture comprising the aggregate.

Yet another object of the present invention is to provide a container for a proportioned stable concrete mix having a cement compartment and a moisture-proof aggregate compartment adapted for substantially concurrent discharge of their contents into a mixing apparatus in such a way that the aggregate and cement tend to mix or commingle during their fall from the container.

The invention also has for an object thereof the provision of a container for stabilized concrete mix that is of a particularly rugged construction and long service life, the container for this purpose comprising a plurality of interchangeable and replaceable fabric panels arranged to define a bag of plural compartments.

Another object of the invention is to provide a dual compartment container having means to releasably close the compartment mouths for substantially simultaneous opening, the release mechanism being remotely controllable.

These and other objects and advantages of my invention will be apparent from the following description thereof when taken in conjunction with the annexed drawing showing a presently preferred embodiment of a container for use with my invention.

FIGURE 1 is an elevational view of a presently preferred embodiment of a container for use with the invention;

FIGURE 2 is a partial elevational view on a reduced

scale showing the appearance of the mouth of the container in FIGURE 1 when closed;

FIGURE 3 is a transverse sectional view taken along the line 3—3 of FIGURE 1;

FIGURE 3*a* is a partial sectional view of the area 3*a* of FIGURE 3 and particularly showing the manner of supporting a seam of the moisture-proof liner of the aggregate compartment on a seam of the partition wall of the container;

FIGURE 4 is a fragmentary elevational view of the mouth end of the container of FIGURE 1 and particularly showing the manner in which the upper end rings are connected to the container;

FIGURE 5 is a partial sectional view on an enlarged scale of the area 5 of FIGURE 3 and particularly showing the seam construction and manner of connection of the container and liner;

FIGURE 6 is a plan view on an enlarged scale of one of the replaceable panels of the container of FIGURE 1;

FIGURE 7 is an elevational view on reduced scale showing the container of FIGURE 1 in use;

FIGURE 8 is an elevational view on an enlarged scale of a portion of the bag-closing means; and

FIGURE 9 is a side view taken in the direction of the arrow 9 of FIGURE 8 showing details of the bag release means.

In carrying out the invention I provide an aggregate of sand and gravel or any other aggregate ingredients whose moisture content is stabilized by packaging the aggregate in a moisture-proof container. The sand, gravel and moisture are proportioned to any desired specification for mixing with a desired proportion of cementitious material. For convenience of use, the aggregate and cement are put up in a single package which provides a moisture-proof, sealable compartment for the aggregate and a separate compartment for the cement, the compartments being adapted to gravitationally discharge through separate adjacent mouths when the container is suspended in inverted position.

A container **10** of the foregoing type is shown in the drawings and preferably takes the form of a fabric bag of truncated substantially ovoid configuration that opens upwardly to the apex end of the bag. An interior partition **12** divides container **10** into a cement compartment **14** and an aggregate compartment **16** both of which can be filled and emptied through the mouth of container **10**. The aggregate compartment **16** is provided with a waterproof liner **18** and a mechanical means **20** is provided to close the container **10** whereby any penetration or loss of moisture into or from the aggregate chamber **16** is prevented and cement compartment **14** is closed to the entrance of any foreign material. Means **20** also serves to permit lifting of the container **10** and a ring **22** at the opposite or bottom end of container **10** permits the container to be suspended in inverted position to gravitationally discharge its contents.

Container **10** is made up, in part, of a plurality of fabric panels **24**, one of which is shown in FIGURE 6. These panels are preferably made of a tightly woven nylon fabric that is impregnated with a vinyl plastic material in order to reinforce the fabric for successfully resisting wear due primarily to abrasion. A long service life for the container is thus achieved and the impregnation also serves to waterproof the fabric to prevent penetration of moisture through panels **24** into the completed container **10**.

Each of the panels **24** is generally elliptical in shape and the edges thereof are bound with a nylon tape material **26**. The taped longitudinal edges of the panel **24** have affixed thereto at spaced intervals therealong a plurality of grommets **34** defining apertures for the reception of suitable lacing means and a plurality of transversely extending reinforcing bands **25**, also of a nylon tape material, are stitched or otherwise secured to panel **24**.

The liner **18** is made up of a plurality of identical panels **28** of a rubber-like material that is impervious to the passage of moisture. These panels **28** are also of generally elliptical configuration, but are somewhat longer than the fabric panels **24**, having substantially rectangular continuations formed therein at the upper end of each panel. While the fabric panels **24** are removably interconnected, the liner panels **28** are assembled into an integral unit by vulcanizing the panels together along adjacent longitudinal edges thereof. The vulcanized seams of liner **18** are provided with grommets **32** at spaced intervals therealong adapted to register with the grommets **34** of the taped edges of fabric panels **24**.

Referring now to FIGURE 3, it will be observed that container **10** is illustrated as being made up of eight of the fabric panels **24** and a liner **18** comprising six of the rubberlike panels **28**. The exterior of container **10** is defined by six of the fabric panels **24**, the other two fabric panels, indicated particularly by the reference characters **24***a* are interiorly disposed within the container. The aggregate compartment **16** is accordingly defined by the two interior fabric panels **24***a* and four exterior fabric panels **24**, and in like manner the cement compartment **14** is defined by the two interior fabric panels **24***a* and the remaining two fabric panels **24**. The liner **18** is disposed in aggregate compartment **16** with the vulcanized seams thereof sandwiched between adjacent edges of the outer fabric panels **24** while one vulcanized seam of liner **18** lies alongside the seam common to the two interior fabric panels **24***a*. All of the adjoining seams and edges of the fabric panels and liner **18** are then tightly tied together by suitable lacing **36**, preferably of a nylon material which is threaded through the aligned grommets **32** and **34**, as is shown in detail in FIGURE 5 and generally in FIGURE 1.

In FIGURE 3 the partition **12** is indicated as being somewhat centrally disposed so that the capacity of cement compartment **14** is approximately one-third the capacity of container **10** and the capacity of aggregate compartment **16** is approximately two-thirds of the total capacity of container **10**. It will be apparent that although this condition as depicted in FIGURE 3 represents the maximum capacity of the cement compartment **14**, it by no means is representative of the maximum capacity of aggregate compartment **16**. The several panels defining the partition **12** being similar in configuration to the outer panels **24** are thus adapted to overlie the outer panels included in cement compartment **14**, when the compartment **14** is empty so that substantially the entire capacity of container **10** can be utilized for packaging aggregate.

The two interior fabric panels **24***a* and the two exterior panels **24** which define the cement compartment **14**, in addition to being laced together along adjacent edges, are closely stitched together along the seams thereof in a manner to prevent any sifting of cement through these seams. In this connection it will be observed that all of these seams are inverted relative to the interior of cement compartment **14** to avoid such penetration of the cement into the seams. The vulcanized seams of the liner **18** are also inverted relative to the interior of aggregate compartment **16** so that the seam edges of the panels **28** will not be abraded by the action of the aggregate. Both of these seam arrangements are particularly illustrated in FIGURE 3*a*.

When the fabric panels **24** have been assembled with the liner **18** disposed in aggregate compartment **16**, a fabric collar **38** is stitched to the upper edges of the panels **24** as shown in FIGURE 1 to define a mouth of container **10** which circularly encompasses a mouth **40** of liner **18** and a mouth **42** of cement compartment **14**. The mouth **40** is defined by the aforementioned integral continuations of the material of the liner panels **28**, also vulcanized together along adjacent edges to define a tubular passage for the aggregate. The mouth **42** of cement compartment **14** may conveniently be made of the same material as panels **24** stitched to the collar **38** and panels **24***a* to define a foldable flap closure for the compartment **14**. The mouth **40** of liner **18** is of sufficient length to be

rolled over upon itself to define a fluid-tight seal for the liner **18**. Both mouths **40** and **42**, when folded over, are stuffed down into the collar **38**, which in turn may be folded over the mouths **40** and **42**.

In order to maintain the compartment mouths **40** and **42** in closed condition, the container opening is tightly drawn together in the manner depicted in FIGURE 2. For this purpose each of the fabric panels **24** in its upper end is provided with an eye member **44** held in place by the bight of a webbing **46** securely stitched to the panel **24**. A length of wire **48** is threaded through all of the eye members **44** and drawn into a tight loop and knotted to prevent opening of container **10**.

The ring **22** at the lower end of container **10**, by means of which container **10** can be supported in an inverted position, is fastened to the container by threading all of the lacing **36** therethrough. When container **10** is thus suspended as indicated in FIGURE 7, its contents can be discharged by cutting of the wire **48** by means of the device best seen in FIGURES 8 and 9.

One of the eye members **44** has rigidly affixed thereto, as by welding, a bifurcated member **50** that pivotally supports a cutter member **52** between the arms thereof. Aligned bores **54** are formed in the arms of the bifurcated member to receive therethrough the wire **48**. The free end of the cutter member **52** is provided with a lanyard or cord **58** that can be manually pulled as indicated in FIGURE 7 whereby a sharpened edge **56** of the cutter **52** severs the wire **48**, which under the weight of the concrete mix contained in the container **10** springs apart whereby the mouths **42** and **44** open downwardly to discharge the aggregate and cement into a mixing device **60** indicated in phantom outline in FIGURE 7.

In use, the package of stabilized concrete mix is prepared at a batching plant at which aggregate is placed in the compartment **16** and cement placed in the compartment **14**. Inasmuch as the partition **12** is movable, considerable leeway is provided for variable ratios of aggregate to cement.

Prior to its placement in container **10** the moisture content of the aggregate is carefully determined, taking into consideration both the absorbed moisture which will usually be found in the fine aggregate as well as the free moisture in excess of that absorbed by the aggregate particles. With this information the additional water to be added to the entire package of concrete mix can readily be determined and either added to the container **10** at the batching plant or added in the mixing device at the construction site. In either event the immediate sealing of the aggregate compartment **16** after its loading insures that an accurate control over the moisture content of the batch is achieved. Thus, if it is desired to add water on the job a suitable placard may be attached to container **10** indicating the proper amount of water to be added in the mixer with the contents of container **10** to achieve the desired specification.

Once the container **10** has been loaded and closed it may be stored and transported to the construction site at any convenient time well in advance of actual mixing time without any danger that the character of its contents will be changed by loss of moisture through evaporation from the aggregate or the absorption of any moisture from any source external to container **10**. At the site the container **10** may be inverted by connecting any suitable crane hook to the ring **22** and the contents discharged by pulling on the cord **58**. The contents will then discharge through the mouths **40** and **42** to achieve ribbon feeding of aggregate and cement in suitable proportions, the aggregate and cement tending to commingle or intermix as they fall into the mixer hopper.

While I have herein shown and described a preferred embodiment container for the practice of my invention, it will be evident to those skilled in the art that my method and apparatus are susceptible of variations and changes in accordance with the principles set forth herein and the claims annexed hereto.

I claim:

1. A package of a moisture stabilized aggregate for use in making concrete comprising: a predetermined amount of sand; and gravel wetted by a predetermined amount of water; and a container made of a pliable waterproof material enclosing said sand, gravel, and water and having means through which said aggregate of sand, gravel and water can be introduced and evacuated, said container when said means is closed defining a moisture-proof enclosure whereby a predetermined ratio of sand, gravel, and water is maintained.

2. A package of moisture stabilized aggregate for use in making concrete comprising: a predetermined amount of sand; a predetermined amount of gravel; a predetermined amount of water wetting said sand and gravel; a reusable collapsible container made of a flexible material adapted to resist abrasion by aggregate for enclosing aggregate comprising said sand, gravel, and water and having an opening for the introduction and discharge of said aggregate; means associated with said container to prevent the passage of moisture through said container; means for selectively closing said container opening to completely surround said aggregate and to define with said first-mentioned means a complete moisture-proof enclosure for said aggregate to preserve a predetermined ratio of said sand, gravel, and water; and means on said container for suspending said package in manipulating it to discharge said aggregate when said container is opened.

3. A package of a moisture stabilized aggregate for use in making concrete comprising: a predetermined amount of sand; a predetermined amount of gravel; a predetermined amount of water; a reusable container made of a pliable material for transportably supporting said aggregate; a liner for said container made of a pliable material adapted to withstand abrasion by said sand and gravel and impermeable to the passage of moisture and having a closeable mouth coincident with an opening of said container through which aggregate comprising said sand, gravel and water can be introduced and discharged, said mouth when closed making of said container and liner a moisture-proof enclosure to maintain a predetermined ratio of sand, gravel, and water during transportation and storage of said aggregate; and means on said container to secure a purchase on said package for manipulating it during discharging thereof.

4. A package for use in making concrete comprising: a predetermined amount of an aggregate material of predetermined moisture content; a predetermined amount of a cementitious material; and transportable container means releasably enclosing said materials in adjacent waterproof compartments for substantially concurrent discharge when adjacent mouths formed in said compartments are opened.

5. A package of a preproportioned, stabilized concrete mix comprising: a predetermined amount of an aggregate of sand, gravel, and moisture in a predetermined ratio; a predetermined amount of cement; a waterproof compartment releasably enclosing said aggregate that when closed is impermeable to the passage of moisture to preserve said predetermined ratio; a compartment releasably enclosing said cement; means interconnecting said compartments in single package relationship for storage and transportation as a unit with selectively closable discharge openings formed in said compartments and disposed adjacent one another; and means on said package to suspend said compartments for substantially concurrent discharge of their contents through their adjacent openings whereby said aggregate and cement tend to commingle during discharge.

6. A preproportioned, concrete mix comprising: a predetermined amount of an aggregate of sand, gravel, and moisture in a predetermined ratio; a predetermined

amount of cement; a resuable collapsible container made of a flexible material having an interior partition dividing said container into an aggregate compartment and a cement compartment enclosing said aggregate and cement respectively, said partition defining a mouth for said aggregate compartment and a mouth for said cement compartment with an opening of said container; a pliable liner for said aggregate compartment that is impermeable to the passage of moisture and adapted to withstand abrading and puncturing by said aggregate; means for releasably closing the mouth of said cement compartment; means for releasably closing the mouth of said aggregate compartment that when closed defines with said liner a moisture-proof enclosure for said aggregate to maintain a predetermined ratio of sand, gravel, and moisture during transportation and storage of said package; and means on said container by which it can be manipulated to gravitationally discharge said aggregate and cement from the adjacent mouths of said compartments.

7. A container for a stabilized concrete mix comprising: a collapsible upwardly opening bag of a material adapted to withstand abrasion by an aggregate including gravel and to prevent bursting of said bag when containing aggregate and dropped, and including a partition in said bag dividing the interior thereof into a cement compartment and an aggregate compartment, both of which can be loaded and unloaded through the opening of said bag; means associated with said aggregate compartment to prevent the escape of moisture therefrom when said bag is closed whereby to preserve a predetermined moisture content of aggregate contained therein; releasable means for closing the opening of said bag; means for releasing said last-mentioned means from a position remote from said bag opening and means to suspend said bag in inverted position to gravitationally discharge the contents of said compartments when said bag-closing means is released.

8. A concrete mix container comprising: a collapsible upwardly-opening bag of a pliable waterproof fabric material; a partition in said bag dividing the interior thereof into a cement compartment and an aggregate compartment, both of which can be loaded and unloaded with cement and aggregate respectively through the opening of said bag; a moisture-proof liner in said aggregate compartment having a mouth portion in said bag opening that can be releasably closed to preserve the moisture content of aggregate contained therein and made of an elastomeric material adapted to withstand abrasion by said aggregate, said liner and bag being adapted to prevent bursting thereof in response to dynamic and static stresses imposed thereon by cement and aggregate contained therein; means for releasably closing the mouth of said cement compartment for completely enclosing cement contained therein; means for releasably closing the opening of said bag that maintains the mouth of said liner and the mouth of said cement compartment in fluid-sealed closed condition and that can be released from a position remote from said bag; and means to suspend said bag in inverted position to gravitationally discharge the contents of said compartments when said bag-closing means is released.

9. A reusable concrete mix container comprising: a collapsible bag of substantially ovoid configuration made of a flexible waterproof material having a truncated apex portion defining an upwardly opening end of said bag; a partition in said bag made of a flexible material to define a pair of expandable compartments of said bag to accommodate variable proportions of aggregate and cement, said partition dividing the opening in the upper end of said bag into mouths for each of said compartments; a liner of a moisture-proof sheet material and made of an elastomeric material adapted to withstand abrasion by said aggregate, said liner and bag being adapted to prevent bursting thereof in response to dynamic and static stresses imposed thereon by cement and aggregate contained therein in one of said compartments having a tubular mouth portion extending upwardly through the mouth of said compartment that can be folded to completely close said liner whereby the moisture content of aggregate contained therein is maintained constant; at least one flap of flexible material for closing the mouth of the other of said compartments to prevent any loss of cement contained therein; means for releasably drawing together the edge of said bag opening to maintain the mouth of said liner and said flap in compartment closing position; and means by which to support said bag for gravitational discharge of its contents when said compartments are opened.

10. A device as set forth in claim 9 in which said bag and partition are made of a plurality of identical panels of said material secured to one another along the longitudinally extending margins thereof, said partition comprising a plurality of said panels adapted for selective movement to contacting superposition on a plurality of panels of said bag so that an empty one of said compartments can be collapsed.

11. A device as set forth in claim 9 in which said liner is made of a plurality of identical panels of said material secured to one another along the longitudinally extending margins thereof, the marginal seams of said panels of said liner and of said bag and partition being inverted relative to said compartments to prevent damage thereto from the contents of said compartments.

12. A concrete mix container comprising: a bag of substantially ovoid configuration made of a plurality of identical fabric panels secured to one another along longitudinally extending margins thereof, said bag opening upwardly through a truncated apex portion thereof; a partition in said bag made of at least one of said panels to define a pair of compartments in said bag, said partition dividing the opening of said bag into a mouth for each of said compartments; a liner in one of said compartments made of a plurality of panels of a rubber-like material vulcanized together along the longitudinally extending edges thereof and having a tubular mouth portion extending upwardly through the mouth of said compartment that can be folded to completely close said liner whereby the moisture content of aggregate contained therein is maintained constant; at least one flap of a flexible material for closing the mouth of the other of said compartments to prevent any loss of cement contained therein; a ring secured to the upper edge of each of said bag panels whereby a wire can be passed through said rings to draw together the edges of said panels defining the opening of said bag to maintain the mouth of said liner and said flap in compartment closing position when said wire is tied; means from which to suspend said bag in inverted position in order to discharge its contents for mixing; and cutter means on one of said rings to shear said wire to permit opening of said bag and its compartments to gravitationally discharge the contents of said bag.

13. A device as set forth in claim 12 in which said bag panels are secured to one another along their margins by laces, said laces also intercepting suitable apertures formed in the margins of said liner panels to support said liner in one of said compartments.

14. In the process of concrete construction the steps of segregating an aggregate comprising coarse and fine aggregates in a predetermined ratio, measuring the moisture content of said aggregate and maintaining said moisture content constant until the use of said aggregate.

15. In the process of concrete construction that includes the steps of segregating a quantity of an aggregate material, measuring the quantity of free and absorbed moisture in said segregated aggregate material, adding to said segregated aggregate material an additional quantity of moisture to provide the balance of moisture needed to achieve a desired ratio of aggregate

and moisture and maintaining the total moisture content of said segregated aggregate constant until use of said aggregate and moisture.

16. In the process of making concrete at a point remote from the source of the ingredients thereof the steps of segregating in portable compartments predetermined portions of aggregate and cement, said aggregate having a predetermined amount of moisture therein; closing and transporting said compartments to said remote point without substantial loss of said moisture, and emptying and commingling the contents of said compartments into a mixer while adding such water as may be required.

17. The process of making concrete as defined in claim 16 in which the aggregate and cement are separated in said compartments during transportation in a common container, and said commingling is accomplished by causing the aggregate and cement to flow in juxtaposition from the same end of said container.

18. In the process of making concrete at a point remote from the source of the ingredients thereof the steps of segregating a predetermined portion of aggregate with a predetermined moisture content; transporting said portion to said remote point; controlling said moisture content during said transportation and until the time of use of said portion; and thereafter mixing said aggregate with proper amount of other ingredients to produce concrete of the requisite characteristics.

19. In the process of making a batch of concrete at a point remote from the source of the ingredients thereof the steps of measuring the moisture content of the aggregate portion of said batch and sealing said aggregate portion against any appreciable change in moisture content in the interim between said measurement and the introduction of said portion into a mixer into which the other ingredients of said batch to produce concrete of the desired characteristics are also introduced.

20. In the process of making a batch of concrete at a point remote from the source of the ingredients thereof the steps of measuring the moisture content of the aggregate portion of said batch, sealing said aggregate portion against any appreciable change in moisture content in the interim between said measurement and the introduction of said portion into a mixer, packaging said sealed aggregate portion in a common container with the cement portion of said batch, and substantially hermetically sealing said package to protect its contents until introduction into said mixer into which the other ingredients of said batch are also introduced to produce concrete of the desired characteristics.

21. In the process of making a batch of concrete at a point remote from the source of the ingredients thereof the steps of measuring the moisture content of the aggregate portion of said batch, adding sufficient water to said aggregate portion to supply the total water requirement of said batch, and sealing said aggregate portion and water against any appreciable change in ratio in the interim between said addition of water and the introduction of said aggregate portion and water into a mixer into which other ingredients of said batch to produce concrete of the desired characteristics are also introduced.

22. An article of manufacture comprising predetermined segregated portions of a moist aggregate and cement in a waterproof package that is interiorly divided into waterproof compartments to prevent said portion of cement segregated in one compartment from hygroscopically absorbing moisture from said portion of aggregate segregated in the other compartment until said package is opened.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,018,880 January 30, 1962

John B. Brugmann

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 6, after "sand" strike out the semicolon; line 18, after "reusable" insert a comma; column 7, line 35, after "opening" insert a semicolon.

Signed and sealed this 5th day of June 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents