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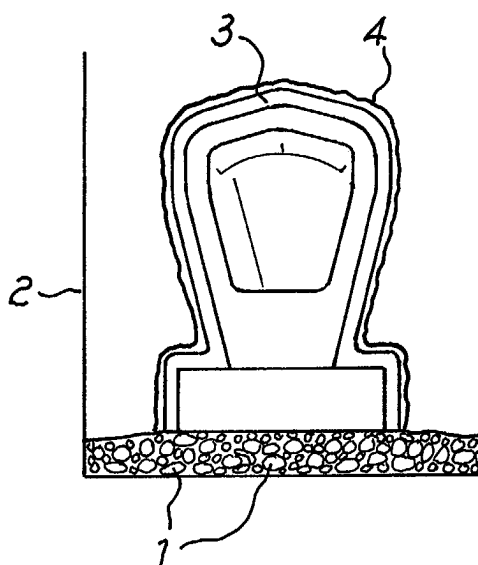
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(54) **Method for the production of packing materials for objects of varying shape and associated packing material**

(57) Method for packing objects of varying shape, comprising the following steps: providing a suitable quantity of small-size base elements (1) made of suitable material; moistening said base elements (1) with a suitable adhesive; providing a suitable container inside

which said adhesive-lined base elements (1) are inserted; polymerizing/drying the adhesive until hardening thereof and consequent relative setting of the base elements (1) is obtained. Packing material obtained using said method.

Fig. 2



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Description

[0001] The present invention relates to a method for the production of packing materials for objects of varying shape and to an associated packing material.

[0002] It is known in the technical sector of packaging that there exists the need to make an object stable after its insertion inside a wrapping or container such as a box or the like, so as to prevent its movement relative to the latter and avoid damage in the event of knocks.

[0003] It is also known that forms made of various material, such as expanded polystyrene or the like, have been designed for this purpose, said forms being capable of assuming an internal shape complementing that of the object and having an external shape equivalent to that of the final packaging box; these known packing materials must be produced, however, on a large scale owing to the cost of the moulds and the need to store said forms.

[0004] As an alternative, packing obtained by casting expanded polyurethane materials able to assume the form of the object to be packed have also been designed: this technique, however, requires sophisticated and very delicate apparatus which need frequent maintenance and use very costly raw materials.

[0005] The technical problem which is posed, therefore, is that of providing a packing material which can easily assume a shape complementing both that of the object to be inserted inside a packaging box/container and that of the container itself, without requiring the manufacture of moulds specially designed for the specific shape of the object to be packed.

[0006] Within the context of this problem it is also required that this packing can be made using low-cost raw materials, is easy and inexpensive to produce and can be applied to objects of varying shape without the need for special adaptation.

[0007] These results are achieved according to the present invention by a method for packing objects of varying shape comprising the following steps: providing a suitable quantity of small-size base elements made of suitable material; moistening said base elements with a suitable adhesive; providing a suitable container inside which said adhesive-lined base elements are inserted; polymerizing/drying the adhesive until hardening thereof and consequent relative setting of the base elements is obtained.

[0008] The present invention also relates to a packing material obtained using said method.

[0009] Further details may be obtained from the following description of a non-limiting example of embodiment of the present invention provided with reference to the accompanying drawings in which:

Figure 1 shows a schematic cross-section along an axial vertical plane, illustrating the first step of the method according to the present invention;
Figure 2 shows a cross-section similar to that of Fig.

1, with the object inserted inside the box;
Figure 3 shows a cross-section similar to that of Fig. 2, with the box being filled; and
Figure 4 shows a cross-section similar to that of Fig. 3, with the box filled and closed.

[0010] The method according to the present invention for packing objects of varying shape envisages the following steps:

- a) providing a suitable quantity of small-size base elements 1 made of suitable material;
- b) providing a suitable container 2 inside which an object 3 of predefined shape to be packed is inserted;
- c) moistening said base elements with a suitable adhesive;
- d) pouring inside the container a first bottom layer of adhesive-lined base elements;
- e) applying to the object 3 to be packed a protective layer 4 made of suitable material;
- f) inserting the object to be packed inside the box 2;
- g) pouring inside the box adhesive-lined base elements until a predefined level or complete filling of the container, as shown in Fig. 4, is reached;
- h) polymerizing/drying the adhesive until hardening thereof and consequent relative setting of the base elements 1 is obtained;
- i) closing the box 2.

[0011] In a further embodiment it is envisaged that the container inside which the base particles 3 are inserted consists of moulds able to impart to the finished packing the desired internal shape - complementing that of the object to be packed - and external shape complementing that of the container inside which the object/packing assembly is inserted.

[0012] This allows the operations of preparation of the packing and actual packaging itself to be suitably separated, permitting however the use of very low cost forms inside which the adhesive-lined base elements are inserted for agglomeration thereof.

[0013] According to preferred embodiments of the method described above it is envisaged that:

- the material which forms the packing elements is in substantially granular form or the like; an example of embodiment of these elements consists, for example, of so-called expanded polystyrene chips;
- the adhesive with which said elements are wetted consists of a one or two component reactive adhesive;
- the adhesive is kept in the fluid state.

[0014] The adhesive may be applied to the base elements for example using machines of the known type suitably designed for this purpose.

[0015] The present invention also relates to a packing

material for objects of varying shape consisting of a set of small-size base elements which are fixed together by means of a suitable adhesive able to set after a certain time interval and allow the base elements to be arranged around the object, assuming a shape complementing that of the said object and/or the external box containing the packed object.

[0016] According to preferred embodiments of the packing material according to the present invention it is envisaged that:

- the material which forms the packing elements is of a substantially granular type; an example of embodiment of these elements consists of so-called expanded polystyrene chips;
- the adhesive with which said elements are wetted consists of a one or two component reactive adhesive;
- the adhesive is kept in the fluid state.

[0017] The present invention also relates to use of small-size elements moistened with adhesive able to set after a predetermined time interval for the production of packing materials for objects of varying shape.

Claims

1. Method for packing objects of varying shape, **characterized in that** it comprises the following steps:

- a) providing a suitable quantity of small-size base elements made of suitable material;
- b) moistening said base elements with a suitable adhesive;
- c) providing a suitable container inside which said adhesive-lined base elements are inserted;
- h) polymerizing/drying the adhesive until hardening thereof and consequent relative setting of the base elements is obtained.

2. Method according to Claim 1, **characterized in that** said container is a mould able to define an internal shape of the packing complementing the shape of the object to be packed.

3. Method according to Claim 1, **characterized in that** said container is a mould able to define an internal shape of the packing complementing the shape of the object to be packed and an external shape complementing that of a final packaging container.

4. Method according to Claim 1, **characterized in that** said container is the box for final packaging of the packed product.

5. Method according to Claim 4, **characterized in that**

it comprises the following further steps following said step b):

- c) applying to the object to be packed a protective layer made of suitable material;
- d) pouring inside the box a first bottom layer of adhesive-lined base elements;
- e) inserting the object to be packed inside the box;
- f) pouring inside the box adhesive-lined base elements until a predefined level is reached;
- g) closing the box.

6. Method according to Claim 1, **characterized in that** the material which forms the packing elements is of the granular type.

7. Method according to Claim 1, **characterized in that** said base elements consist of expanded polystyrene chips.

8. Method according to Claim 1, **characterized in that** said adhesive is of the one component reactive type.

9. Method according to Claim 1, **characterized in that** said adhesive is of the two component reactive type.

10. Method according to Claim 1, **characterized in that** said adhesive is kept in the fluid state.

11. Packing material for objects (3) of varying shape, **characterized in that** it consists of a set of small-size base elements (1) which are fixed together by means of a suitable adhesive able to set after a certain time interval and allow the base elements to be arranged around the object, assuming a shape complementing that of the object.

12. Packing material according to Claim 11, **characterized in that** said packing material has an internal shape complementing that of the object to be packed and an external shape complementing that of the box for final packaging of the packed object.

13. Packing material according to Claim 11, **characterized in that** the material which forms the base elements of the packing is of the granular type.

14. Packing material according to Claim 11, **characterized in that** the material which forms the base elements consists of expanded polystyrene chips.

15. Packing material according to Claim 11, **characterized in that** said adhesive is of the one component reactive type.

16. Packing material according to Claim 11, **characterized in that** said adhesive is of the two component reactive type.

17. Packing material according to Claim 11, **characterized in that** said adhesive is in the fluid state. 5

18. Use of small-size elements moistened with adhesive able to set after a predetermined time interval for the production of packing materials for objects of varying shape. 10

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Fig. 1

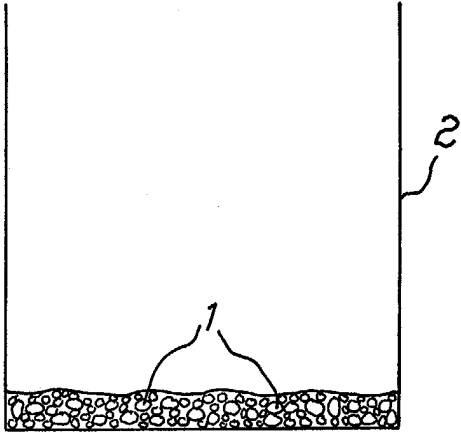


Fig. 2

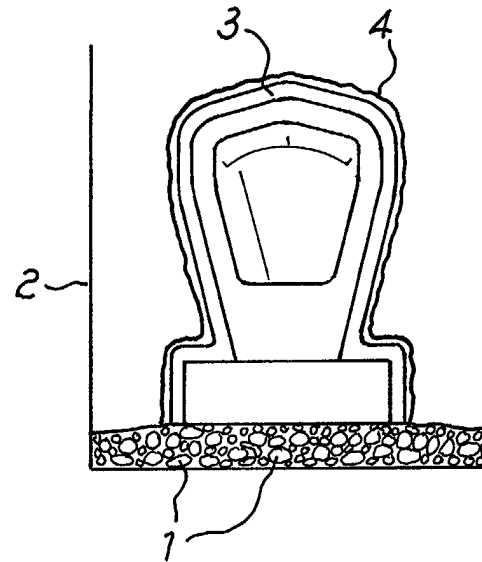


Fig. 3

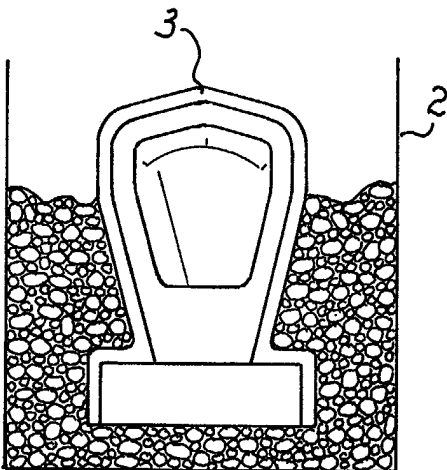


Fig. 4

