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(54) **Transport container for bulk materials**

(57) A transport container (1) has a floor (2) inclined downwardly to an outlet (7) and including at least one conveyor (6), which may be an airslide for fluidising particulate material, for carrying the contents of the container towards the outlet. The container is filled through access manholes (9) in the container top (8).

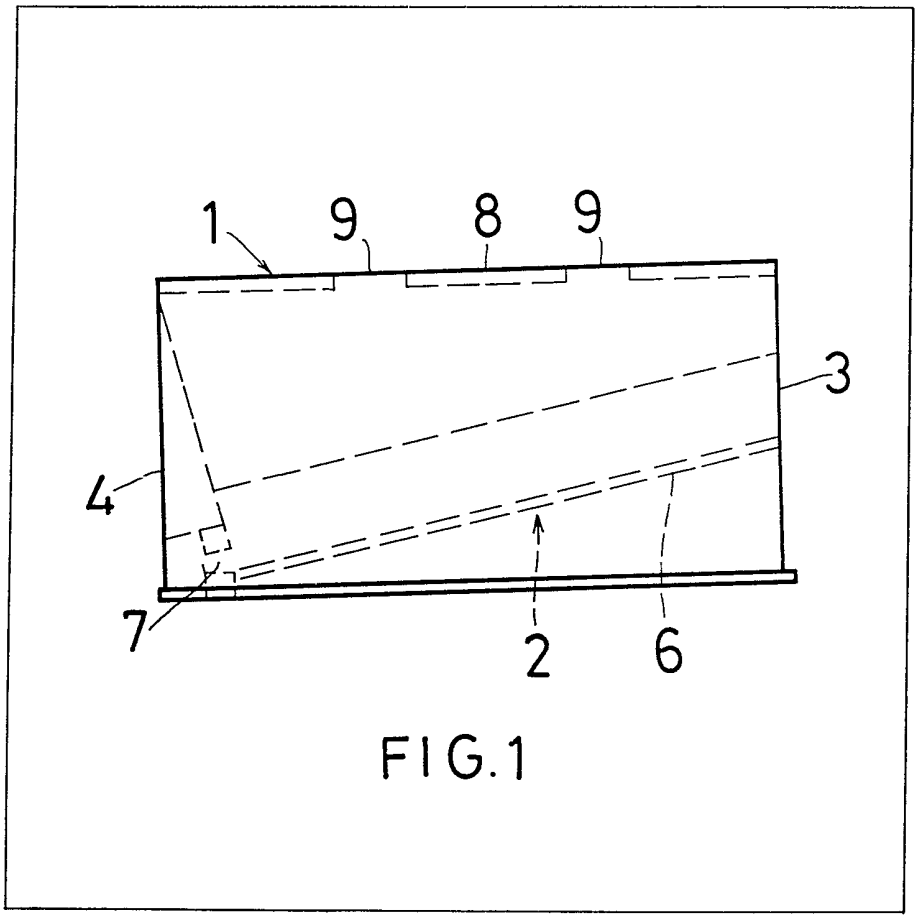

FIG.1

GB 2 098 965 A

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

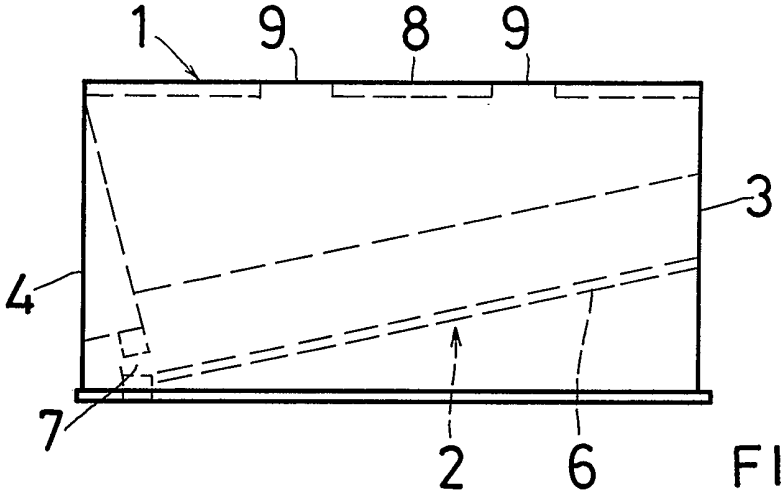

FIG.1

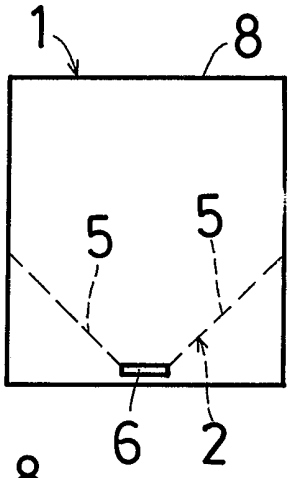

FIG.2

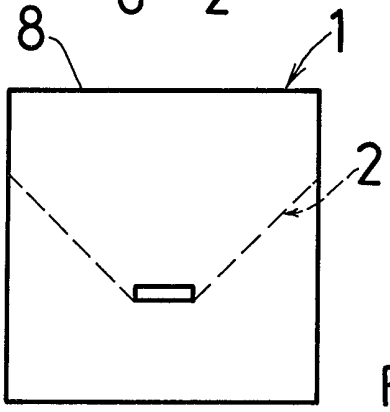

FIG.3

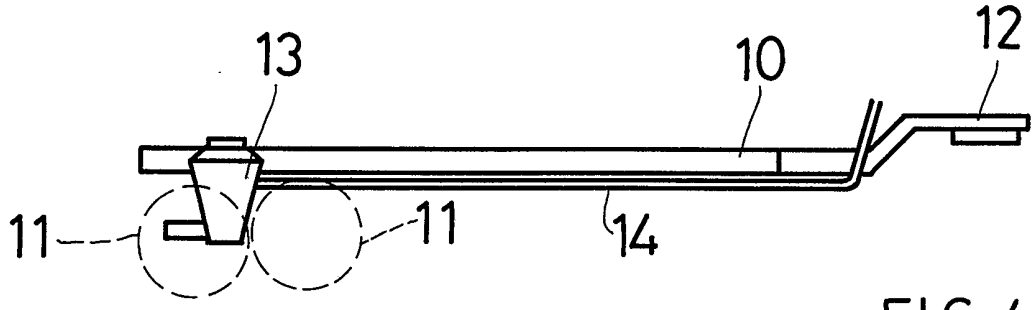

FIG.4

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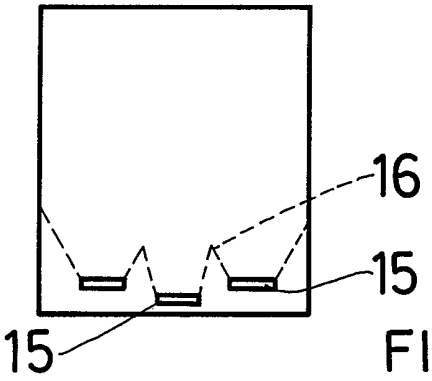

FIG. 5

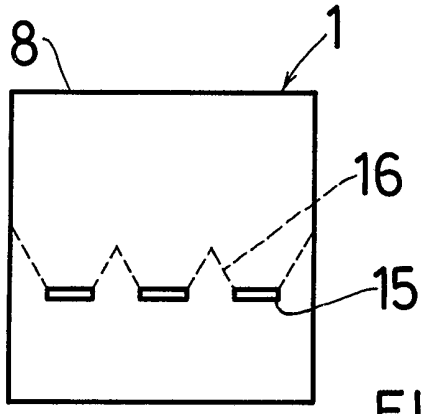

FIG. 6

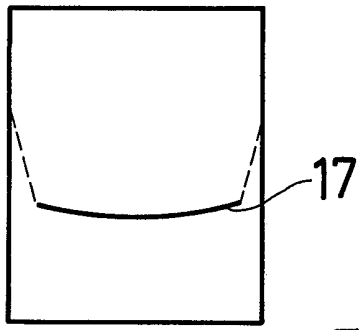

FIG. 7

SPECIFICATION

Transport container for bulk materials

This invention relates to a transport container for bulk materials which is particularly adapted for use in the conveyance of reasonably flowable bulk materials such as cement, slagment, flour and the like, milled rock dust, pulverised fuel ash and other materials having similar physical properties.

For the purpose of this specification container means a large box-like receptacle of standard design for the transportation of goods. Airslide means a type of pneumatic conveying device which comprises a substantially planar support member which is inclined to the horizontal. The planar material from which the support member is manufactured is perforated by a multiplicity of tiny perforations. Air is pumped through the perforations which causes particulate bulk material supported on the support member to fluidize and thereby flow down the incline.

Bulk materials of the general type defined above are often transported by firstly loading them into a first transport vehicle and then transferring them from that transport vehicle possibly to a second transport vehicle or directly to a ship. If loaded into a ship the bulk materials are again handled and loaded into other containers or transport vehicles for conveyance to their ultimate destination or alternatively even to an intermediate destination.

The handling of such bulk materials is both time consuming and costly and it is the object of this invention to provide a method and means of conveying such bulk materials whereby such handling is largely eliminated and also handling, where necessary, is facilitated at least in so far as unloading is concerned.

In accordance with one aspect of this invention there is provided a transport container having suitably selected dimensions for conveyance by road, rail and/or sea and wherein the floor of the container is inclined downwardly towards an outlet from the container, the floor of the container including at least one conveying device for moving bulk materials towards the outlet.

Further there is provided for the conveying device to comprise an airslide.

Further there is provided for at least the lower portions of inner sidewalls of the container to be inclined towards the conveying device.

The invention therefore also provided a method of conveying bulk materials of the above defined type which comprise loading such bulk materials into a container as defined above and conveying such container to a destination for the bulk material, and unloading the container via said outlet by allowing or causing the bulk material to move down said inclined floor towards the outlet.

Clearly where manholes are provided in the top of the container loading will be effected via such manholes. Also, unloading is preferably assisted by means of airslide or alternatively by some other conveying device provided for moving the bulk material down the inclined floor towards the outlet.

Finally the invention also provides a transport vehicle mounted on rail or road wheels and whereon there is mounted means for transferring bulk materials issuing from the outlet of a container carried, removably, by said transport vehicle when desired.

In order that the invention may be more fully understood one embodiment thereof will now be described with reference to the accompanying drawings in which:—

Fig. 1 is a side view of a transport container illustrating the floor in dotted lines.

Fig. 2 illustrates, in dotted lines, the line of the floor at the one end of the container,

Fig. 3 illustrates, the line of the floor at the other end of the container,

Fig. 4 illustrates schematically a road transport chassis suitable for facilitating the unloading of a container illustrated in Figs. 1 to 3,

Figs. 5 and 6 illustrate a section through an alternative embodiment of the invention, and

Fig. 7 illustrates a section through a third embodiment.

As illustrated in Figures 1 to 3 a transport container 1 has the general configuration of a container of known shape and size which is suitable for conveyance by road, rail and sea in known manner.

The floor 2 of the container is formed to a substantially Vee-shape in cross-section and is inclined downwardly from one end 3 of the container to substantially the other end 4. The inclined sidewalls 5 of the floor are preferably designed such that their inclination is greater than the angle of respose of the bulk material to be transported in the container. Thus when unloading the bulk material will tend to slide down these sidewalls of the floor towards the central region 6 thereof which is formed as a narrow airslide for conveying the bulk materials towards an outlet 7 from the container and which is located at the lowermost end of the inclined floor.

The top 8 to the container is formed as an integral part thereof and is provided with manholes 9 therein for facilitating filling, cleaning or providing any other access to the interior of the container which may be necessary. The manholes are, of course, made sufficiently large to enable a man to pass therethrough without difficulty.

Turning now to Fig. 4 there is illustrated a chassis 10 for supporting a container as described above and the chassis is provided with road wheels 11 and a hitch 12 to enable it to be attached to a mechanical horse, for example. The chassis carries a transfer vessel 13 located suitably so that it would correspond with the outlet 7 from the container when the container is installed removably on the chassis. The transfer vessel can be adapted to form the inlet end to a pneumatic conveyor for conveying the bulk material away from the container as it issues from the outlet. Alternatively the transfer vessel may take any other form such as a hopper feeding the bulk material on to a mechanical conveyor or any

other type of conveyor.

The air supply 14 can also be utilized for operating the airslide or in fact it could be utilized to operate any other type of conveyor installed on the central region of the floor 2 of the container. A mechanical chain and flight conveyor for example may replace the airslide. A mechanical conveyor could prove more suitable than an airslide for evacuating large particle bulk materials such as coal pieces.

A further application of the invention will be to fill a container with materials conventionally required on a building site.

The container will thereafter be left on the building site and small quantities of the material will be dispensed therefrom as required. A container so used will replace conventional storage and dispensing containers usually used on building sites. It will also be possible to stack a plurality of containers on top of each other and in so doing provide apparatus for dispensing either more of the same material before the containers need replacing, or mix together different materials in varying proportions. This could be important when dispensing feed for animals for example.

It will be understood that the container described above can be easily loaded and unloaded and the angle of inclination of the floor will be such that the airslide or other conveying means of moving bulk materials towards the outlet can operate effectively. In general where an airslide is employed the slope is expected to be not less than about 7° along the length of the container described.

Referring to Figures 5 and 6, an alternative embodiment of the invention is shown wherein the floor of the container is formed having three separate airslides 15. Inverted Vee-shaped divides 16 are located between individual airslides to thereby guide the bulk material on to the airslides. Figure 5 shows a section through the container near the outlet end thereof and Figure 6 shows a section through the container near the other end thereof.

Figure 7 shows an embodiment wherein the airslide 17 is far wider than the airslides shown in the previous embodiments. The advantage of the wide airslide is that space lost due to long inclined sidewalls is substantially minimised.

It will be understood that numerous variations may be made to the above described embodiment of the invention without departing from the scope hereof. A large variety of different types of conveying devices may be employed to evacuate the bulk material from the conveyor. Also, the floor need not necessarily be of a Vee-shape along its entire length but could be flat at the upper end and formed gently into a Vee-shape towards the outlet. In fact the floor may simply be an inclined flat floor where the outlet extends entirely across the width of the container.

Various other modifications and variations may be made which will be quite apparent to those skilled in the art and such modifications and variations are intended to fall within the scope of this invention.

CLAIMS

1. A transport container having suitably selected dimensions for conveyance by road, rail and/or sea and wherein the floor of the container is inclined downwardly toward an outlet from the container, the floor of the container including at least one conveying device for moving bulk material towards the outlet.

2. A transport conveyor as claimed in claim 1 in which the conveying device is an airslide.

3. A transport container as claimed in either preceding claim in which at least the lower portions of inner side walls of the container are inclined inwardly towards the conveying device.

4. A transport container as claimed in any preceding claims having a floor comprising a plurality of separate conveying devices.

5. A transport container as claimed in claim 4 in which a divide is located between individual conveying devices.

6. A transport container as claimed in any preceding claim in which the conveyor is inclined downwardly from one end of the container to the outlet at the other.

7. A transport container as claimed in any preceding claim in which the top of the container is provided with filling manholes with the top being substantially permanently attached to the container.

8. A method for conveying bulk materials comprising the following steps:—

1) loading bulk materials into a container as claimed in claim 1,

2) conveying such container to the destination of the bulk material,

3) unloading the container via the outlet by allowing or causing the bulk material to move down the conveyor towards the outlet.

9. A transport vehicle mounted on rail or road wheels whereon there is mounted means for transporting bulk materials issuing from the outlet of a container carried, removably, by said transport vehicle, when desired.

10. A conveyor substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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