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(54) **Paper sack comprising a combination of sack kraft paper and recycled containerboard paper**

(57) The present invention relates to Paper sack, in particular for fine-grained bulk material such as cement, gypsum, granulate, animal feed etc., comprising at least a front portion and a rear portion, wherein said portions

delimit an interior volume, wherein the material forming said portions comprises a first layer and a second layer, wherein the first layer is formed of sack kraft paper and wherein the second layer is formed of recycled containerboard paper.

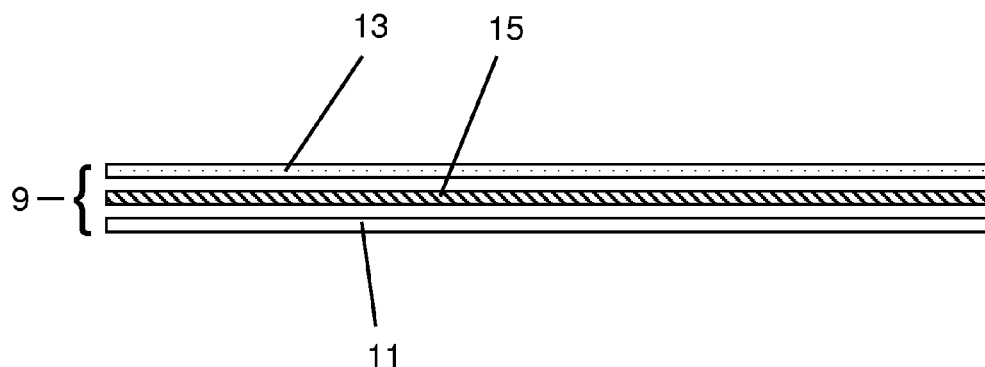


Fig. 2

Description

[0001] The present invention relates to a paper sack, in particular a paper sack for fine-grained bulk material such as cement, gypsum, granulate, animal feed etc. The paper sacks may be configured as valve sacks or open mouth sacks which are sewn, pasted or folded, but the invention is not limited to these types of sacks.

[0002] Such paper sacks may comprise a bottom portion, an upper portion, a front portion and rear portion, which delimit an interior volume, and it is known from the prior art that the material for these portions are generally composed of a plurality of layers of sack kraft paper. The latter is formed of softwood sulfate pulp and comprises comparatively long fibers so that it has a high tensile strength. This can be expressed by the TEA index as defined in ISO No. 1924-3.

[0003] In many cases already a single layer of such a sack kraft paper would suffice to provide the necessary tensile strength to prevent the resulting sack from being torn open under the load of the product contained therein.

[0004] However, it is required that the material of the paper sacks also has a minimum thickness/stiffness so as to be suitable to be handled on the machines producing the sacks and on the filling machines. Usually sack kraft paper has a high tensile strength as outlined above but the stiffness is relatively low. In order to solve this problem, usually a plurality of sack kraft paper layers are combined which results in a material having a high tensile strength as well as a sufficient thickness/stiffness.

[0005] The problem with such a material is that the costs for sack kraft paper are comparatively high and also from an environmental point of view the use of a high amount of such natural paper is disadvantageous.

[0006] Therefore, it is the object of the present invention to provide a paper sack which can be produced with lower costs and which avoids environmental disadvantages.

[0007] The afore-mentioned object is achieved by a paper sack comprising at least a front portion and a rear portion, wherein said portions delimit an interior volume, wherein the material (9) forming said portions comprises a first layer and a second layer, wherein the first layer is formed of sack kraft paper and wherein the second layer is formed of recycled containerboard paper.

[0008] The present invention bases on the idea that already a single layer of sack kraft paper preferably having a grammage, i.e. a weight per unit area, between 60 g/m² and 120 g/m², suffices to provide a certain level of tensile strength that is sufficient for most of the products filled in the sacks, and that for the handling of a paper sack it is only required that in addition to that level of tensile strength a certain thickness/stiffness must be obtained. For the latter purpose it has been recognized by the inventors that recycled containerboard paper, in particular Testliner and/or Fluting material, can be used although its tensile strength is comparatively low which in principle prevents it from being used in paper sack ma-

terial. Hence, even though recycled containerboard paper has properties so that at the first sight it appears that it is unsuitable for the use in paper sacks, the invention employs such a paper. This results in the necessary stiffness of the entire material required to handle the material during production and filling of the sacks.

[0009] In conclusion, due to the use of recycled containerboard paper for the second layer rather than sack kraft paper the present invention provides for a more cost-effective and environmentally advantageous way of producing paper sacks.

[0010] Here, it should be noted that in addition to the first and second layers the material forming the portions of the sack may comprise further layers such as third and fourth layers. Furthermore, the first or the second layer may form that layer which directly faces the inner volume. However, it is also conceivable that the first and second layers are inside the material and do not have direct contact with the inner volume.

[0011] In a preferred embodiment of a sack having only two layers the sack kraft paper which forms the first layer, has a TEA index of at least 1.3 J/g (MD and CD).

[0012] In order to ensure that the paper sack can properly be produced and handled, it is preferred that the recycled containerboard paper for the second layer has a grammage of 70 - 120 g/m². In this regard, a further preferred embodiment of a paper sack according to the present invention is formed of a material which has an overall stiffness of at least 55 mN according to ISO 2493.

[0013] Since recycled containerboard paper is permeable to air only to a very limited extent, it is preferred that the second layer is perforated so as to allow air in the inner volume to escape when the sack is filled.

[0014] In a further preferred embodiment, the material of the paper sack according to the present invention comprises a barrier layer which is arranged between the first layer and the second layer, the barrier layer preventing moisture from entering the inner volume. In particular, if the paper sack is used for products which are susceptible to moisture such a configuration is advantageous. Preferably, the barrier layer is formed of Polyethylene (PE) or other materials having a VTR <400g/m²/day.

[0015] In the following an embodiment of a paper sack according to the present invention will be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a schematic view of a paper sack according to the present invention and

Figure 2 shows a cross sectional view of the material of the sack shown in Figure 1.

[0016] As shown in Figure 1 a paper sack 1 according to the present invention that can be used for fine-grained bulk material such as cement, gypsum, granulate, animal feed etc., is formed by a bottom portion 3, an upper portion 5, a front portion 7 and a rear portion (not shown)

wherein in this Figure the bottom and upper portions 3, 5 are folded onto the front portion 7. In the unfolded state, the afore-mentioned portions 3, 5, 7 delimit the inner volume of the sack to be filled with the afore-mentioned variety of products.

[0017] Although the invention is described in connection with a pasted valve sack, it is not limited to such type of sacks. Instead, a material comprising at least one layer of recycled containerboard paper may also be employed in sewn, pasted or folded valve sacks and in pinched or sewn open mouth sacks. However, the invention is neither limited to these types.

[0018] As apparent from Figure 2 showing a cross sectional view of the material 9 from which the portions 3, 5, 7 of the sack are formed, this material comprises a first outer layer 11 which faces away from the inner volume sack 1. This first outer layer 11 is formed of sack kraft paper which preferably has a TEA index of at least 1.3 J/g (MD and CD) and a grammage (weight per unit area) between 60 g/m² and 120g/m². Sack kraft paper is made up from softwood sulfate pulp so that it is composed of long fibers to provide the large tensile strength. In this regard, it is noted that the TEA index is measured according to the method as defined in ISO 1924-3.

[0019] In addition, a second inner layer 13 which faces to the inner volume of the sack, is provided in the material 9, the second inner layer 13 being formed of recycled containerboard paper, in particular Testliner and/or Fluting material. The recycled containerboard paper material of the second inner layer 13 has a grammage between 70 g/m² and 120 g/m². Thus, the material 9 of the sack 1 has an overall stiffness of at least 55 mN.

[0020] Moreover, in the preferred embodiment shown in Figure 2 the material 9 of the sack 1 comprises a barrier layer 15 which is arranged between the first outer and second inner layers 11, 13 and composed of a material preventing moisture from entering the inner volume. Preferably, the barrier layer 15 is formed of Polyethylene (PE).

[0021] Finally, the second inner layer 13 may be perforated so that air contained in the inner volume may escape through the second inner layer 13 during filling of the sack 1.

[0022] Here, it should be noted that in addition to the first and second layers 11, 13 and the barrier layer 15 the material forming the portions 3, 5, 7 of the sack 1 may comprise further layers such as third and fourth layers. Furthermore, although in the above-described preferred embodiment the second layer 13 directly faces the inner volume of the sack 1, it is generally possible and within the scope of the invention that the first layer may directly contact the inner volume. Finally, it is also conceivable that the first and second layers 11, 13 are inside the material and do not have contact with the inner volume.

[0023] In conclusion, the use of recycled containerboard paper for the second layer 13 in combination with a first layer 11 of sack kraft paper for the material 9 of a paper sack 1 results in a more cost-effective and envi-

ronmentally advantageous way of producing such sacks.

Claims

- 5 1. Paper sack, in particular for fine-grained bulk material such as cement, gypsum, granulate, animal feed etc., comprising at least a front portion (7) and a rear portion,
 - 10 wherein said portions (3, 5, 7) delimit an interior volume, wherein the material (9) forming said portions (3, 5, 7) comprises a first layer (11) and a second layer (13),
 - 15 wherein the first layer (11) is formed of sack kraft paper and wherein the second layer (13) is formed of recycled containerboard paper.
- 20 2. Paper sack according to claim 1, wherein said first layer (11) of sack kraft paper has a TEA index of at least 1,3 J/g (MD and CD).
- 25 3. Paper sack according to claim 1 or 2, wherein said first layer (11) of sack kraft paper has a grammage between 60 g/m² and 120 g/m².
- 30 4. Paper sack according to claim 1 to 3, wherein said second layer (13) of recycled containerboard paper has a grammage between 70 g/m² and 120 g/m².
- 35 5. Paper sack according to any of claims 1 to 4, wherein said material (9) has an overall stiffness of at least 55 mN.
- 40 6. Paper sack according to any of claims 1 to 5, wherein said recycled containerboard paper is formed of Testliner and/or Fluting material.
- 45 7. Paper sack according to any of claims 1 to 6, wherein a barrier layer (15) is arranged between said first layer (11) and said second layer (13), the barrier layer (15) preventing moisture from entering the inner volume.
- 50 8. Paper sack according to claim 7, wherein said barrier layer (15) is formed of Polyethylene (PE) or any other material having VTR < 400g/m/day.
- 55 9. Paper sack according to any of claims 1 to 8, wherein said second layer (11) is perforated.

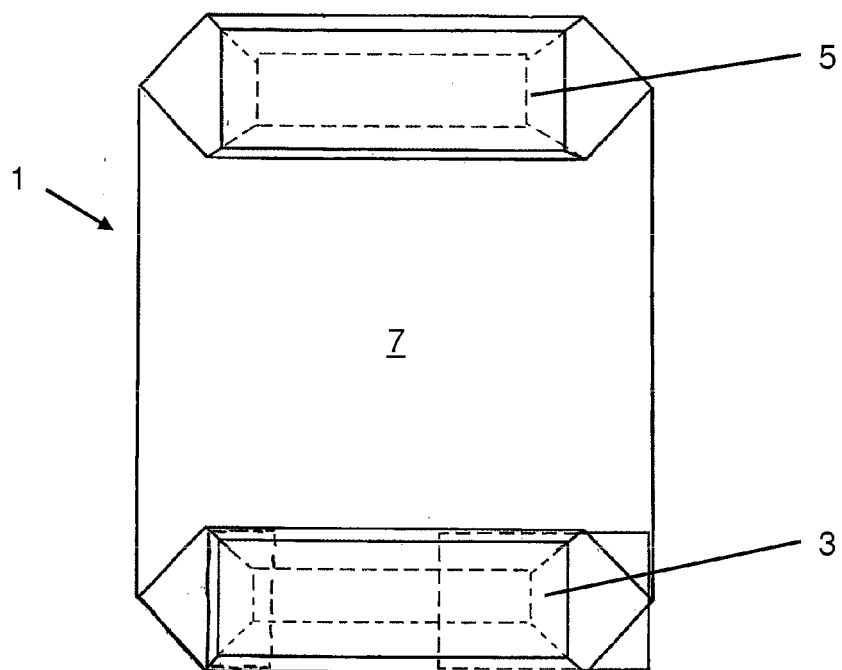


Fig. 1

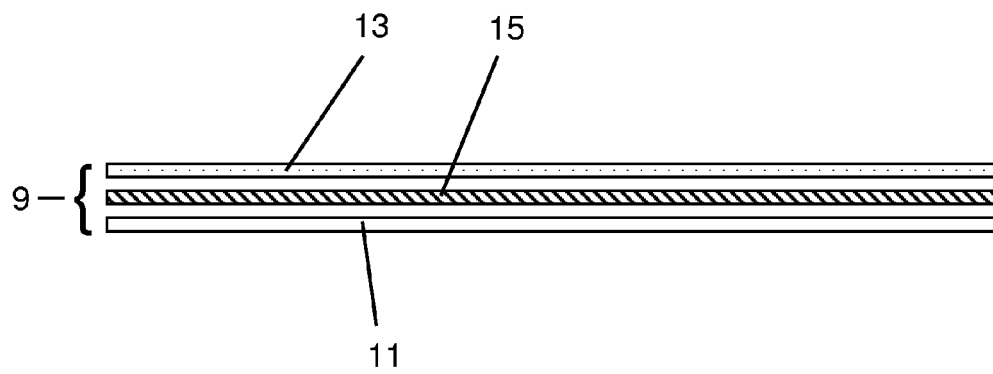


Fig. 2



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Application Number
EP 10 16 3280

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Place of search Munich		Date of completion of the search 30 September 2010	Examiner Jervelund, Niels
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EPO FORM 1503 03.82 (P04C01)

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