March 10, 1964 J. BERTELS 3,124,265

TILTABLE TRANSPORT CONTAINER FOR POURABLE BULK MATERIAL

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2 Sheets-Sheet 1

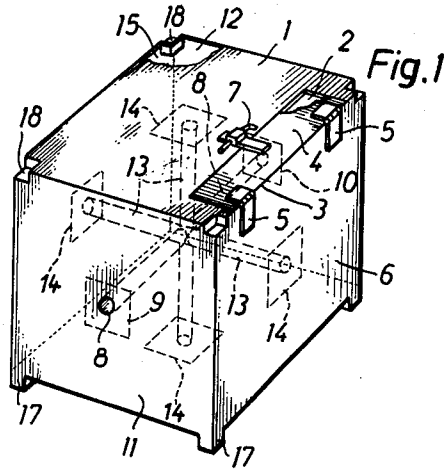


Fig.1

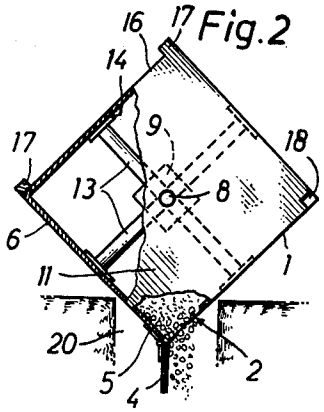


Fig.2

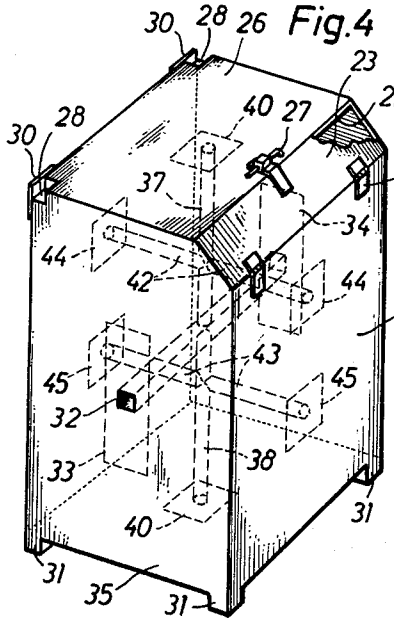


Fig.4

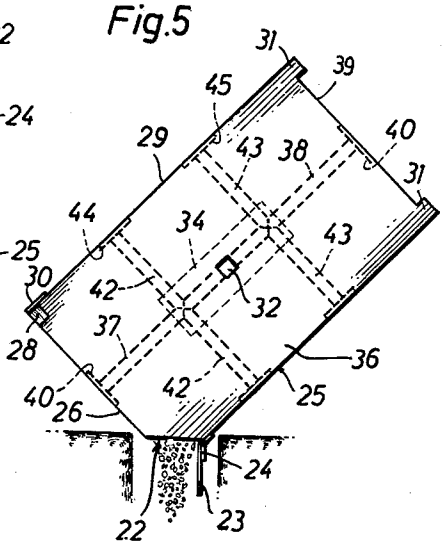


Fig.5

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Fig.3

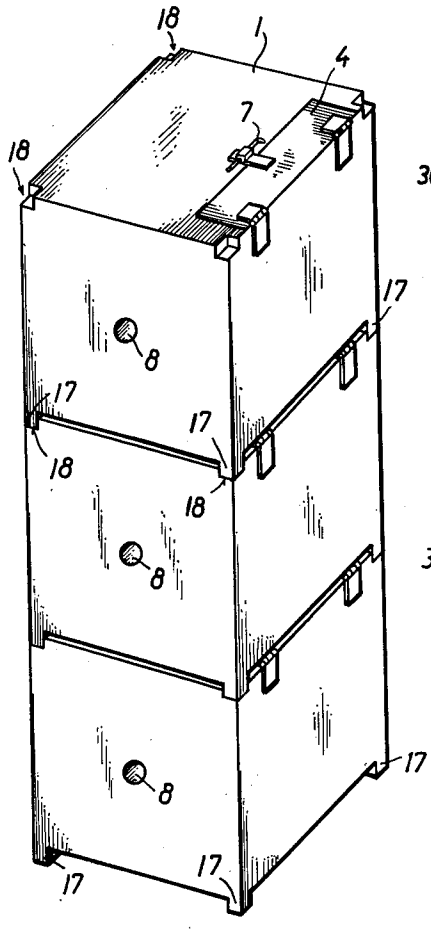
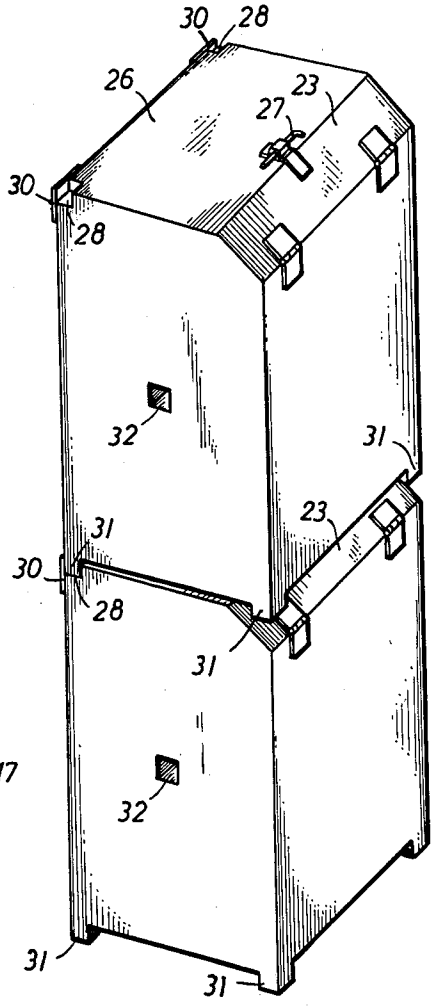


Fig.6



INVENTOR

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United States Patent Office 3,124,265
Patented Mar. 10, 1964

3,124,265
TILTABLE TRANSPORT CONTAINER FOR POURABLE BULK MATERIAL

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Filed Dec. 1, 1961, Ser. No. 156,313
Claims priority, application Germany Dec. 7, 1960
2 Claims. (Cl. 220—1.5)

The invention relates to transport containers, and more particularly to tiltable containers for pourable bulk materials.

Containers are known for pourable goods, which have on their top front edges a filling and emptying opening or aperture closable by a lid or similar closing means. The containers are tilted when the goods are to be emptied; in other words, the containers are turned around with tops down, the material flowing out after the lid has been released. With a view to facilitating the pouring of the material and/or ensuring complete emptying of the containers, these are usually shaped with portions tapering towards the opening.

It is the object of the present invention to provide an improved container of this type by dispensing with the conical taper in the region of the opening, while the container will be adapted to discharge the goods completely and speedily in the tilted position.

It is one of the major features of the invention that the container is given the shape of a parallelepipedon with substantially plane walls, the filling and/or emptying openings or apertures being provided along one of the upper edges of the container.

The substantially plane or flat walls make for simple and consequently cheap manufacture. Further advantages of the inventive container result from other features, one of which is the provision of feet at the bottom, with corresponding recesses in the top, whereby several containers may be superposed for space-saving, safe and convenient storage.

Another feature of the new container is the provision of a continuous or pairs of aligned lateral bores, preferably of quadratic cross-section, enabling the prongs of, e.g., a fork-lift truck or similar handling device to pick up, fill, transport and/or empty the container with considerable ease.

For emptying, the inventive container is tilted until the edge having the aperture provided therein is in its lowest position. The inner side and top walls adjoining the aperture will then form sloping surfaces along which the contained bulk material will easily flow towards the discharge aperture. This assures complete emptying of the container within a minimum of time.

Other objects, features and many of the attendant advantages of the invention will be readily appreciated as the same becomes better understood by reference to the following detailed description, when considered with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a cubical container according to the invention;

FIG. 2 is a side elevation of the container shown in FIG. 1, when tilted to the emptying position;

FIG. 3 shows in a perspective view three containers according to FIG. 1 stacked above each other;

FIG. 4 is a perspective view of another embodiment of the inventive container, having the shape of an upright parallelepipedon and provided with a slanting aperture;

FIG. 5 is a side elevation similar to that of FIG. 4, showing the container of FIG. 4, when tilted to the emptying position; and

FIG. 6 shows in a perspective view two superposed containers according to FIG. 4.

The preferred container embodiment illustrated in FIGS. 1–3 has a cubical shape and completely flat walls. The top surface 1 is provided with an opening or aperture 2 for filling and emptying the container. The aperture is preferably made rectangular and adjacent a top front edge 3 of the container. A lid 4 is pivotally attached by means of hinges 5 to the front wall 6; a latch 7 on the top 1 serves to immobilize the lid 4 in its closed position.

The container is traversed at mid height by a tube 8 parallel to the aperture 2 and secured with the aid of reinforcing or stiffening plates 9, 10 to respective side walls 11, 12. The tube 8 is open at its two ends, forming bores for purposes to be discussed somewhat later. From the center of tube 8, tube sections 13 with reinforcing plates 14 connect to the container top 1, the front wall 6, as well as to the remaining wall 15 and the bottom 16. Unlike the tube 8, the tube sections 13 are closed to the exterior. The tubes 8, 13 and their stiffening plates 9, 10, 14 provide sufficient support for the side walls so that they can be made of relatively thin material, without impairing the handling capability of the transport container.

The bores at the ends of tube 8, flush with the surfaces of side walls 11 and 12 of the container, are advantageously used in conjunction with prongs or suitable lifting members of fork-lift trucks, adapted to enter into the tube ends for lifting, transporting and otherwise handling of the containers. Since the tube ends and the corresponding lifting members have cylindrical cross-sections, the containers may be easily tilted by hand around the lifting members for emptying purposes, as will be described hereunder.

The container is also provided with four legs 17 at the bottom and corresponding depressions 18 at the top, into which the legs of a superposed container will fit so that several containers may be stacked in a vertical column. The legs 17 have sufficient height to allow an appropriately shaped lifting member of the fork-lift truck to reach under the container.

For filling a container, it is tilted so as to rest on the two legs 17 diagonally opposite the aperture 2 and placed, with the lid 4 open, under the discharge opening of a hopper or the like. The positioning may be accomplished by a number of conventional means, e.g., by using a rocker positioned underneath the hopper. In this tilted position, the pourable bulk material may be charged into the container. Since the latter does not present any dead space, it can be filled completely and fast with the material to be transported.

The containers may be transported by means of a truck or similar vehicle on which they rest with the legs 17. The parallelepipedonal shape allows for full exploitation of the loading surface and/or space. At the point of destination, the containers are preferably removed from the vehicle one by one and discharged, for example, by being tilted with suitable means around the bores of tube 8. After the container has been turned with the aperture 2 down, and above the feeding hole of a hopper, tank or the like, as shown at 20 in FIG. 2, the container may be lowered until the top 1 and the front 6 are approximately at 45° with respect to the horizontal. Upon releasing the latch 7, the lid 4 opens and the material is readily discharged from the conveniently sloping inner wall surfaces. The cylindrical shape of the tubes 8 and 13 does not allow the material to remain thereon, so that all of it is readily discharged from the container.

Preferably the feeding hole of the hopper or tank is so dimensioned that it is completely closed by the container in its discharge position. Thus, practically no dust or

whirling powder may emerge from the hole around the edges of the container.

The manipulation of the container can be simplified by attaching the lifting member on the forklift truck in a forwardly protruding fashion. The truck may thus approach the container with a rod-shaped lifting member penetrating the bore of tube 8, whereupon it is made to carry the container to the point of discharge where the container is tilted, e.g. by hand, around the lifting member, discharged into the hopper or tank and, finally, returned in an opposite sequence to the point of origin.

The alternate embodiment shown in FIGS. 4–6 is also of quadratic cross-section but has a height greater than its width. Furthermore, in contradistinction to the former embodiment, the front top edge of the container is cut away at approximately 45 degrees, forming thus an opening or aperture 22 (FIG. 5) adapted for charging and discharging of the material. A lid 23 is fastened by means of hinges 24 to the front wall 25, while the top wall 26 of the container has a latch 27 attached thereto. The rear corners of the top 26, opposite the aperture 22, have recesses 28 flanked by plate members 30 attached to and parallel with the rear wall 29. The bottom corners are provided with legs 31 corresponding in size to said recesses 28.

When two or more containers are superposed, as shown in FIG. 6, the rear legs 31 will be held by plate members 30 in the recesses 28 so that the upper container is immobilized. The bottom of the upper container rests on latch 27 of the lower one, the height of the latch being predetermined so that the upper container is held in a horizontal position thereon. It will be understood by those skilled in the art that, instead of the latches, separate spacing pieces (not shown) may be provided, e.g. on the top 26 of each container, preferably close to its front edge adjoining the aperture 22. Alternately, the spacing pieces may be provided on the forward bottom portions of the containers, e.g. intermediate the front legs 31.

Parallel to the opening 22, a horizontal tube 32 is secured between the side walls 35, 36 and attached thereto by means of reinforcing or stiffening plates 33, 34, respectively. Similarly to the previous embodiment, the tube 32 is stiffened by means of vertical tube portions 37, 38 connected, through stiffening plates 40, to the top 26 and the bottom 39, respectively. Owing to the greater height of these containers, additional horizontal strut tubes 42, 43 are provided at different levels, preferably at right angles to the tube 32, and secured with respective pairs of stiffening plates 44, 45 to the front wall 25 and the rear wall 29 of the container.

As in the first-described embodiment, the tube 32 is open to the exterior while the remaining tube sections 37, 38, 42 and 43 are closed. The tube 32 is made in this embodiment with a prismatic cross-section, preferably quadratic, with walls parallel to those of the container, so that in the 45-degree tilted position no material can remain on the top edge of tube 32. Another advantage of the quadratic shape is that the lifting member of the forklift truck, made to correspond to the inner dimensions of the tube bore, may be supplemented by and connected to a tilting device adapted to manipulate the container into and from the charging, transporting and discharging positions, respectively.

The operation is otherwise similar to that of the first embodiment. The aperture 22 and its closed lid 23 are substantially horizontal when the container is in the 45-degree emptying position shown in FIG. 5. Discharging the container is consequently very simple and fast.

It should be understood, of course, that the foregoing disclosure relates only to preferred embodiments of the invention and that it is intended to cover all changes and modifications of the examples described which do not constitute departures from the spirit and scope of the invention as set forth in the appended claims.

In particular, the hinges shown attached to the front walls of the containers may be applied to the top walls; or, instead of latches, as shown, other suitable and conventional closing means, like toggles or turnbuckles, may be used for securing and operating the lids.

Furthermore, it will be understood by those skilled in the art that the tubes 8 and 32 may have other cross-sections than cylindrical or quadratic. Also, they may be shaped so as to traverse the entire width of the container in an uninterrupted fashion, for ready insertion of a single lifting member or the like instead of two lateral ones or only one, single-sided lifting member.

Also, the number, shape and mode of attachment of the stiffening tubes and plates may be varied without departing from the scope of the invention. In the second embodiment, for example, a greater number of tubes may be distributed along the height of the container, parallel or perpendicular to the tube 32, and so on. The tubes may be hollow or solid, and their mode of attachment to the container walls may be varied at will. For the sake of clarity, these alternate details have not been shown in the drawings.

I claim:

1. A tiltable transport container for pourable bulk materials, said containers being in the general shape of a rectangular parallelepipedon and including a supernumerary wall portion slanted with respect to two perpendicular walls of the container, said slanted wall portion comprising a lid pivotally secured to one of the walls of the container to provide a single aperture for both filling and discharging said bulk materials, latch means for immobilizing said lid in its closed position, a hollow non-circular supporting bar braced between two opposing walls and including non-circular external apertures for receiving a cooperating non-circular tool for lifting, transporting, and discharging said container, at least two additional supporting bars braced between the remaining walls, a leg at each corner of the bottom of said container, and two recesses in the top of said container opposite said slanted wall for receiving two legs of a second container.

2. A tiltable transport container according to claim 1, further including two retainer plates secured to the rear of said container adjacent respective ones of said recesses for holding said second container.

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