Title: FLOATING PARTITION, LOFT AND TROUGHS FOR A LIVESTOCK SHIPPING CONTAINER

Abstract: A shipping container for livestock having a plurality of walls, a container roof and a container floor enclosing an interior storage space. The front wall may include a container door and one or more of the sidewalls may be mounted with one or more column support plates that support web support plates. A floating partition, end wing, loft and feed troughs may be mounted with the web support plates. Additionally, the floating partition may be tilted inward to efficiently divide space and provide access to the loft. A catwalk may also be mounted with the floating partition.
FLOATING PARTITION, LOFT AND TROUGHS FOR A LIVESTOCK SHIPPING CONTAINER

FIELD OF INVENTION

Generally, embodiments described herein relate to shipping containers for transporting livestock on shipping vessels, and more particularly relate to shipping containers having floating partitions, as well as, floating feed troughs and lofts.

BACKGROUND

As beef, dairy and other livestock industries continue to develop around the world; various market demands generate a need to transport livestock over great distances. In some cases, transoceanic and intercontinental shipments may be desirable. These shipments can be made relatively quickly by airborne transport, but at a great expense. Heavier cargo, such as livestock, can be particularly expensive creating a need for waterborne transport, which can take between four days and forty-five days, or more, to arrive at a final destination. Living animals present a number of issues that are unique to shipping and which become increasingly problematic over extended shipment periods. Therefore, a need exists for a specialized shipping container for the oceanic transport of livestock.

At least one previous container indicated for the transport of livestock provides an external means for accessing stored feed for distribution to livestock within the container. Such an arrangement may present safety hazards to an operator and requires additional spacing between containers. For example, some previously described shipping containers include compartments which are accessible from the exterior of the container through outwardly opening panels. These panels require a certain clearance in order to provide access to feed during the course of shipment, which increases the required space for each container. Further, these configurations require an operator or attendant located on the exterior of the container for distributing feed. The attendant may be exposed to weather elements and may be within the reach of livestock presenting opportunities for injury while performing these tasks. As such, a further need exists for shipping containers which are
spatially efficient and which include features for enhancing the health and safety of livestock and attendants.

A feed partition has been previously described which is located on the interior of a shipping container. However, the described design requires a large amount of metal that adds significantly to the overall weight of the container. Additionally, the partition extends to the floor presenting a number of issues. In particular, a permanent structure affixed to the floor of a shipping container may be difficult to clean between shipments as waste may collect at crevasses and joints and become resistant to conventional washing. Cleaning shipping containers between shipments is important to the health and safety of both animals being transported and personnel in contact with the containers. Therefore, a need exists for a shipping container with improved sanitary features.

SUMMARY OF INVENTION

Certain embodiments of the claimed invention are summarized below which meet the needs set forth above. These embodiments are not intended to limit the scope of the claimed invention, but rather serve as brief descriptions of possible forms of the invention. The invention may encompass a variety of forms which differ from these summaries.

One embodiment relates to a shipping container having a front wall, back wall, first sidewall and second sidewall connecting a container roof to a container floor enclosing an interior storage space. A floating partition may be mounted with one or more of the first and second sidewalls separating the interior storage space into a first portion and a second portion without touching the container floor. A loft may also be connected to the floating partition and mounted with one or more of the first and second sidewalls.

Another embodiment relates to a shipping container having a front wall, back wall, first sidewall and second sidewall connecting a container roof to a container floor enclosing an interior storage space. One or more column support plates mounted with the first sidewall and one or more web support plates mounted at the column support plates at the first sidewall. The one or more web support plates may have distal ends extending away from the column support plates mounted at the first sidewall. A floating partition may be mounted with the web support plates. One or more feed troughs and a catwalk may be
mounted with the floating partition. A loft in communication with the floating partition may be supported by one or more of the plurality of sidewalls. An end wing may be connected to the floating partition.

Naturally, further objects of the invention are disclosed throughout other areas of the specification and drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1A illustrates a downward sectional view of the front portion of a shipping container in accordance with certain embodiments described herein, the sectional view being taken from above the loft.

FIG. 1B illustrates a downward sectional view of the back portion of a shipping container in accordance with certain embodiments described herein, the sectional view being taken from above the loft.

FIG. 2A illustrates a downward sectional view of the front of a shipping container in accordance with certain embodiments described herein, the sectional view being taken from above the feed troughs.

FIG. 2B illustrates a downward sectional view of the back of a shipping container in accordance with certain embodiments described herein, the sectional view being taken from above the feed troughs.

FIG. 3 illustrates a back sectional view of a shipping container in accordance with certain embodiments described herein, the sectional view being taken from in front of the wing end.

FIG. 4 illustrates a back sectional view of a shipping container in accordance with certain embodiments described herein, the sectional view being taken at a ventilation opening.

FIG. 5 illustrates a perspective view of a portion of the interior of a shipping container and a floating partition in accordance with certain embodiments described herein.

While the present invention may be embodied with various modifications and alternative forms, specific embodiments are illustrated in the figures and described herein by way of illustrative examples. It should be understood the figures and detailed descriptions
are not intended to limit the scope of the invention to the particular form disclosed, but that all modifications, alternatives, and equivalents falling within the spirit and scope of the claims are intended to be covered.

5 MODES FOR CARRYING OUT THE INVENTION

Now referring primarily to FIGS. 1A and 1B, a downward sectional view of a shipping container 10 having a plurality of walls 16 is illustrated from above a loft 32. In FIG. 1A a front end of the shipping container 10 is shown with a front wall 18 consisting of a container door 26. The shipping container 10 and a container door 26 can represent any conventional shipping container and may incorporate any number of doors without departing from the scope of the invention contemplated herein. By way of a non-limiting example, the shipping container 10 may be 8 feet wide, 40 foot long and 9 and a half feet tall. As additional non-limiting examples, similar containers with metric dimensions, containers with less height, containers with less length, containers with more height, and containers with more length may also be used, so long as the container has an interior storage space 30 sufficient for transporting livestock.

The interior storage space 30 may be divided into a first portion 66 (seen in FIG. 3) and a second portion 68 (also seen in FIG. 3) by the combination of a floating partition 28, loft 32 and wing end 134, each of which may be constructed, in large part, from tubular metal, such as tubular steel. Naturally, other construction materials of requisite strength may also be used. In the case of transporting livestock, the first portion 68 of the interior storage space 30 may be considered the livestock storage area 70 and may be so dimensioned to accommodate any of a number of livestock. For example, various national and international bodies require certain livestock to have specified amounts of area per animal for shipment. This area allocated to livestock may be considered the livestock storage area 70. The second portion 68 of the interior storage space 30 may be configured for the storage of feed or for access by various personnel and may be generally designated the feed storage area 72.

Each of a floating partition 28, loft 32 and wing end 134 may be supported by a first sidewall 22 and a second sidewall 24 without touching the container floor 14 (seen in FIG.
3). In this configuration each of the floating partition 28, loft 32 and wing end 134 may be considered to be "floating." As used herein with respect to internal container elements, the term "floating" shall be construed as not touching the container floor. Such a configuration may provide numerous advantages. For example, large livestock animals, such as cattle, may produce a significant volume of waste throughout the period of transport. Various human and livestock health issues arising from the collection of this waste may require that shipping containers utilized for shipping livestock are cleaned once the animals are discharged. Even with pressure washers, it may be difficult to thoroughly clean the interior surface of a container various items are connected directly to the floor. The floating configuration described herein provides an advantage over other pens or partitions contemplated on the interior of a shipping container because the container floor is free of obstacles or crevasses which may collect waste, or prevent waste from being washed out even with a pressurized washer.

Further advantages exist in a floating partition, particularly in transatlantic voyages, where livestock may be prone to injure their legs or other body parts on pen or support structures attached to the container floor. In particular, in the case of shipping containers on shipping vessels, large animals, such as cattle, may damage structures affixed to the container floor.

The combination of the floating partition 28, loft 32 and wing end 134 may provide an internal structure which provides a safe isolated space for livestock in addition to an accessible storage area for feed. Personnel may access the feed and distribute it to a feed trough 48 (illustrated in FIGS. 2-5) accessible to the livestock, while remaining physically separated from the livestock. The loft 32 may provide an area for storing hay, compressed hay, bags of grain, or pellets of feed above the livestock storage area 70 in a manner which is inaccessible to the livestock. The end wing 134 is connected to the floating partition 28 and in combination they may provide a vertical barrier along the entire length of the container 10, or perhaps along the majority of the length of the container 10. This vertical barrier serves to isolate personnel from livestock, as personal may periodically access feed and for distribution into feed troughs. In this manner feed is accessible to be distributed evenly amongst troughs spaced along the entire length of the container 10. Personnel may
access this feed storage space 68 through a personnel door 146 which may itself be located in the container door 26 of the front wall 18.

The wing end 134 may provide a widened space in the feed storage area 68 allowing space for the personnel door 146 to swing open and providing more room for access to various items and features within the container 10. The winged end 134 may include a wing gate frame 136 hinged to the floating partition 28. When in use, the container doors 26 will be closed and the winged gate may be latched in a position near or touching the front wall 18 of the container 10. The wing gate 134 may further include wing gate stanchions 138 in the form of vertical posts affixed within the wing gate frame 136. The wing gate 134 may further include wing gate cross members 140. The wing gate cross members 140 may serve as ladder steps 142 providing access to a loft floor 98 located a top the loft 32. The wing gate 134 may be constructed at a slight tilt in order to present ladder steps 140 in a more user friendly configuration.

When the container door 26 is opened, the wing gate 134 may be swung into a second position which may be viewed as a continuation of the feed partition structure 28. In this configuration, the wing gate 134 may extend beyond the border of the front wall 18. This configuration of the wing gate 134 provides for a significantly wider clearance when the container door 26 is open and may be particularly advantageous for loading livestock into the container 10 prior to shipment. This configuration may also be advantageous for cleaning the container 10 and for brining equipment into the container 10 for cleaning, such as after livestock are unloaded from the container after shipment.

The wing gate 134 may be supported entirely by the floating partition 28 without any portions extending to the container floor 14 (illustrated in FIGS. 3 and 4) and may thus be considered to be floating.

Column support plates 34 (seen best in FIG. 5) may be welded to the interior of the first sidewall 22 and the second sidewall 24 of the container 10, or affixed by some other means, such as an epoxy adhesive or with fasteners, such as bolts. Some shipping containers are constructed with corrugated steel walls, and the column support plate 34 may be wide enough to span across a portion of the surface to contact and be welded to at least two surfaces generally in the same plane. However, other materials are contemplated for
use herein, the width of the column support plates 34 may be selected as appropriate for the material of the column support plate and the container sidewall. The column support plates 34 may run the entire interior height of the container 10 and hence may contact the container floor 14 and the container roof 12 but are not considered part of the floating partition 28.

Web support plates 36 can be steel plates mounted on the column support plates 34 for the purpose of supporting the floating partition 28, troughs 48, a catwalk (Seen in FIG. 3, 4, and 5) and other structures above the container floor 14. As one non-limiting example, each of the column support plates 34 and the web support plates 36 may be constructed from pieces of quarter inch plate steel. However, other materials and thicknesses of requisite strength will be readily apparent for mounting the described structure and these materials and thicknesses are also contemplated for use herein.

The floating partition 28 may be mounted at a plurality of floating partition columns 60 which may be welded directly to the web plate supports 36. The floating partition columns 60 may be connected to a plurality of floating partition cross members 82, including a top floating partition cross member 84 mounted at the top of each of a plurality of floating partition support columns 60 and a bottom floating partition cross member 86 (seen in FIGS. 2, 3, 4 and 5) having segments mounted between floating partition columns 60. Floating partition stanchions 54 may be mounted generally in parallel with the floating partition support columns 60 and may have first ends 56 mounted to the bottom floating partition cross member 86 and second ends 58 mounted to the top floating partition cross member 84. Similar structures may also be used that, for example, provide a generally planar partition structure having a top a bottom and columns, which may be constructed from tubular metals.

The illustrated embodiment further includes mid floating partition cross members 88 mounted in parallel across the floating partition support columns 60 and floating partition stanchions 54. These floating partition cross members 88 may provide access to the loft 32 from portions of the feed storage area 68.

The loft 32 may include a loft floor 98 generally supported by loft joists 92. The loft joists 92 may have firsts ends 94 supported at, or mounted with, the top floating partition cross member 84 of the floating partition 28 and second ends 96 mounted with a loft support
beam 90. The loft support beam 90 may be an L shaped bracket or other beam being counted to a plurality of spaced column support plates 34 on the second sidewall 24. Alternatively, the loft support beam 90 may be replaced with a series of independent support brackets for each loft joist 90. The loft floor 98 may further include cutouts 164 for the purposes of promoting air circulation throughout the shipping container 10.

To further promote air circulation, a first circulation spacing 152 may be seen between the front wall 18 and the loft 32. The first circulation spacing, in combination with a first ventilation fan 148, can help promote air circulation throughout the shipping container 10 and particularly promote air circulation above the loft 32. Referring to FIG. 1B, a second circulation spacing 154 is illustrated for the purpose of prompting air circulation above the loft in conjunction with a second ventilation fan 150 mounted with the back wall 20.

Each of the first circulation spacing 152 and the second circulation spacing 154 in combination with the first ventilation fan 148 and the second ventilation fan 150 provides for improved air flow. Otherwise, in shipping vessel transports utilizing water routes collection of moisture and/or condensation is possible in the loft area which may result in mold or in the spoliation of stored feed.

Referring to FIGS. 2A and 2B, further features may be seen from a top down sectional view taken from below the level of the catwalk 70. A water bowl mount 104 may be mounted either directly to a wall 16 of the container 10, or to one of the column support plates 34. A water bowl 100, such as an automated or actuated water bowl, maybe mounted at the water bowl mount 104 and supplied with a source of water.

Feed troughs 48 can also be seen with a water trough front 50 that overlaps the bottom floating partition cross member 86. A water trough back 52 may rest on the trough support beam 46. The feed troughs 48 may be constructed for a polymeric material, such as a rubber or plastic. Such a construction may be light, easy to clean and easy to remove from the container 10. It may be desirable to have feed troughs 48 which are easy to remove for the purpose of cleaning the feed trough as well as for cleaning the container 10.

Referring now to FIG. 3, a front sectional view of the container 10 interior is shown from the front wall more clearly demonstrating the floating nature of the depicted embodiment at each of the floating partition 28, loft 32 and end wing 134 are elevated from
the container floor 14. Additionally, the front view provides a view of an angle of tilt 170 created by a distal end 38 of the web plate support 36 and the floating partition column 60 which is mounted thereon. In one embodiment, the angle of tilt 170 may be between 2 and 20 degrees, in another embodiment the angle of tilt 170 may be between 5 and 15 degrees.

The angle of tilt 170 provides more space in the livestock storage area 70 at the floor level, where livestock need it the most. At the same time space in the feed storage area 68 is increased towards the loft floor 98 providing personnel retrieving feed more space to operate. Additionally, the combination of the tilt and the mid floating partition cross members 88 provide ladder steps for accessing feed located on the loft floor 98.

The end wing 134 can be seen in greater detail, as having an end wing frame 136 comprising four pieces of tubular metal forming a generally quadrilateral shape. End wing stanchions 138 may be mounted in parallel within the frame 136.

Additionally, a first catwalk beam 40 and a second catwalk beam 42 can be seen mounted atop the web support plates 36. Each support beam and the catwalk 44 may run the entire length of the floating partition 28. A water line 102 may additionally run along a U shaped tub, or within a tubular beam, of the first catwalk support 40. Feed 74 is also illustrated within the feed trough 48.

With reference to FIG. 4, a front section is taken from behind the end wing 134 including illustrating a ventilation opening 114a in the first sidewall 22 and a ventilation opening 114a in the second sidewall 24 at a ventilation frame 116a. The ventilation opening 114a in the first sidewall 22 includes a shutter 118a with a shutter cover 120a in a closed position 124 and the ventilation opening 118b with a shutter cover 120b in the second sidewall 24 is illustrated in the open position 126.

With reference to the open shutter 118b, a shutter link 122 can be seen connected to a ventilation link 128. The slidable relationship between these lings allows the shutter to be locked into a shut position and unlocked and opened.

Referring to FIG. 5, a perspective view illustrates selected features and more clearly differentiates the floating partition columns 60 from the floating partition stanchions 54. The floating partition columns 60 are attached at the web support plates 36, while the floating partition stanchions terminate at the bottom floating partition cross member 86.
The invention should be understood to include the following the following non-limiting aspects:

A1. A shipping container comprising: (a) a front wall, back wall, first sidewall and second sidewall connecting a container roof to a container floor enclosing an interior storage space, wherein the front wall further comprises a container door; (b) a floating partition mounted with one or more of the first and second sidewalls, wherein the floating partition separates the interior storage space into a first portion and a second portion without touching the container floor; and (c) a loft connected to the floating partition and mounted with one or more of the first and second sidewalls.

A2. A livestock shipping container comprising: (a) a front wall, a back wall, a first sidewall and a second sidewall connecting a container roof to a container floor enclosing an interior storage space, wherein the front wall further comprises a container door; (b) one or more column support plates mounted with the first sidewall; (c) one or more web support plates mounted at the column support plates at the first sidewall, the one or more web support plates having distal ends extending away from the column support plates mounted at the first sidewall; (d) a floating partition mounted with the web support plates; (e) one or more feed troughs mounted with the floating partition; (f) a catwalk mounted with the floating partition; (g) a loft in communication with the floating partition and supported by one or more of the plurality of sidewalls; and (h) an end wing connected to the floating partition.

A3. The shipping container as claimed in claim A1, further comprising: one or more column support plates connected to one or more of the first and second sidewalls.

A4. The shipping container as claimed in claim A2 or claim A3, further comprising: one or more ventilation openings in one or more of the walls.

A5. The shipping container as claimed in claim A4, wherein the ventilation openings are spaced so as not to interfere with the column support plates.

A6. The shipping container as claimed in claim A3, further comprising: one or more web support plates connected to, and extending from, one or more column support plates, the one or more web support plates each having a distal end extending away from the first sidewall.
A7. The shipping container as claimed in claim A2 or claim A6, further comprising: a trough removably mounted on one or more trough support beams, wherein the one or more trough support beams are connected to one or more web support plates.

A8. The shipping container as claimed in claim A7, wherein the floating partition further comprises a bottom floating partition cross member and wherein the trough further comprises a trough front end and a trough back end, and wherein the trough front is mounted with the bottom floating partition cross member and wherein the trough back is mounted with the trough support beam.

A9. The shipping container as claimed in claim A8, wherein the feed trough further comprises a polymeric material.

A10. The shipping container as claimed in claim A2 or claim A6, further comprising: a catwalk mounted with one or more catwalk support beams, wherein the catwalk support beams are connected to one or more web support plates.

A11. The shipping container as claimed in claim A2 or claim A6, wherein the floating partition further comprises a series of floating position columns, each floating position column having a first end in communication with a web support plate and a second end in communication with the loft.

A12. The shipping container as claimed in claim A11, wherein the floating partition further comprises one or more floating partition stanchions generally parallel to the floating partition columns and one or more floating partition cross beams generally perpendicular to the floating partition columns.

A13. The shipping container as claimed in claim A2 or claim A6, wherein the floating partition comprises one or more floating partition columns in communication with the one or more web support plates.

A14. The shipping container as claimed in claim A13, wherein the floating partition columns are mounted at an angle of tilt relative to a horizontal axis as defined by the walls of the container.

A15. The shipping container as claimed in claim A14, wherein the angle of tilt of the floating partition columns is between about 2 degrees and about 20 degrees off the horizontal axis, as defined by the walls.
A16. The shipping container as claimed in claim A14, wherein the angle of tilt of the floating partition columns is between about 5 degrees and about 15 degrees off the horizontal axis, as defined by the walls.

A17. The shipping container as claimed in claim A13, wherein the floating partition further comprises a plurality of floating partition cross members mounted with the floating partition, the floating partition cross members further comprising: (a) a top floating partition cross member mounted across the tops of the floating partition columns; (b) a bottom floating partition cross member mounted between each floating partition column; and (c) one or more mid floating partition cross members mounted between the top floating partition cross member and the bottom floating partition cross member so as to overlie one or more floating partition columns.

A18. The shipping container as claimed in claim A17, further comprising one or more floating partition stanchions, wherein each floating partition stanchions has a first end and a second end, and wherein the first ends of the floating partition stanchions are mounted to the top floating partition cross member and the second ends of the floating partition stanchions are mounted to the bottom floating partition cross members.

A19. The shipping container as claimed in any of claims A2 to A18, wherein the loft further comprises: (a) a loft support beam attached at one or more column support plates on the second sidewall; (b) one or more loft joists having first ends and second ends, the first ends being mounted on the top floating partition cross beam and the second end being mounted on the loft support beam; and (c) a loft floor mounted on the one or more joists, wherein the covering further comprises openings towards the second ends of the joists, the loft floor including cut out sections.

A20. The shipping container as claimed in claim A19, further comprising a rail mounted on a top surface of the loft floor.

A21. The shipping container as claimed in claim A19, wherein the loft floor further comprises cut away sections.

A22. The shipping container as claimed in any preceding claim, wherein the first portion of the interior storage space comprises a livestock storage area adapted to store and transport
livestock and wherein the second portion of the interior storage space comprises a feed
storage area adapted to store feed.
A23. The shipping container as claimed in claim A22, wherein the floating feed partition
provides a barrier through which livestock access feed stored in a trough.
A24. The shipping container as claimed in any preceding claim, further comprising at least
one movable gate and a plurality of sets of gate hinges mounted with the second sidewall
wherein the movable gate is moveable between each set of gate hinges.
A25. The shipping container as claimed in any preceding claim, further comprising a
water impermeable coating on the floor of the container.
A26. The shipping container as claimed in claim A25, wherein the water impermeable
coating comprises an epoxy coating.
A27. The shipping container as claimed in any preceding claim, further comprising an end
wing mounted with the floating partition.
A28. The shipping container as claimed in claim A27, wherein the end wing is hinged to
the floating partition to provide an end wing gate.
A29. The shipping container as claimed in claim A28, wherein the hinged end wing is
secured near the front wall in a first position and wherein the end wing can be put into a
second position, when the container door is open, extending beyond the front wall.
A30. The shipping container as claimed in claim A28 or claim A29, wherein the end wing
further comprises an end wing frame.
A31. The shipping container as claimed in claim A30, further comprising one or more end
wing stanchions.
A32. The shipping container as claimed in claim A31, further comprises one or more end
wing cross members mounted across at least a portion of the end wing frame.
A33. The shipping container as claimed in claim A32, wherein the cross members are
spaced so as to provide ladder steps from the container floor to the loft.
A34. The shipping container as claimed in any one of claims A29 to A33, further
comprising a wing gate barrier sheet connected with the wing gate frame.
A35. The shipping container as claimed in any preceding claim, further comprising: (a) a
first ventilation fan mounted at the front wall; (b) a second ventilation fan mounted at the
back wall; (c) a first circulation spacing formed between the first ventilation fan and the loft at the front wall; and (d) a second circulation spacing formed between the second ventilation fan and the loft at the back wall.

A36. The shipping container as claimed in claim A35, further comprising a back gate formed in the floating partition adjacent to the second circulation spacing formed between the second ventilation fan and the loft.

A37. The shipping container as claimed in any preceding claim, further comprising: a personnel opening in the container door, wherein the personal door is positioned on the front wall of the shipping container to provide access to the catwalk and the end wing cross members while the container door remains shut.

A38. The shipping container as claimed in any preceding claim, further comprising: one or more shutters mounted with one or more ventilation openings, the ventilation openings supported by a reinforcement frame.

A39. The shipping container as claimed in claim A38, wherein the shutters further comprise: (a) a shutter cover having an opened position and a closed position; and (b) a shutter link fixed to the shutter cover.

A40. The shipping container as claimed in claim A38 or claim A39, wherein the shutters further comprise: ventilation link fixed to the ventilation frame, wherein the shutter link is slidable between two positions relative to the ventilation link, and wherein in a first position the shutter cover extends past the reinforcement frame retaining the shutter cover in either the open or closed positions, and wherein in the second position, the shutter cover moves freely between the first opened position and the second closed position.

In addition to the floating components of certain embodiments described herein, an epoxy paint may be used on the floor of the shipping container. The epoxy paint may be impermeable to water and may provide a coating making it easier to flush waste and other materials out of the container after livestock are unloaded. The epoxy paint may further be formulated with a material providing texture to provide livestock with more stable footing during transport. Such an epoxy paint, particularly when utilized on the floor of the shipping container may provide a synergy with the floating partition, greatly improving the ability to easily and thoroughly clean the shipping container between shipments.
As can be easily understood from the foregoing, the basic concepts of the present invention may be embodied in a variety of ways. The invention involves numerous and varied embodiments of shipping container and methods of making and using the shipping container including, but not limited to, the best mode of the invention.

As such, the particular embodiments or elements of the invention disclosed by the description or shown in the figures or tables accompanying this application are not intended to be limiting, but rather exemplary of the numerous and varied embodiments generically encompassed by the invention or equivalents encompassed with respect to any particular element thereof. In addition, the specific description of a single embodiment or element of the invention may not explicitly describe all embodiments or elements possible; many alternatives are implicitly disclosed by the description and figures.

Moreover, for the purposes of the present description and claims, the term "a" or "an" entity refers to one or more of that entity; for example, "a container" refers to one or more containers. As such, the terms "a" or "an", "one or more" and "at least one" should be understood as interchangeable as used herein.

All numeric values herein are assumed to be modified by the term "about", whether or not explicitly indicated. For the purposes of the present invention, ranges may be expressed as from "about" one particular value to "about" another particular value. When such a range is expressed, another embodiment includes from the one particular value to the other particular value. The recitation of numerical ranges by endpoints includes all the numeric values subsumed within that range. A numerical range of one to five includes for example the numeric values 1, 1.5, 2, 2.75, 3, 3.80, 4, 5, and so forth. It will be further understood that the endpoints of each of the ranges are significant both in relation to the other endpoint, and independently of the other endpoint. When a value is expressed as an approximation by use of the antecedent "about," it will be understood that the particular value forms another embodiment.

In addition, as to each term used it should be understood that unless its utilization in this application is inconsistent with such interpretation, common dictionary definitions should be understood to be included in the description for each term as contained in the

The background section of this patent application provides a statement of the field of endeavor to which the invention pertains. This section may also incorporate or contain paraphrasing of certain United States patents, patent applications, publications, or subject matter of the claimed invention useful in relating information, problems, or concerns about the state of technology to which the invention is drawn toward. It is not intended that any United States patent, patent application, publication, statement or other information cited or incorporated herein be interpreted, construed or deemed to be admitted as prior art with respect to the invention.

The claims set forth in this specification are hereby incorporated by reference as part of this description of the invention, and the applicant expressly reserves the right to use all of or a portion of such incorporated content of such claims as additional description to support any of or all of the claims or any element or component thereof, and the applicant further expressly reserves the right to move any portion of or all of the incorporated content of such claims or any element or component thereof from the description into the claims or vice versa as necessary to define the matter for which protection is sought by this application or by any subsequent application or continuation, division, or continuation-in-part application thereof, or to obtain any benefit of, reduction in fees pursuant to, or to comply with the patent laws, rules, or regulations of any country or treaty, and such content incorporated by reference shall survive during the entire pendency of this application including any subsequent continuation, division, or continuation-in-part application thereof or any reissue or extension thereon.
CLAIMS

We claim:

1. A shipping container comprising:
   (a) a front wall, a back wall, a first sidewall and a second sidewall connecting a container roof to a container floor enclosing an interior storage space, wherein the front wall further comprises a container door;
   (b) a floating partition mounted with one or more of the first and second sidewalls, wherein the floating partition separates the interior storage space into a first portion and a second portion without touching the container floor; and
   (c) a loft connected to the floating partition and mounted with one or more of the first and second sidewalls.

2. The shipping container as claimed in claim 1, further comprising: one or more column support plates connected to one or more of the first and second sidewalls.

3. The shipping container as claimed in claim 2, further comprising: one or more ventilation openings in one or more of the walls.

4. The shipping container as claimed in claim 3, wherein the ventilation openings are spaced so as not to interfere with the column support plates.

5. The shipping container as claimed in claim 2, further comprising: one or more web support plates connected to, and extending from, one or more column support plates, the one or more web support plates each having a distal end extending away from the first sidewall.

6. The shipping container as claimed in claim 5, further comprising: a trough removably mounted on one or more trough support beams, wherein the one or more trough support beams are connected to one or more web support plates.
7. The shipping container as claimed in claim 6, wherein the floating partition further comprises a bottom floating partition cross member and wherein the trough further comprises a trough front end and a trough back end, and wherein the trough front is mounted with the bottom floating partition cross member and wherein the trough back is mounted with the trough support beam.

8. The shipping container as claimed in claim 7, wherein the feed trough further comprises a polymeric material.

9. The shipping container as claimed in claim 5, further comprising: a catwalk mounted with one or more catwalk support beams, wherein the catwalk support beams are connected to one or more web support plates.

10. The shipping container as claimed in claim 5, wherein the floating partition further comprises a series of floating position columns, each floating position column having a first end in communication with a web support plate and a second end in communication with the loft.

11. The shipping container as claimed in claim 10, wherein the floating partition further comprises one or more floating partition stanchions generally parallel to the floating partition columns and one or more floating partition cross beams generally perpendicular to the floating partition columns.

12. The shipping container as claimed in claim 5, wherein the floating partition comprises one or more floating partition columns in communication with the one or more web support plates.

13. The shipping container as claimed in claim 12, wherein the floating partition columns are mounted at an angle of tilt relative to a horizontal axis as defined by the walls of the container.
14. The shipping container as claimed in claim 13, wherein the angle of tilt of the floating partition columns is between about 2 degrees and about 20 degrees off the horizontal axis, as defined by the walls.

15. The shipping container as claimed in claim 14, wherein the angle of tilt of the floating partition columns is between about 5 degrees and about 15 degrees off the horizontal axis, as defined by the walls.

16. The shipping container as claimed in claim 12, wherein the floating partition further comprises a plurality of floating partition cross members mounted with the floating partition, the floating partition cross members further comprising:
   (a) a top floating partition cross member mounted across the tops of the floating partition columns;
   (b) a bottom floating partition cross member mounted between each floating partition column; and
   (c) one or more mid floating partition cross members mounted between the top floating partition cross member and the bottom floating partition cross member so as to overlie one or more floating partition columns.

17. The shipping container as claimed in claim 16, further comprising one or more floating partition stanchions, wherein each floating partition stanchion has a first end and a second end, and wherein the first ends of the floating partition stanchions are mounted to the top floating partition cross member and the second ends of the floating partition stanchions are mounted to the bottom floating partition cross members.

18. The shipping container as claimed in claim 1, wherein the first portion of the interior storage space comprises a livestock storage area adapted to store and transport livestock and wherein the second portion of the interior storage space comprises a feed storage area adapted to store feed.
19. The shipping container as claimed in claim 18, wherein the floating feed partition provides a barrier through which livestock access feed stored in a trough.

20. The shipping container as claimed in claim 1, further comprising at least one movable gate and a plurality of sets of gate hinges mounted with the second sidewall wherein the movable gate is moveable between each set of gate hinges.

21. The shipping container as claimed in claim 1, further comprising a water impermeable coating on the floor of the container.

22. The shipping container as claimed in claim 21, wherein the water impermeable coating comprises an epoxy coating.

23. The shipping container as claimed in claim 1, further comprising an end wing mounted with the floating partition.

24. The shipping container as claimed in claim 23, wherein the end wing is hinged to the floating partition to provide an end wing gate.

25. The shipping container as claimed in claim 24, wherein the hinged end wing is secured near the front wall in a first position and wherein the end wing can be put into a second position, when the container door is open, extending beyond the front wall.

26. The shipping container as claimed in claim 24, wherein the end wing further comprises an end wing frame.

27. The shipping container as claimed in claim 26, further comprising one or more end wing stanchions.
28. The shipping container as claimed in claim 27, further comprises one or more end wing cross members mounted across at least a portion of the end wing frame.

29. The shipping container as claimed in claim 28, wherein the cross members are spaced so as to provide ladder steps from the container floor to the loft.

30. The shipping container as claimed in claim 25, further comprising a wing gate barrier sheet connected with the wing gate frame.

31. The shipping container as claimed in claim 2, wherein the loft further comprises:
   (a) a loft support beam attached at one or more column support plates on the second sidewall;
   (b) one or more loft joists having first ends and second ends, the first ends being mounted on the top floating partition cross beam and the second end being mounted on the loft support beam; and
   (c) a loft floor mounted on the one or more joists, wherein the covering further comprises openings towards the second ends of the joists, the loft floor including cut out sections.

32. The shipping container as claimed in claim 31, further comprising a rail mounted on a top surface of the loft floor.

33. The shipping container as claimed in claim 31, wherein the loft floor further comprises cut away sections.

34. The shipping container as claimed in claim 1, further comprising:
   (a) a first ventilation fan mounted at the front wall;
   (b) a second ventilation fan mounted at the back wall;
   (c) a first circulation spacing formed between the first ventilation fan and the loft at the front wall; and
(d) a second circulation spacing formed between the second ventilation fan and the loft at the back wall.

35. The shipping container as claimed in claim 34, further comprising a back gate formed in the floating partition adjacent to the second circulation spacing formed between the second ventilation fan and the loft.

36. The shipping container as claimed in claim 1, further comprising: a personnel opening in the container door, wherein the personal door is positioned on the front wall of the shipping container to provide access to the catwalk and the end wing cross members while the container door remains shut.

37. The shipping container as claimed in claim 1, further comprising: one or more shutters mounted with one or more ventilation openings, the ventilation openings supported by a reinforcement frame.

38. The shipping container as claimed in claim 37, wherein the shutters further comprise:
   (a) a shutter cover having an opened position and a closed position; and
   (b) a shutter link fixed to the shutter cover.

39. The shipping container as claimed in claim 37, wherein the shutters further comprise: ventilation link fixed to the ventilation frame, wherein the shutter link is slidable between two positions relative to the ventilation link, and wherein in a first position the shutter cover extends past the reinforcement frame retaining the shutter cover in either the open or closed positions, and wherein in the second position, the shutter cover moves freely between the first opened position and the second closed position.
40. A livestock shipping container comprising:
   (a) a front wall, a back wall, a first sidewall and a second sidewall connecting a
       container roof to a container floor enclosing an interior storage space, wherein
       the front wall further comprises a container door;
   (b) one or more column support plates welded to the first sidewall and the second
       sidewall;
   (c) one or more web support plates mounted at the column support plates on the first
       sidewall, the one or more web support plates having distal ends extending away
       from the column support plates mounted on the first sidewall;
   (d) a floating partition mounted with the distal ends of the web support plates, the
       floating partition comprising:
       (i) one or more floating partition columns mounted at the distal ends of the web
           support plates, wherein the floating partition columns are mounted at an
           angle of tilt between about 5 degrees and about 15 degrees relative to the
           sidewalls;
       (ii) a plurality of floating partition cross members mounted with the floating
           partition having:
           (1) a top floating partition cross member mounted across the tops of the
               floating partition columns;
           (2) a bottom floating partition cross member mounted between each
               floating partition column; and
           (3) one or more mid floating partition cross members mounted between the
               top floating partition cross member and the bottom floating partition
               cross member so as to overlie one or more floating partition columns;
       (iii) one or more floating partition stanchions, wherein each floating partition
           stanchion has a first end and a second end, and wherein the first ends of the
           floating partition stanchions are mounted to the top floating partition cross
           member and the second ends of the floating partition stanchions are
           mounted to the bottom floating partition cross members;
(e) a loft in communication with the floating partition and supported by one or more of the plurality of sidewalls, the loft further comprising:
   (i) a loft support beam attached at one or more column support plates on the second sidewall;
   (ii) one or more loft joists having first ends and second ends, the first ends being mounted on the top floating partition cross beam and the second end being mounted on the loft support beam; and
   (iii) a loft floor mounted on the one or more joists, wherein the covering further comprises openings towards the second ends of the joists, the loft floor including cut out sections;

(f) one or more gussets at one or more junctions of the floating partition columns and the top floating member cross beam;

(g) one or more trough support beams connected between web support plates;

(h) one or more feed troughs having a front and a back, wherein the back of the one or more troughs is mounted at the trough support beams and wherein the front of the one or more troughs is mounted at the bottom floating partition cross member;

(i) a first catwalk support beam mounted across a top surface of more than one web support plate;

(j) a second catwalk beam mounted across a top surface of more than one web support plate;

(k) a catwalk mounted with the first catwalk support beam and the second catwalk support beam;

(l) an end wing connected to the floating partition, the end wing further comprising:
   (i) an end wing frame connected to the floating partition, the end wing frame being tilted relative to the horizontal axis, as defined by the walls;
   (ii) end wing stanchions;
   (iii) end wing cross members mounted across one or more end wing stanchions, the end wing cross members being spaced so as to provide ladder steps to the loft; and
(iv) an end wing barrier sheet connected to the frame for covering a portion of
the end wing cross members and end wing stanchions;

(m) a personnel opening in the container door, wherein the personal door is
positioned on the front wall of the shipping container to provide access to the
catwalk and the end wing cross members while the container door remains shut;

(n) a first ventilation fan mounted in the front wall;

(o) a second ventilation fan mounted in the back wall;

(p) a first circulation spacing formed between the first ventilation fan and the loft
floor at the front wall;

(q) a second circulation spacing formed between the second ventilation fan and the
loft floor at the back wall;

(r) a back gate formed in the floating partition adjacent to the second gap formed
between the second ventilation fan and the loft floor;

(s) a rail mounted on the top surface of the loft flooring; and

(t) one or more shutters mounted with one or more ventilation openings, the
ventilation openings supported by a reinforcement frame, wherein the shutters
further comprise;

(i) a shutter cover having an opened position and a closed position;

(ii) a shutter link fixed to the shutter cover; and

(iii) a ventilation link fixed to the ventilation frame, wherein the shutter link is
slidable between two positions relative to the ventilation link, and wherein
in a first position the shutter cover extends past the reinforcement frame
retaining the shutter cover in either the open or closed positions, and
wherein in the second position, the shutter cover moves freely between the
first opened position and the second closed position.

41. A livestock shipping container comprising:

(a) a front wall, back wall, first sidewall and second sidewall connecting a container
roof to a container floor enclosing an interior storage space, wherein the front
wall further comprises a container door;
(b) one or more column support plates mounted with the first sidewall;
(c) one or more web support plates mounted at the column support plates at the first sidewall, the one or more web support plates having distal ends extending away from the column support plates mounted at the first sidewall;
(d) a floating partition mounted with the web support plates;
(e) one or more feed troughs mounted with the floating partition;
(f) a catwalk mounted with the floating partition;
(g) a loft in communication with the floating partition and supported by one or more of the plurality of sidewalls; and
(h) an end wing connected to the floating partition.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/US20 13/037 79

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - B60P 3/04 (2013.01)
USPC - 119/412

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - B60P 3/04; B61D 49/00; B62D 33/04 (2013.01)
USPC - 119/408, 409, 412, 413, 416, 454, 496, 500; 280/Dig. 8; 296/12, 24.3, 24.31, 24.4, 35.1, 35.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - B60P 3/04; B61D 3/163, 45/006; B62D 25/2054, 33/042 (2013.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, Google Patents, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>Y</td>
<td>Us 3,865,524 A (GREGORY) 27 May 1975 (27.05.1975) entire document</td>
<td>1-4, 18-24, 34, 36, 37</td>
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<td>Y</td>
<td>Us 233,129 A (WOODRUFF) 12 October 1880 (12.10.1880) entire document</td>
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<td>Us 6,955,897 B1 (CULP et al) 24 May 2005 (24.05.2005) entire document</td>
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<td>A</td>
<td>Us 3,824,958 A (PARADY, JR) 23 July 1974 (23.07.1974) entire document</td>
<td>1-41</td>
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Further documents are listed in the continuation of Box C.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

Date of the actual completion of the international search
15 July 2013

Date of mailing of the international search report
Z 4 JUL 2013

Authorized officer:
Blaine R. Copenheaver
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