

A silo according to the preamble of claim 1 is known from DE-OS 2 260 159. Such silos are used e.g. for storing cement or plaster on construction sites. They are relatively large and must therefore be transported lying down. With the known silo, when the silo is to be loaded onto a transporting vehicle, the vehicle drives up close to the silo. The loading bridge is tilted into an almost vertical position in which it projects above the silo. The top end of the silo is then attached by pull ropes to the loading bridge. When the loading bridge is lowered the silo is tilted and loaded onto the loading bridge.

The disadvantage of this silo is that an operator has to climb up on the silo to attach the pull ropes to, or detach them from, the attachment device, both during loading and unloading of the silo. The present invention eliminates this disadvantage by the characterizing features of claim 1.

When the pull rope is detached the coupling element is in its lower end position, e.g. at the shoulder height of the operator. The pull rope can therefore be easily connected to the attachment device. When the pull rope is pulled the coupling element initially slides up to the stop in the upper part of the silo, whereupon the silo can be loaded on to the transporting vehicle in the same way as the previously known silo. For unloading, the silo is initially put down in the known manner. If the pull rope is then further released the coupling element slides into its lower end position where it can again be easily detached from the pull rope.

A further silo is known from DE-OS 2 435 900 which is loaded horizontally onto a transporting vehicle and which can be positioned vertically on the ground by the latter. For this purpose an arm tiltable on a horizontal axis is attached to the rear end of the transporting vehicle. The free end of the arm engages detachably in a longitudinal track in the upper part of the silo. The attachment and detachment of the coupling between the tilting arm and the track is however even more troublesome than the rope coupling according to DE-OS 2 260 159 described above.

In the following, embodiments of the invention are explained by means of the drawings. These show:

Fig. 1 a first embodiment in elevation,

Fig. 2 a cross-section through the embodiment according to Fig. 1,

Fig. 3 a second embodiment in elevation,

Fig. 4 a cross-section through the embodiment according to Fig. 3,

and Fig. 5 to Fig. 7 show the steps for loading the silo according to the invention.

In the embodiment according to Fig. 1 and 2 two support channels 4 are attached to the side wall 3 of the silo container 2, these serve as legs when the silo is standing and as a support during transportation. A guide rod 20 is attached laterally to each of the supporting channels 4. The upper end of the rod 20 is bent at an angle. The angling 21 forms a stop 6 and is reinforced by a plate 22 which is attached by a connecting block 23 to the channel 4. The lower end of the rod 20 is likewise connected by a spacer 24 to the channel 4.

The rod 20 is embraced by a coupling element 7 which in the embodiment according to Fig. 1 and 2 consists of two parallel plates 27 which are rigidly connected to each other by two studs 28, 29. The rod 20 is arranged with play in the space between the plates 27 and the studs 28 and 29 so that the coupling element 7 can slide along the rod 20 between the spacer 24 and the upper stop 6. On one plate 27 a sleeve 33 is fastened in which a bolt 31 provided with a hand-grip 32 is guided. The bolt 31 is pre-loaded by a spring in the sleeve 33 in the initial position shown, in which it projects into a hole in the opposite plate 27. By pulling the hand-grip 32 in the direction of the arrow (Fig. 2) an end loop of a pull rope 8 can be coupled with or uncoupled from the coupling element 7.

The silo 1 according to Fig. 3 and 4 also has two support channels 4 attached to the side wall 3 of the silo container 2. Here the guideway 5 consists of a tube 40 with a longitudinal slit and a circular cross-section which is welded to the side of the support channel 4. At the top an impact block 41 and at the bottom a further impact block 44 for the coupling element 7 are attached to the channel 4. The coupling element 7 includes a rod 41 from which a ridge 42 stands out radially and which is guided with play in the tube 40. The ridge 42 projects through the slit 43 of the tube 40 and is connected in a hinged manner by a stud 44 to two plates 45 which are riveted together by a further stud 46. To one plate 45 a sleeve 47 is again attached in which a bolt 49 provided with a handgrip 48 is guided. The bolt 49 is pre-loaded by a spring in the position shown in which it projects into a hole in the opposite plate 45. The operation of the coupling element 7 according to Fig. 3 and 4 is the same as for Fig. 1 and 2.

The procedure for loading the silo 1 onto a transport vehicle 12 is shown in Fig. 5 to 7. First the vehicle 12 reverses until it is close

to the silo 1 and tilts its loading bridge 13 by means of two telescopic cylinders 14 into an almost vertical position. The pull ropes 8 are released far enough for it to be possible to couple their end loops to the coupling elements 7 which are in their lower end position (Fig. 2 and 4). The ropes 8 are then partly drawn in (Fig. 6) such that the coupling elements 7 slide upwards along the guideways 5. The vehicle 12 is reversed slightly until it almost touches the silo 1. The ropes 8 are drawn in again until the coupling elements 7 come in contact with their upper stops 6. When the loading bridge 13 is lowered the silo 1 is tilted by the ropes 8 (Fig. 7) and finally loaded onto the loading bridge 13 such that it rests with its supporting channels 4. Unloading is carried out in the reverse manner.

Claims

1. Silo with an attachment device (5-7) for fixing the silo by its upper part to a tiltable loading bridge of a transport vehicle, characterized in that the attachment device (5-7) includes at least one guideway (5) arranged longitudinally on the silo container (2) with a stop (6) in the upper region of the silo, and a coupling element (7), which can be slid along the guideway (5), for a rope (8).
2. Silo according to claim 1, characterized in that the attachment device (5-7) comprises two parallel guideways (5) each with a slidable coupling element (7).
3. Silo according to claim 1 or 2, characterized in that the guideway (5) includes a rod (20) arranged parallel to the side wall (3) of the silo container (2), which is attached at both its ends to a support channel (4) connected to the silo container (2), and which the coupling element (7) embraces with play.
4. Silo according to claim 3, characterized in that the rod (20) is bent at an angle on its upper end to form the stop (6).
5. Silo according to claim 1 or 2, characterized in that the guideway (5) is a slotted hollow channel (40) connected to the silo container (2), in which the coupling element (7) is carried such that it is slidable.
6. Silo according to claim 5, characterized in that the hollow profile is a slotted tube (40) with a circular cross-section, that the coupling element (7) has a cylindrical rod (41) carried with play in the tube (40), from which a ridge (42), which projects through the slit in the tube (40), stands out radially.
7. Silo according to claim 5 or 6, characterized in that the hollow profile (40) is attached to a support channel profile (4) which is connected to the silo container (2).

