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Method for unloading bulk freight from a cargo body or container as well as cargo body or container for carrying out the method

The invention relates to a method of unloading bulk freight from a cargo body or container or other storage space.

It is known, e.g. from US Patent 3,868,042 to provide a foil in the form of a bag which is located within the cargo body or container to serve as protection for the contents. Unloading is carried out by positioning the cargo body or container in an inclined position by means of a lifting apparatus so that the bulk freight may slide outwards over an unloading edge. Such lifting apparatuses are not provided everywhere and often represent a complication.

With stationary storage spaces, such as silos, unloading is carried out with a hopper requiring much space and in which arching may occur with the result that unloading is interrupted.

The invention seeks to provide a method by which it is possible to remove the bulk freight from a cargo body or container in a quick and efficient way without the necessity to position this in an inclined position, and by which it is also possible to unload bulk freight from a stationary storage space without the use of a hopper and without interruption.

According to the invention there is provided a method for unloading bulk freight from a cargo body or container or other storage space having a bottom and a wall located opposite an unloading edge, wherein, prior to filling, a foil is provided over at least the bottom and a portion of the wall opposite the unloading edge, which foil for unloading purposes is pulled out over the unloading edge, the foil being laid down over the bottom in a sequence of folds.

For unloading one needs only to pull the foil outwards, and the folds provide that, as far as the

corner most remote from the unloading edge, the cargo of bulk freight resting on the foil moving outwards may be advanced. After unfolding the foil lying on the bottom, the foil engaging the wall opposite the unloading edge
5 is pulled into an inclined position, by which the final remainder of the material can be fed outwards.

In order to obviate too heavy loads on the foil by the cargo and too high friction forces it is of importance to define accurately the number and length
10 of the folds and it is preferred that the number of folds per running meter and/or the length of the folds increase from the unloading edge to the opposite wall in order that an advanced portion is unloaded before the subsequent should start to move.

15 With a large spacing between the unloading edge and the opposite wall and with certain sorts of bulk freight it may be necessary that the foil is extended as far as the upper edge of the wall opposite the unloading edge and eventually further along a roof
20 located above the bottom as far as an edge above the unloading edge so that the cargo is brought completely to the unloading edge after the greatest part has been unloaded by unfolding the foil lying on the bottom.

When it is unloaded along a short distance, for
25 example over a longitudinally extending long side edge, then usually it suffices to have a foil extending maximally up to the upper edge of the side wall opposite of the unloading edge and a foil engaging against the upper wall is not necessary.

30 The invention also provides a cargo body or container suitable for use in carrying out the method according to the invention, a foil being laid down over the bottom of the cargo body or container in a sequence of folds, said cargo body or container having at the unloading edge a
35 device with a roller which can be driven and by means of

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which the foil can be pulled out of the cargo body or container, and said device comprising clamping rollers positioned in a support which can be placed in the cargo body or container under a screen having a slide
5 surface to the contents and can be placed outside the cargo body or container. With the support located in the cargo body or container, the foil is clamped with its starting end between the rollers, the cargo can be completely enclosed by the foil, while the rollers are
10 screened with respect to the cargo. The slide surface provides that the bulk freight above the slide surface will be discharged with certainty.

Preferably, said support is so arranged that the rollers are located beneath a curved guiding surface for
15 the foil, and the -----

support has storage space for the foil beneath the rollers.

Now, the invention will be explained in details with reference to the drawings.

Fig. 1 shows in a perspective view a vehicle having a cargo
5 body with a removed side wall.

Fig. 2 is a longitudinal section through the cargo body in closed condition.

Fig. 3 shows the cargo body according to the invention during unloading.

10 Fig. 1 illustrates a truck 1 with trailer 2 on which a container 3 is positioned. On the bottom of the container a foil 4 is laid down, which extends upwards along the front wall at 5, as well as along the roof at 6 and meets at 7 a screen 8 to be described in detail and provided with filling apertures 9.

15 As it appears more clearly from Fig. 2 the foil 4 is laid down on the bottom 10 of the cargo body into a high number of folds extending upwards at 5 along the front wall 11, while at 6 the foil engages the roof 12 of the cargo body. The folds overlap each other such that always the upper portion of a fold is pulled
20 away over the underlying portion so that unfolding is decelerated as little as possible. This would be the case when one should pull a fold portion lying beneath and especially when said portion lies beneath a fold portion loaded by the cargo.

Said foil can be maintained in its position against the front
25 wall 11 and roof 12 by means adapted thereto, such as self-adhesive glues, tangle tape, press-studs etc., i.e. means adapted to carry the weight of the foil but being able to permit to pull loose easily.

At 7 the end of the foil is fixed to a screen 8 in the form
30 of a cross-beam having an inclined guiding surface 13. Under said screen 8, 13 a support 14 is located having two rollers 15 to be driven. The foil extends, as indicated at 16, upwards along the front wall 17 of the support and over the curved guiding surface 18 to the rollers 15. Thereby, the cargo is enclosed completely
35 by the foil as well as by the screen 8, 13.

Fig. 3 shows the situation during unloading. The support 14 is removed from the container now permitted after opening the doors 19 shown in Fig. 1 and said support is placed on the bottom.

Thereby the unloading aperture is opened and some bulk freight flows outwards.

When the rollers 15 are driven now the foil material under the cargo is pulled outwards and carries along said cargo in this way as indicated in Fig. 3. During this, the foil is enclosed in the support as indicated at 20.

By the line 21 the slope is indicated as it can be formed during unloading in this way.

When the foil is pulled completely taut over the bottom 16, the portion 5 (Fig. 2) will be unfolded and after this occurrence the foil will be pulled from the roof 12 until a condition is attained as approximately indicated by the interrupted line 22. Then, the cargo is completely removed from the container. In many cases, however, it will be sufficient that the foil 4 is extending over bottom 10 and only a portion of front wall 11.

It will be clear that the invention can also be used with a cargo body open at the upper side even with a foil covering the cargo at the upper side and it will also be clear that the principle of unloading with the unfolding foil can be used when the upper side of the cargo is not covered with a foil respectively no foil is provided against the under side of the roof, but the foil is only located on the bottom and against the wall 11 opposite of the unloading edge.

The foil providing for the unloading of the cargo in the method according to the invention may as shown lie directly on the bottom respectively against a side wall respectively the roof of the cargo body or container. However, said foil may also be provided when the walls and the bottom of the cargo body or container have already been covered respectively are covered with a covering foil, for example in the way as disclosed in the U.S. patent 3,868,042.

Of course, the foil should be sufficiently strong for accommodating the tensile load during unloading. Such a foil may consist of materials suitable for that purpose, such as plastic, webs of textile material and the like.



CLAIMS:

1. A method for unloading bulk freight from a cargo body or container or other storage space having a bottom and a wall located opposite an unloading edge, wherein, prior to filling, a foil is provided over at least the bottom and a portion of the wall opposite the unloading edge, which foil for unloading purposes is pulled out over the unloading edge, the foil being laid down over the bottom in a sequence of folds.
2. A method according to claim 1, wherein the number of folds per running meter and/or the length of the folds increase from the unloading edge towards the opposite wall.
3. A method according to claim 1 or 2, wherein the foil is extended from the upper edge of the wall opposite of the unloading edge along a roof located above the bottom as far as an edge above the unloading edge.
4. A cargo body or container suitable for use in carrying out the method according to any one of the preceding claims, a foil being laid down over the bottom of the cargo body or container in a sequence of folds, said cargo body or container having at the unloading edge a device with a roller which can be driven and by means of which the foil can be pulled out of the cargo body or container, and said device comprising clamping rollers positioned in a support which can be placed in the cargo body or container under a screen having a slide surface facing to the contents and can be placed outside the cargo body or container.

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5. A cargo body or container as claimed in claim 4, wherein the rollers are located inside the support below a curved guiding surface for the foil, and the support has storage space for the foil beneath the rollers.

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6. A cargo body or container according to claim 4 or 5, wherein the foil is laid down with the number of folds per running meter and/or the length of the folds increasing from the unloading edge towards the opposite wall of the
10 cargo body or container.

7. A cargo body or container according to claim 4, 5 or 6, wherein the foil is extended from the end of the bottom opposite the unloading edge upwardly over an end
15 wall and then along a roof of the cargo body, the foil being attached to the roof at a position above the unloading edge.

8. A method of unloading bulk freight from a cargo body
20 or container according to claim 1 and substantially as herein described.

9. A cargo body or container substantially as herein described with reference to the accompanying drawings.
