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(54) Title: HEIGHT ADJUSTABLE COLUMN FOR A SHIPPING CONTAINER BUILDING STRUCTURE

(57) Abstract: A height adjustable column 100 for a shipping container building structure. The height adjustable column has an upper sleeve portion 105, a middle sleeve portion 104 and a lower sleeve 101. The middle sleeve portion 104 is able slide and be positioned within the lower and upper sleeve portions 101, 105. The upper sleeve portion 105 is able to slide and be positioned within the lower sleeve portion 101 so that when the column is in the non-extended position the middle sleeve portion 104 is fully slid within the lower and upper sleeve portions 101, 105 and a substantial length of the upper sleeve portion 105 is slid within the lower sleeve portion 101 such that the ISO apertures 103 1 of the middle sleeve portion 104 is aligned and coincides with the ISO apertures 103 1 of the lower sleeve portion 101 and the upper ISO apertures 104 1 of the middle sleeve portion 104 is aligned and coincides with the ISO apertures 107 1 of the upper sleeve portion 101 whereby the height of the column 100 is at a reduced height compared to that of a standard shipping container. When the column 100 is in the extended position locking means 1044 on the middle sleeve portion 104 engage and lock with the corresponding slotted apertures 1025, 1055 on the lower and upper sleeve portions 101, 105 as to support and retain the column 100 at a height equal to or greater than the height of a standard shipping container.

[Continued on next page]
Declarations under Rule 4.17:
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Hi))
Height Adjustable Column for a Shipping Container Building Structure

Field of the Invention

The invention relates to a Height Adjustable Column for a Shipping Container Building Structure.

Background of Invention

A problem with existing methods of shipping standard shipping containers lies in the height and transport costs of a product which does not take up the full space within the container particularly where the container is to be used as some form of accommodation. In such cases the interior of the container is often almost empty but because the eventual residential height in the container is full height the transport costs are high.

Equally, where accommodation which is greater than the height of a shipping container must be provided the only real option is to provide it as two containers, one without floor, which must be mounted on top of each other. Having a shipping container that can be raised from a height for transportation to a height for use as a building structure is desired.

Prior References:

All references, including any patents or patent applications cited in this specification are hereby incorporated by reference. No admission is made that any reference constitutes prior art. The discussion of the references states what their authors assert, and the applicants reserve the right to challenge the accuracy and pertinency of the cited documents. It will be clearly understood that, although a number of prior art publications may be referred to herein; this reference does not constitute an admission that any of these documents form part of the common general knowledge in the art, in New Zealand or in any other country.

Object of the Invention

It is an object of the invention to provide a height adjustable column for a shipping container building structure that ameliorates some of the disadvantages and limitations of the known art or at least provide the public with a useful choice.
Summary of Invention

In a first aspect the invention resides in a height adjustable column for a shipping container building structure, wherein the column has at least two co-operating parts, in which a first part of the column telescopes over a second part of the column, both parts having engagement features engageable by a container handling apparatus such that the column can be extended from a telescoped form to an extended position, wherein when in the telescoped form a substantive length of the second part is within the first part and when in the extended position a substantive length of the second part extends outwardly from the first part, the engagement feature of the first part when the column is in the extended position is adapted to engage and support a floor of a building structure and the engagement feature of the second part when the column is in the extended position is adapted to engage and support either the roof or an upper floor of a building structure, the column, when in telescoped form is adapted to secured to a base of a shipping container at one end and to an upper surface of the shipping container at the other end, such that when the column is in the non-extended position the height of the column is at a reduced height compared to that of a standard shipping container and when in the extended position the column is at a height equal to or greater than the height of a standard shipping container.

In a second aspect the invention resides in a height adjustable column for a shipping container building structure, wherein the column has:

(i) upper sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and a lower part with slotted apertures adapted to engage with locking means on a corresponding sleeve,

(ii) middle sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and with locking means and a lower part with engagement features engageable by a container handling apparatus and with locking detents,

(iii) lower sleeve portion, having an upper part with slotted apertures adapted to engage with locking means on a corresponding sleeve and a lower part with engagement features engageable by a container handling apparatus,
(iv) lifting points situated at the top part of the upper sleeve portion and the lower part of the lower sleeve portion, the lifting points accommodating the respective engagement features of the upper and lower sleeve portions, and

(v) engagement means to engage and hold structural elements of a building structure in place when the column is an extended position,

wherein the middle sleeve portion is adapted to slide and be positionable within relative to the lower and upper sleeve portions and the upper sleeve portion is adapted to slide and be positionable within relative to the lower sleeve portion so that when the column is in the non-extended position the middle sleeve portion is fully slid within the lower and upper sleeve portions and a substantive length of the upper sleeve portion is slid within the lower sleeve such that the lower engagement feature of the middle sleeve portion is aligned and coincides with the engagement feature of the lower sleeve portion and the upper engagement feature of the middle sleeve portion is aligned and coincides with the engagement feature of the upper sleeve portion such that the height of the column is at a reduced height compared to that that of a standard shipping container; when the column is in the extended position the locking means on the middle portion engage and lock with the corresponding slotted apertures on the lower and upper sleeve portions as to support and retain the column at a height equal to or greater than the height of a standard shipping container.

Preferably, the lower sleeve has a floor engaging portion adapted to engage and attach to a floor of a building structure.

Preferably, the upper sleeve has a roof or upper level engaging portion adapted to engage and attach to a roof or upper level of a building structure.

Preferably, the locking means are spring loaded detents.

Preferably, the engagement features are apertures adapted to receive and engage with the container handling apparatus in order to allow the column to be raised from a non extended state to an extended raised state.

Preferably, the apertures are of the ISO standard container connection points.

Preferably, the engagement means includes a slot, channel or groove capable of receiving and holding an edge or part of an edge of a wall panel, window frame or door frame therein.
Preferably, the engagement means includes projection means capable of receiving and holding an edge or part of an edge of a roof section, floor, window frame or door frame thereon. 

Preferably, the engagement means includes a bracket or flange capable of receiving and holding an edge or part of an edge of a roof section, floor, wall panel, window frame or door frame thereon.

Preferably, in the expanded form the column remain capable of supporting vertical loads. Preferably, the column is hollow.

Preferably, the interior space of the hollow column is capable of receiving pourable settable material therein once the column is in the extended position in order to provide a strong, rigid and durable column able to support and bear loads associated with a building structure. Preferably, the column may include elements acting as reinforcement for the settable material.

Preferably, the reinforcement elements may extend through to a lower floor, roof or upper floor of a building structure.

In a third aspect the invention resides in a height adjustable column for a shipping container building structure, wherein the column has:

(i) at least an upper sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and a lower part with slotted apertures adapted to engage with locking means on a corresponding sleeve,

(ii) at least a lower sleeve portion, having an upper part with slotted apertures adapted to engage with locking means on a corresponding sleeve and a lower part with engagement features engageable by a container handling apparatus, and

(iii) engagement means to engage and hold structural elements of a building structure in place when the column is an extended position,

wherein the upper sleeve portion is adapted to slide and be positionable within relative to the lower portion so that when the column is in the non-extended position a substantive length of the upper sleeve portion is slid within the lower sleeve such that the height of the column is at a reduced height compared to that that of a standard shipping container; when the column
is in the extended position the locking means on the each of the sleeve portions engage and lock with the corresponding slotted apertures on the sleeve portions so as to support and retain the column at a height equal to or greater than the height of a standard shipping container.

Preferably, the columns has additional sleeve portions adapted to slide and be positionable within relative to the lower and upper sleeve portions.

In fourth aspect as herein described the invention relates to a method of manufacturing an expandable shipping container utilising columns described in the aforementioned aspects, wherein the method includes:

(i) providing a container base and columns, the columns when not expanded extending to a packaged height,

(ii) providing at least one first vertical wall portion attached to the base and extending less than the packaged height of the container,

(iii) providing an upper surface secured at at least one position to an upper portion of an expandable vertical column,

(iv) providing at least one second vertical wall portion extending towards the first vertical wall portion from the upper surface; and

(v) extending the columns to an expanded position further spacing the first vertical wall portion from the second vertical wall portion.

Brief Description

The invention will now be described, by way of example only, by reference to the accompanying drawings:

Figure 1 is a height adjustable shipping container in accordance with an embodiment of the invention.

Figure 2 is the container of Figure 1 in an expanded position.

Figure 3 is a variation of the container of Figure 1.

Figure 4 is a detail of a telescoping expanding vertical container column in accordance with a first preferred embodiment of the invention.
Figure 5 is an exploded view of a column in accordance to the preferred embodiment of the invention.

Figure 6 is side view of the column as shown in figure 5 in a non-extended state.

Figure 7 is side view of the column as shown in figure 5 in a partially extended state.

Figure 8 is side view of the column as shown in figure 5 in a fully extended state.

Figure 9 is side view of the column as shown in figure 5 in a final extended state.

Figure 10 is perspective view of a column in accordance to another embodiment of the invention.

Figure 11 is perspective view of a column in accordance to a further embodiment of the invention.

Figure 12 is a cross-sectional profile of the columns shown in figure 11.

Figure 13 is a view of a building structure incorporating the column as shown in figure 11.

Figure 14 is a side view of a building structure incorporating the column as shown in figure 11.

Figure 15 is a top cut-away view of a building structure incorporating the column as shown in figure 11.

Figure 16 is a perspective of the column an extended state in accordance to a further embodiment of the invention.

Figure 17 is a perspective of the column as shown in figure 16 in an extended state.

Figure 18 is a view of a building structure incorporating the column as shown in figure 16.

Figures 19 to 22 show differing preferred cross-sectional profile views of the column.

Description of the Preferred Embodiment(s):

The following description will describe the invention in relation to preferred embodiments of the invention, namely a height adjustable shipping container The invention is in no way limited to these preferred embodiments as they are purely to exemplify the invention only
and that possible variations and modifications would be readily apparent without departing from the scope of the invention.

Figure 1 shows a height adjustable shipping container 1 in which vertical corner rails extend to trucking and lifting points 2 at each end. Vertical walls on the exterior extend to cut line 5 forming partial end panel 3, partial side panel 4 and top panel and top side partial panels 6.

Figure 2 shows the container of Figure 1 in expanded form in which telescoping rails 7 have been expanded, a panel 10 formerly behind panel 3 has been pulled up into place and a window 8 formerly packed inside the container with windows 9 has been placed in the gap formed by expansion. Other panels or equipment which may have been packed within the container, such as doors, roller doors, ventilators, tables, etc can be fitted to the expanded container. Still others may be permanently fitted to the container before dispatch, such as lighting or plumbed fitments.

Figure 3 shows a container 11 with a tilted top forming part of a peaked pitched roof 12 and an end panel 13. Cut lines 5 are offset, providing for different panel fitments at each cut.

Typically any services required in the container (plumbing, electrical) are located adjacent a joint line to allow easy servicing and testing on installation. Figure 4 shows a view of a telescoping column in expanded form. A lower portion 71 with engagement feature 73 for trucking or lifting has a cap 72 which slides down over portion 71. When slid down the engagement features 74 align with those at 73 to allow lifting the compacted container.

It is important that the compacted container still adheres to the measurements of a standard shipping container which means that in some cases a collapsed telescoping pole will still stand above part of the structure of a containerised building, as in Figure 3.

Figure 4 shows a view of a telescoping pole in expanded form. A lower portion 71 with engagement feature 73 for trucking or lifting has a cap 72 which slides down over portion 71. When slid down the engagement features 74 align with those at 73 to allow lifting the compacted container.

Figures 5 to 9 show views of a preferred form of the column. The column 100 includes three telescoping sleeves 102, 104, 105 in which sleeves 102, 104 telescopes within parts 101 such that when the column 100 is in the non-extended position the height of the column at a reduced height compared to that of a standard shipping container and when in the extended position the column 100 is at a height equal to or greater than the height of a
standard shipping container. The upper sleeve 105 has an upper part 107 with apertures 1071, 1072 engageable by a container handling apparatus such as fork lift truck in order to assist in the raising, lowering and adjusting the height of the column. The lower part of the upper sleeve 105 has slotted apertures 1055 that engage with locking detents 1044 on the middle sleeve 104. The middle sleeve also has apertures 1031, 1041 engageable by a container handling apparatus such as fork lift truck when the column is in its unextended state where the apertures are aligned and coincide with the respective apertures 1011, 1071 of the lower and upper sleeves 102, 105. The lower sleeve 102 has a lower part 101 with apertures 101 engageable by a container handling apparatus such as fork lift truck in order to assist in the raising, lowering and adjusting the height of the column. The upper part of the lower sleeve 101 has slotted apertures 1025 that engage with respective locking detents 1044 on the middle sleeve 104. Figure 6 shows a column 100 in non extended state where the middle and upper sleeves 104, 105 are telescoped within the lower sleeve 102 such that the respective container handling apparatus apertures are aligned and coincide ready to accommodate container handling apparatus to move and raise a shipping container incorporating such columns. Figure 7 shows a partially extended column 100. Figure 8 shows a fully extended column 100 suitable to allow wall panels, windows and doors to be erected. Figure 9 shows a column in its final height in which its lowered from the maximum height extension as shown in figure 8 in order to firmly hold and seal the wall panels, windows, doors in place.

Figure 10 shows an alternative column 200 having a different cross-sectional profile to the columns as shown in figures 5 to 9.

Figures 11 & 12 show a column 700 suitable to be used where multiple shipping containers like structures are to be joined together as shown in figure 13. Instead of a square, rectangular or other closed polygonal cross-sectional profile, the column 700 has an open cross-sectional profile (figure 12) that allow for the column 700 to abut and co-operate with three adjacent columns (figures 14, 15) so that columns 700 can be coupled together to provide structural rigidity and integrity to adjacent sections of the building structure.

Figures 16 to 18 show another alternative column arrangement where the column 700 is able to be extended forms a storage & transportation height (figure 16) to a multi storey extended height (figures 17 & 18). The column is able to support not just the floor and roof sections 1601, 1602 but also an upper floor 1602, thus allowing for a multi-storey building structure.
to be assembled from components transported in shipping container having such columns 700.

Figures 19 to 22 show differing column profiles that are preferred. The profile shown in figure 19 allows for two piece fabricated sections, exterior landing to secure wall panels, inside face aligns with wall panels and is very rigid. Figure 20 is just a standard off the shelf square rolled profile that is suitable for most situations. The profile shown in figure 21 has fabricated sections and allows ducting services to get past column behind a coving. The profile shown in figure 22 is similar to that of that of figure 21 but is used for a two piece column.

The columns can include features to engage with and hold building elements, such as roof sections, floor, wall panels, window and door frames, etc in place once the columns are fully extended. These features, either separately or in combination, can include slots, channels, grooves, projections, flange, brackets, etc where these features are capable of receiving and holding an edge or part of an edge of a roof section, floor wall panel, window frame or door frame therein or thereon.

In the expanded form the column remains capable of supporting vertical loads.

Preferably, the column is hollow.

The interior space of the hollow column is capable of receiving therein pourable settable material such as concrete once the column is in the extended position in order to provide a strong, rigid and durable column able to support and bear loads associated with a building structure. The column may also include elements acting as reinforcement for the settable material. The reinforcement elements may extend through to a lower floor, roof or upper floor of a building structure.

It is possible to gain as much height as possible from the columns for the purpose of a minimum habitable ceiling height of 2400mm or even higher in some situations. The maximum available column height is very important because of the space and height required for the ceiling and roof area height combined with the floor sections that may also require the installation of services. By eliminating the ISO castings that exist on standard containers at present where the height of these castings is approximately 120mm each, by combining the top and bottom ISO castings there was 240mm additional available height and utilizing this height with the inventive column that could be overlapped at least twice if not 3
or more times. An additional minimum of 480 mm of column height is able to be obtained that can be used for extending, overlaps, etc.

An important advantage with using the inventive columns is the ability to use both the standard height and the high cube containers as the basis of the height adjustable container and two or more near completed accommodation containers could be transported at the same time.

The column is preferably made from steel and has the holes therein can be laser cut.

The column can also be incorporated into a two, three or more stage column.

10 Drawings Number Description List

1 Container
2 Lifting Points
3 Partial End Panel
4 Partial Side Panel
5 Cut Line
6 Partial Top Side Panels
7 Telescoping Rails
8 Window
9 Window
10 Panel
11 Container
12 Roof
13 End Panel
14 Lower Portion
15 Cap
16 Engagement Feature
17 Engagement Feature
100 Column
101 ISO Standard Container Lower Corner Connection Point
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Lower Section Inner Sleeve</td>
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<tr>
<td>103</td>
<td>Sliding Section Spacer Sleeve</td>
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<tr>
<td>104</td>
<td>Sliding Section Centre Sleeve</td>
</tr>
<tr>
<td>105</td>
<td>Upper Section Inner Sleeve</td>
</tr>
<tr>
<td>106</td>
<td>Upper Section Outer Sleeve</td>
</tr>
<tr>
<td>107</td>
<td>ISO Standard Container Upper Corner Connection Point</td>
</tr>
<tr>
<td>200</td>
<td>Column</td>
</tr>
<tr>
<td>201</td>
<td>ISO Standard Container Lower Corner Connection Point</td>
</tr>
<tr>
<td>202</td>
<td>Lower Section Inner Sleeve</td>
</tr>
<tr>
<td>203</td>
<td>Sliding Section Spacer Sleeve</td>
</tr>
<tr>
<td>204</td>
<td>Sliding Section Centre Sleeve</td>
</tr>
<tr>
<td>205</td>
<td>Upper Section Inner Sleeve</td>
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<tr>
<td>206</td>
<td>Upper Section Outer Sleeve</td>
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<td>207</td>
<td>ISO Standard Container Upper Corner Connection Point</td>
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<tr>
<td>700</td>
<td>Column</td>
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<tr>
<td>701</td>
<td>ISO Standard Container Lower Corner Connection Point</td>
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<tr>
<td>702</td>
<td>Lower Section Inner Sleeve</td>
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<tr>
<td>710</td>
<td>Flange</td>
</tr>
<tr>
<td>711</td>
<td>Flange</td>
</tr>
<tr>
<td>720</td>
<td>Central Columns</td>
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<tr>
<td>800</td>
<td>Building structure</td>
</tr>
<tr>
<td>801</td>
<td>Floor</td>
</tr>
<tr>
<td>805</td>
<td>Column</td>
</tr>
<tr>
<td>1014</td>
<td>Hole for Transport Locking Bolt, One Each Side</td>
</tr>
</tbody>
</table>
Lower Sleeve Section, Could Be Made From Pressed Plate or RHS

Slotted Hole for Positioning Detent

ISO Corner Connection Point - Aligns With Lower Hole When In 'Down' Position

Hole for Positioning Detent To Be Mounted In.

Centre Sleeve Section, Could Be Made From Pressed Plate or RHS

Locking Bolt Holes When In 'Up' Position

Hole for Transport Locking Bolt, One Each Side

Slotted Hole for Positioning Detent

Side Plate with ISO Standard Connection Holes

Top Plate with ISO Standard Connection Hole

Floor

Upper level

Roof

Advantages

a) Reduces welds and increases strength.

b) Reduced cost

c) Eliminates ISO corner castings

d) Single manufacturing system for production of columns

e) Allows for additional height to be gained

f) Allows the column sections to be locked together when they are lifted as two or more sleeves of steel column will be captured or engaged by the lifting apparatus locking keys/lugs.

g) Allows the full use of the area of the container

h) Up to eight column types

i) Shaped to mimic ISO block

j) Staged columns with 2, 3 or more sliding and telescoping sleeve portions
5 Variations

It will of course be realised that while the foregoing has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as is hereinbefore described.
Claims

Claim 1: A height adjustable column for a shipping container building structure, wherein the column has at least two co-operating parts, in which a first part of the column telescopes over a second part of the column, both parts having engagement features engageable by a container handling apparatus such that the column can be extended from a telescoped form to an extended position, wherein when in the telescoped form a substantive length of the second part is within the first part and when in the extended position a substantive length of the second part extends outwardly from the first part, the engagement feature of the first part when the column is in the extended position is adapted to engage and support a floor of a building structure and the engagement feature of the second part when the column is in the extended position is adapted to engage and support either the roof or an upper floor of a building structure, the column, when in telescoped form is adapted to secured to a base of a shipping container at one end and to an upper surface of the shipping container at the other end, such that when the column is in the non-extended position the height of the column is at a reduced height compared to that that of a standard shipping container and when in the extended position the column is at a height equal to or greater than the height of a standard shipping container.

Claim 2: A height adjustable column for a shipping container building structure, wherein the column has:

(i) upper sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and a lower part with slotted apertures adapted to engage with locking means on a corresponding sleeve,

(ii) middle sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and with locking means and a lower part with engagement features engageable by a container handling apparatus and with locking detents,

(iii) lower sleeve portion, having an upper part with slotted apertures adapted to engage with locking means on a corresponding sleeve and a lower part with engagement features engageable by a container handling apparatus,
(iv) lifting points situated at the top part of the upper sleeve portion and the lower part
of the lower sleeve portion, the lifting points accommodating the respective
engagement features of the upper and lower sleeve portions, and

(v) engagement means to engage and hold structural elements of a building structure
in place when the column is an extended position,

wherein the middle sleeve portion is adapted to slide and be positionable within relative to
the lower and upper sleeve portions and the upper sleeve portion is adapted to slide and be
positionable within relative to the lower sleeve portion so that when the column is in the non-
extended position the middle sleeve portion is fully slid within the lower and upper sleeve
portions and a substantive length of the upper sleeve portion is slid within the lower sleeve
such that the lower engagement feature of the middle sleeve portion is aligned and coincides
with the engagement feature of the lower sleeve portion and the upper engagement feature of
the middle sleeve portion is aligned and coincides with the engagement feature of the upper
sleeve portion such that the height of the column is at a reduced height compared to that that
of a standard shipping container; when the column is in the extended position the locking
means on the middle portion engage and lock with the corresponding slotted apertures on the
lower and upper sleeve portions as to support and retain the column at a height equal to or
greater than the height of a standard shipping container.

Claim 3: The height adjustable column as claimed in claim 2, wherein the locking
means are spring loaded detents.

Claim 4: The height adjustable column as claimed in claim 2, wherein the engagement
features are apertures adapted to receive and engage with the container handling apparatus in
order to allow the column to be raised from a non extended state to an extended raised state.

Claim 5: The height adjustable column as claimed in claim 4, wherein the apertures are
of the ISO standard container connection points.

Claim 6: The height adjustable column as claimed in any one of claims 2 to 5, wherein
the engagement means includes a slot, channel or groove capable of receiving and holding an
edge or part of an edge of a wall panel, window frame or door frame therein.

Claim 7: The height adjustable column as claimed in any one of claims 2 to 5, wherein
the engagement means includes projection means capable of receiving and holding an edge or
part of an edge of a roof section, floor, window frame or door frame thereon.
Claim 8: The height adjustable column as claimed in any one of claims 2 to 5, wherein the engagement means includes a bracket or flange capable of receiving and holding an edge or part of an edge of a roof section, floor, wall panel, window frame or door frame thereon.

Claim 9: The height adjustable column as claimed in any one of claims 2 to 8, wherein, in the expanded form the column remain capable of supporting vertical loads.

Claim 10: The height adjustable column as claimed in any one of claims 1 to 9, wherein, the column is hollow.

Claim 11: The height adjustable column as claimed claim 10, wherein the interior space of the hollow column is capable of receiving pourable settable material therein once the column is in the extended position in order to provide a strong, rigid and durable column able to support and bear loads associated with a building structure.

Claim 12: The height adjustable column as claimed in claim 11, wherein the column may include elements acting as reinforcement for the settable material.

Claim 13: The height adjustable column as claimed in claim 12, wherein the reinforcement elements may extend through to a lower floor, roof or upper floor of a building structure.

Claim 14: A height adjustable column for a shipping container building structure, wherein the column has:

(i) at least an upper sleeve portion, having an upper part with engagement features engageable by a container handling apparatus and a lower part with slotted apertures adapted to engage with locking means on a corresponding sleeve, 

(ii) at least a lower sleeve portion, having an upper part with slotted apertures adapted to engage with locking means on a corresponding sleeve and a lower part with engagement features engageable by a container handling apparatus,

(iii) lifting points situated at the top part of the upper sleeve portion and the lower part of the lower sleeve portion, the lifting points accommodating the respective engagement features of the upper and lower sleeve portions, and

(iv) engagement means to engage and hold structural elements of a building structure in place when the column is an extended position,
wherein the upper sleeve portion is adapted to slide and be positionable within relative to the lower portion so that when the column is in the non-expanded position a substantive length of the upper sleeve portion is slid within the lower sleeve such that the height of the column is at a reduced height compared to that of a standard shipping container; when the column is in the extended position the locking means on the each of the sleeve portions engage and lock with the corresponding slotted apertures on the sleeve portions so as to support and retain the column at a height equal to or greater than the height of a standard shipping container.

Claim 15: The height adjustable column as claimed in claim 14, wherein, the column has additional sleeve portions adapted to slide and be positionable within relative to the lower and upper sleeve portions.

Claim 16: The height adjustable column as claimed in any one of the preceding claims, wherein the lower sleeve has a floor engaging portion adapted to engage and attach to a floor of a building structure.

Claim 17: The height adjustable column as claimed in any one of the preceding claims, wherein the upper sleeve has a roof or upper level engaging portion adapted to engage and attach to a roof or upper level of a building structure.

Claim 18: A method of manufacturing an expandable shipping container utilising columns as claimed in any one of claims 1 to 15, wherein the method includes:

(i) providing a container base and columns, the columns when not expanded extending to a packaged height,

(ii) providing at least one first vertical wall portion attached to the base and extending less than the packaged height of the container,

(iii) providing an upper surface secured at at least one position to an upper portion of an expandable vertical column,

(iv) providing at least one second vertical wall portion extending towards the first vertical wall portion from the upper surface; and

(v) extending the columns to an expanded position further spacing the first vertical wall portion from the second vertical wall portion.
INTERNATIONAL SEARCH REPORT

PCT/AU2013/000129

A. CLASSIFICATION OF SUBJECT MATTER

E04B 1/343 (2006.01)  E04B 1/18 (2006.01)  B65D 90/20 (2006.01)  E04C 3/30 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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

WPI, EPDOC, IPC, CPC: B65D88/12/low, B65D88/10, B65D88/52/low, E04B1/18/low, E04B1/02/low, E04B1/24/low, E04B1/343/low, E04B1/342/low, B60P3/34, E04H1/00/low, E04C3/30/low, E04H3/00/low, E04H5/00/low, E04H7/00/low, height, high, adjustable, column, rail, container and similar terms

Google Patent Search: KW: Telescopic Poles, steel columns and concrete, height adjustable shipping container

Google Search: KW: shipping container corner posts and reinforcement and concrete

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

Date of mailing of the international search report
15 April 2013

Name and mailing address of the ISA/AU

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Authorised officer

Alison Copley
AUSTRALIAN PATENT OFFICE
(ISO 9001 Quality Certified Service)
Telephone No. 0262832460

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