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54 **Flexible container for transporting and storing bulk goods, and procedure for closing the open upper part of flexible container.**

57 The present invention concerns a flexible container for transporting and storing bulk goods. The container (10b) comprises a mantle (11), a bottom (13), and a filling aperture (12). The container (10b) is provided with at least one lifting loop (14) for lifting said container (10b). In the upper part of the mantle (11) of the flexible container (10b) is formed at least one auxiliary slit (17), through which the lifting loop (14,15) gathered together in its lifting area can be taken, whereby the lifting loop (14,15) taken through the auxiliary slit (17) is turnable upside down in order to close the open upper part (12) of the flexible container (10b) when the material cloth of the upper part of the flexible container (10b) crosses 9.

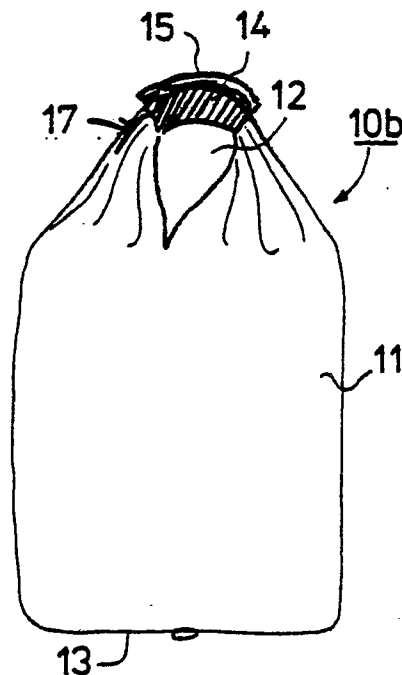


FIG. 3

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The present invention concerns a flexible container for transporting and storing bulk goods, said container comprising a mantle, a bottom and a filling aperture, and said container being provided with at least one lifting loop for lifting the container.

The invention also concerns a procedure for closing the open upper end of the flexible container, said container comprising a mantle, bottom and a filling aperture, and being provided with at least one lifting loop for lifting the container.

This kind of container is disclosed in the earlier Finnish Patent No. 57 382 of the applicant. Said flexible container of prior art can be manufactured either from a blank of one woven piece of the material, which is first bent over around the centreline, or from circular woven hose-like blank. Said known maxibag, just like also the other maxibags in current use are manufactured from generally circular woven polypropylene cloth. In said known design, the joining seams of the strip-like parts constituting the bottom of the container are sewing seams which are arranged to extend at a substantial space from the centre area of the bottom.

In the earlier Finnish patent No. 61 174 of the applicant is presented a maxibag made from hose-like blank for transporting and storing bulk goods, which maxibag comprises a mantle and a bottom, and a filling aperture, which maxibag can be lifted at the upper end and in the mantle of which maxibag have been produced pleats, the lower parts thereof being bent in the plane of the maxibag bottom, and the upper plane of the pleat bent in the plane of the maxibag bottom has been attached to the lower plane of the pleat. The free lower edge of the hose-like blank is closed with a bottom seam which is substantially positioned in the centre area of the container bottom, and the upper level of the pleat has been attached to the lower level of the pleat by means of a joining seam which is disposed to provide better strength at the bottom of the container by transferring the stress forces from the middle area of the bottom to the marginal area of the bottom.

In the earlier Finnish patent No. 68 590 of the applicant is disclosed an equivalent maxibag of the patent No. 61 174, but the maxibag as that disclosed in the patent No. 68 590 is provided with at least one support seam substantially paralleling the bottom seam on both sides of the bottom seam, its distance being less than half of the half distance of the joining seam.

In the earlier Finnish patent No. 57 381 of the applicant is disclosed a flexible container for transporting and storing bulk goods, said container comprising a mantle, and a filling aperture, and being provided with lifting loops for lifting the container. The lifting loops of the container have been composed of strip-like parts which are straight exten-

sions to the upper part of the container mantle. The strip-like parts have been connected with connecting seams so that the connecting seams are disposed to extend at a substantial distance from the centre area of the said lifting loops.

In the earlier Finnish patent No. 60 175 of the applicant is disclosed a flexible container for transporting and storing bulk goods, said container comprising a mantle, a bottom and a filling aperture. The container is provided with lifting loops for lifting the container, and the lifting loops have been formed from strip-like parts which are straight extensions to the upper part of the container mantle and which strip-like parts are mutually connected with at least one connecting seam. The strip-like parts are pleated strip-like parts provided with the lower plane and the upper plane of the pleat, said pleated strip-like parts being arranged to overlap each other.

In the above maxibags known in the art a so-called inner bag is used inside the maxibag. The inner bag is filled with bulk goods by means of filling apparatus known in themselves in the art, whereafter the upper part of the inner bag is closed. Each lifting loop of the maxibag is separately pressed together and surrounded e.g. with strong tarpaulin or sleeve-like pieces of material, whereby the lifting of the maxibag is safe. Alternatively, the lifting loops of the maxibag can be gathered to one lifting loop construction surrounded e.g. with tarpaulin tape, strings or sleeve-like material pieces.

In the upper part of the maxibags known in the state of art has thus been formed a filling / lifting slit for maxibag filling and for lifting loops. This results in the drawback that the upper part of the maxibag becomes open. The openness of the upper end of the maxibag causes numerous drawbacks. When storing maxibags, people walk on top of the maxibags and the cloth material of the maxibag is not protecting the inner bag. The wind enters easily the open upper part and blows and tears the lifting part and also causes abrasion between the inner and outer bag. Snow, water, ice and impurities may enter into the open upper part and when the maxibag is emptied, they go with e.g. fertilizer. If the maxibag overturns, the inner bag with bulk goods runs easily out. When lifting the fallen bag up, the lifting hook moves easily to a wrong place and away from the lifting part, whereby the treatment of the bag becomes risky.

Problems like those described above do not occur in maxibags of older design in which in the upper part of the maxibag no lifting loops are used. In maxibags of this type the upper part of the maxibag is gathered together and closed with a rope which at the same time forms a lifting loop. The greatest drawback in said old-fashioned max-

ibags has been the safety risk related to lifting maxibags. Therefore, the old-fashioned maxibags are no longer in general use, instead, maxibags provided with lifting loops are nowadays mainly used.

Endeavours have been made to enhance the openness of the upper part of the maxibag e.g. using the design disclosed in the Finnish patent applications Nos. 863248 and 863249. In said design known in the art a tubular material piece of flexible material has been preferably placed which separates the part of the maxibag from the lifting loops which is filled with bulk goods. The material piece is attached to the edges of the filling / lifting slit. By means of said design known of prior art the open upper part of the maxibag may, of course, be closed, but the design requires use of additional material and extra joining work.

The object of the invention is to provide an improvement in problems related to the openness of the maxibag upper part and to solve said problem in a simpler, and in a more preferable way regarding its production costs.

The aims of the invention are achieved by means of a maxibag which is mainly characterized in that the lifting loop of the flexible container gathered together from its lifting area is conveyable through the cloth material of the lifting part, or through an aperture or apertures made therein, whereby the through-taken lifting loop is overturnable for closing the open upper part of the flexible container while the material cloth of the upper part of the flexible container crosses.

In an advantageous embodiment of the invention the upper part of the mantle of the flexible container is provided with at least one auxiliary slit through which the lifting loop gathered together in its lifting area can be taken, whereby the lifting loop taken through the auxiliary slit can be overturned for closing the open upper part of the flexible container while the material cloth of the upper part of the flexible container crosses.

The procedure of the invention is mainly characterized in that the lifting loop of the flexible container gathered together in its lifting area is taken through the cloth material of the lifting part, or an aperture or apertures made therein, and that the through-taken lifting loop is overturned, whereby the material cloth of the upper part of the flexible container crosses and closes the lifting and/or filling slit or slits.

The problems caused by the openness of the upper part of the maxibag of the invention have been solved in as simple manner as possible, whereby numerous significant advantages are gained with the invention. Weakening of the maxibag is not caused by the design of the invention, nor is the production of the maxibag retarded

therethrough. The design of the invention closes the open upper part of the maxibag with sufficient reliability and in this manner protects the maxibag against impurities, water, ice and snow, and prevents the tearing effect of the wind. In addition, the design of the invention hinders bulk goods from running out of the maxibag, which is particularly important in transporting hazardous substances. Similarly, when lifting the bag up, the lifting loop is preferably maintained in the lifting area. After the lifting, the lifting part of the bag stays better in upright position because of the rigidity of the gathered cloth material. Since the design of the invention requires no additional investments, remarkable savings in production costs are achieved with the design of the invention.

The invention is described in detail, referring to an advantageous embodiment of the invention in the figures of the accompanying drawings, to which, however, the invention is not intended to be exclusively confined.

Figure 1 presents axonometrically a commonly used embodiment of the maxibag of state of art.

Figure 2 presents axonometrically a second commonly used embodiment of the maxibag of state of art.

Figure 3 presents in schematical elevational view an advantageous embodiment of the maxibag of the invention.

Figure 4 presents the embodiment of Fig. 3 when the open upper part of the maxibag has been closed.

Figure 5 presents a bag blank of the maxibag of the invention in schematical elevational view.

The maxibag known in the state of art, presented in Fig. 1, is generally indicated by reference numeral 10. The maxibag 10 comprises a mantle 11, a filling / lifting aperture 12, a bottom 13, and lifting loops 14. Each of the lifting loops 14 has been pressed together individually in a manner known in itself in the art and surrounded in the lifting area with strong tarpaulin tape 15. The maxibag 10 as shown in Fig. 1 is provided with an inner bag as is known in the art (not shown).

The maxibag known in the art, presented in Fig. 2, is generally indicated by reference numeral 10a. The maxibag 10a differs from the maxibag of Fig. 1 only in that the lifting loops/loop 14 are/is first gathered together, and the gathered loop construction is surrounded with strong tarpaulin tape 15, cloth, or by some other means. The inner bag of the maxibag 10a is indicated by reference numeral 16.

The maxibag of the invention presented in Figs 3 and 4 is generally indicated by reference numeral 10b. The maxibag 10b is otherwise similar to the maxibag 10a presented in Fig. 2, but in the maxibag 10b of Fig. 3 an auxiliary slit 17 has been

made in the upper part of the mantle 11 of the maxibag 10b. The open upper part 12 of the maxibag 10b can be closed by bringing the hand into the auxiliary slit 17 and taking the lifting loop 14 surrounded with the tarpaulin tape 15 through the auxiliary slit 17, whereby the lifting loop 14 turns, as if upside down, whereby the open upper part 12 of the maxibag 10b closes when the material cloth of the upper part of the maxibag 10b crosses. The lifting loop 14 of the maxibag 10b also acts in the position shown in Fig. 4 normally as the lifting loop of the maxibag 10b. The through-taking through the auxiliary slit 17 may, in fact, be accomplished also by the aid of an appropriate mechanical auxiliary device. It is normally preferable to carry out the through-taking right with the filling step, though it can be done, if required, as early as in the production step.

Also the cutting of the auxiliary slit 17 is possible e.g. after the filling step.

The invention may, of course, be applied also in the 2-lifting loop structure of Fig. 1 by connecting first the lifting loops 14 with tape 15 or equivalent. Hereby, the remaining slit parts of the central slit, that is, the filling aperture 12, serve as so-called auxiliary slits, through which the lifting loop 14 can be turned upside down as described above.

As shown in Fig. 5. the design of the invention can be accomplished most preferably in the maxibag production line with the cut-off or press machine by doing into the mantle 11 of a maxibag blank an auxiliary slit 17 in addition to the conventional filling / lifting slit 18, for instance in the bottom of the pleat of the pleated maxibag. In practice, for the length of the auxiliary slit 17 about 20 cm is enough. As shown in Fig. 5, a bottom seam 19 known in itself is formed in the bottom of the maxibag blank.

An advantageous embodiment of the invention presented in Figs 3 to 5 is applied in the so-called 1-lifting loop construction. The basic idea of the invention may, in fact, be also applied in the 2-lifting loop construction of Fig. 1 whereby an individual auxiliary slit 17 must be made for each lifting loop 14. In the design of the invention, at least one auxiliary slit 17 is needed. There may be provided, of course, two or even more auxiliary slits 17, depending on the lifting loop construction.

In certain embodiments the open upper part 12 of the maxibag 10b of Fig. 3 can be provided with a link 20 or string which after turning the lifting loop 14 is bound to the through-point of the cloths, that is, in the narrowest point. When the maxibag 10b is lifted, this kind of link, or string, becomes suitably tightened around the closed upper part of the maxibag 10b.

The basic idea of the invention may also be applied in the 2-lifting loop design of Figure 1 in

the following alternative embodiment. In the upper part of the mantle 11 of the flexible container 10, an auxiliary slit is formed through either filling aperture 12 by gathering the lifting loops 14 first together and carrying the lifting loop 14,15 gathered in its lifting area through either produced auxiliary slit 17, whereby the lifting loop 14,15 taken through the auxiliary slit 17 can be turned upside down in order to close the open upper part 12 of the flexible container 10 when the material cloth of the upper part of the flexible container 10 crosses. Thus, in said alternative embodiment, no separate slit 17 need be formed, but the auxiliary slit 17 is composed of the remaining slit parts of the filling aperture 12 which act as auxiliary slits 17 of the invention.

The basic idea of the invention can be applied in the 2-lifting loop design shown in Fig. 1 also by means of a second alternative embodiment. The separate lifting loops 14 are turned 180° inwards through the lifting / filling aperture 12, whereby the material cloth of the upper part of the flexible container 10 crosses and closes the lifting / filling aperture 12. In said embodiment, the lifting loops 14 are thus not actually turned upside down. Said embodiment may further be intensified by carrying a separate lifting loop 14 after said turning of the lifting loops 14, whereby the lifting loops 14 stay together and cover the upper part. The lifting loops 14 may after being turned be advantageously connected with tape, cloth, string, or equivalent.

In all embodiments of the invention presented above the tightness of the crossed material can be increased by using tape, glue or equivalent. This is done so that such junctures would not be exposed to loading.

In the embodiment examples presented in the figures of the drawing, the lifting loops 14 are surrounded e.g. with tarpaulin tape 15, strings, or pieces of cloth. This is not, however, necessary with a view to the implementation of the invention because the lifting loop design 14 alone may be conveyed through the auxiliary slit 17 of the invention.

In the foregoing, only the principle design of the invention and some possible modifications are presented. It is obvious to a person skilled in the art that the details of the invention may vary within the scope of the inventive idea presented in the accompanying claims.

The present invention concerns a flexible container for transporting and storing bulk goods. The container (10b) comprises a mantle (11), a bottom (13), and a filling aperture (12). The container (10b) is provided with at least one lifting loop (14) for lifting said container (10b). In the upper part of the mantle (11) of the flexible container (10b) is formed

at least one auxiliary slit (17), through which the lifting loop (14,15) gathered together in its lifting area can be taken, whereby the lifting loop (14,15) taken through the auxiliary slit (17) is turnable upside down in order to close the open upper part (12) of the flexible container (10b) when the material cloth of the upper part of the flexible container (10b) crosses 9.

Claims

1. A flexible container for transporting and storing bulk goods, said container (10) comprising a mantle (11), a bottom (13), and a filling aperture (12), and said container (10b) being provided with at least one lifting loop (14) for lifting the container (10b), characterized in that the lifting loop (14,15) of the flexible container (10b) gathered together in its lifting area can be taken through the cloth material of the lifting part, or an aperture / apertures (12,17), whereby the through-taken lifting loop (14,15) can be turned upside down in order to close the open upper part (12) of the flexible container (10b) when the material cloth of the upper part of the flexible container (10b) crosses.
2. A flexible container according to claim 1, characterized in that the upper part of the mantle (11) of the flexible container (10b) is provided with at least one auxiliary slit (17), through which the lifting loop (14,15) gathered together in its lifting area can be taken, whereby the lifting loop (14,15) taken through the auxiliary slit (17) can be turned upside down in order to close the open upper part (12) of the flexible container (10b) when the material cloth of the upper part of the flexible container (10b) crosses.
3. A flexible container according to claim 1, characterized in that in the upper part of the mantle (11) of the flexible container (10) has been formed an auxiliary slit from the filling aperture (12) by gathering the lifting loops (14) first together and by taking the lifting loop (14,15) gathered together in its lifting area through the produced auxiliary slit, whereby the lifting loop (14,15) taken through the auxiliary slit (17) can be turned upside down in order to close the open upper part (12) of the flexible container (10) when the material cloth of the upper part of the flexible container (10) crosses.
4. A flexible container according to claim 2, characterized in that the length of the auxiliary slit (17) is about 20 cm.
5. A flexible container according to any of of claims 1 to 4, characterized in that the open upper part (12) of the flexible container (10,10b) is provided with link or string (20).
6. A flexible container according to claim 2,4 or 5, characterized in that the lifting loops (14) are first gathered together and the gathered lifting loop construction is surrounded with a material piece (15) in the lifting area.
7. A procedure for closing the open upper part of a flexible container, said container (10b) comprising a mantle (11), a bottom (13), and a filling aperture (12), and said container (10b) being provided with at least one lifting loop (14) in order to lift the container (10b), characterized in that the lifting loop (14,15) of the flexible container (10b), gathered together in its lifting area, is taken through the cloth material of the lifting part or through the aperture / apertures (12,17) made therein, and that the through-taken lifting loop (14,15) is turned upside down, whereby the material cloth of the upper part of the flexible container (10b) crosses and closes the lifting and/or filling slit or slits (12).
8. A procedure according to claim 7, characterized in that the lifting loop (14,15) is taken through an auxiliary slit (17) formed in the upper part of the mantle (11) of the flexible container (10b).
9. A procedure according to claim 7, characterized in that the lifting loop (14,15) is taken through the lifting and/or filling slit or slits (12) already existing in the upper part of the flexible container (10b).
10. A procedure for closing the open upper part of a flexible container, said container (10) comprising a mantle (11), a bottom (13), and a filling aperture (12), and said container (10) being provided with lifting loops (14) for lifting the container (10), characterized in that the lifting loops (14) of the flexible container (10) are turned 180° inwards through the lifting / filling aperture (12), whereby the material cloth of the upper part of the flexible container (10) crosses and closes the lifting / filling aperture (12).
11. A procedure according to claim 10, characterized in that a second separate lifting loop (14) is taken after turning said lifting loops through a second separate lifting loop (14), whereby lifting loops (14) stay together and cover the

upper part.

- 12.** A procedure according to any one of claims 7 to 11, characterized in that the density of the crossed material cloth is increased using tape, glue, or equivalent. 5

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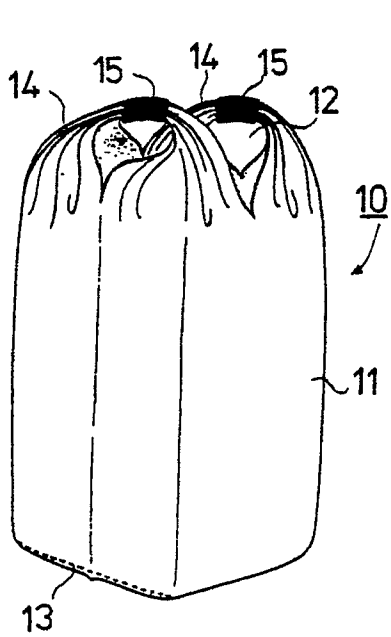


FIG. 1

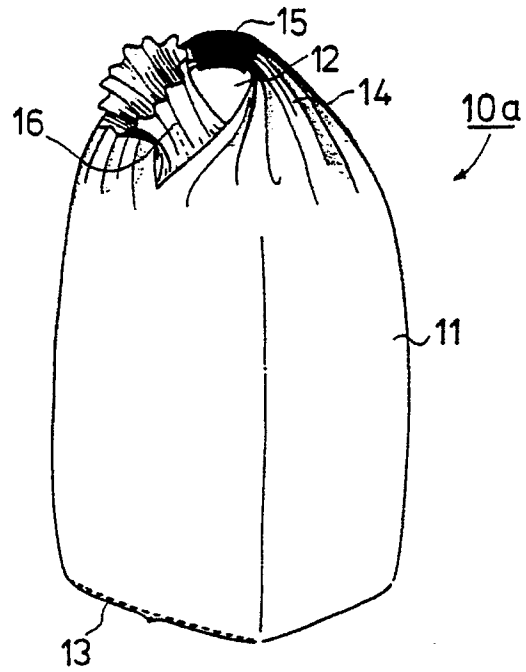


FIG. 2

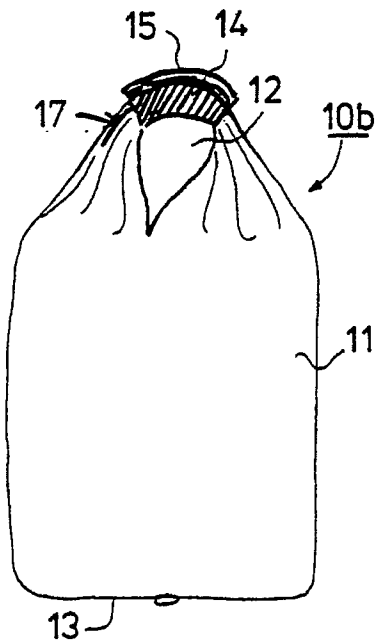


FIG. 3

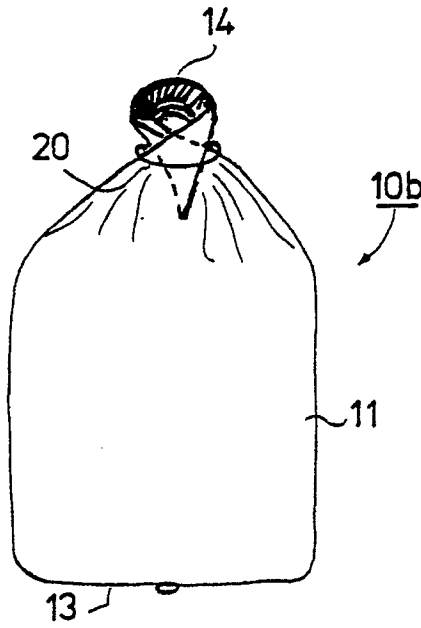


FIG. 4

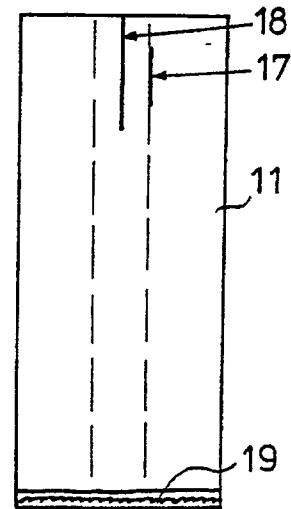


FIG. 5



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 90111019.7
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	<u>WO - A1 - 89/00 957</u> (CARLSSON) * Totality; esp. fig. 1-4 * ---	1	B 65 D 33/16 B 65 D 88/16 B 65 D 33/14
A	<u>EP - A1 - 0 183 573</u> (PAPETERIE DE L'EST) * Totality * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5) B 65 D 30/00 B 65 D 33/00 B 65 D 37/00 B 65 D 88/00 B 65 D 90/00
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
VIENNA	29-05-1991	CZUBA	
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