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(54) **CLOSING DEVICE**

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(57) **ABSTRACT**

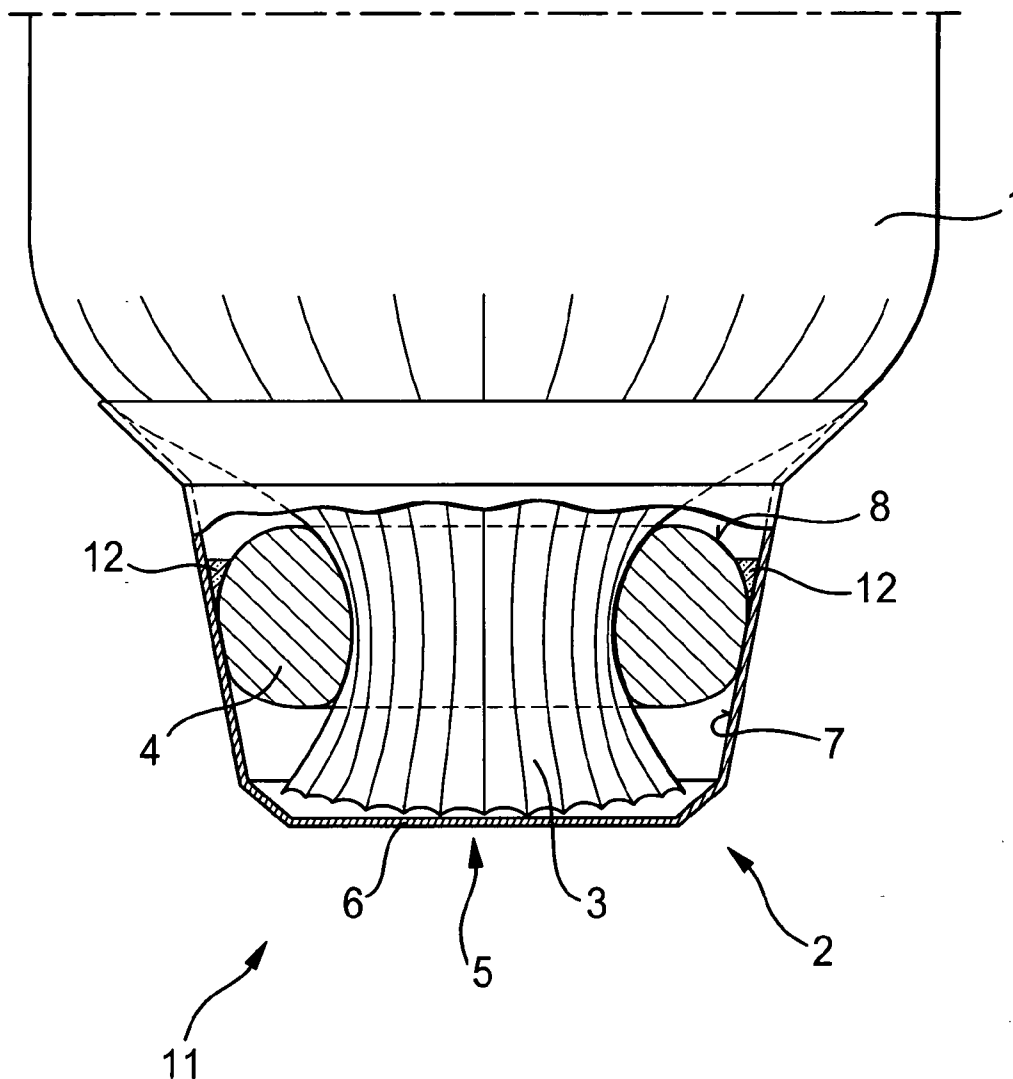
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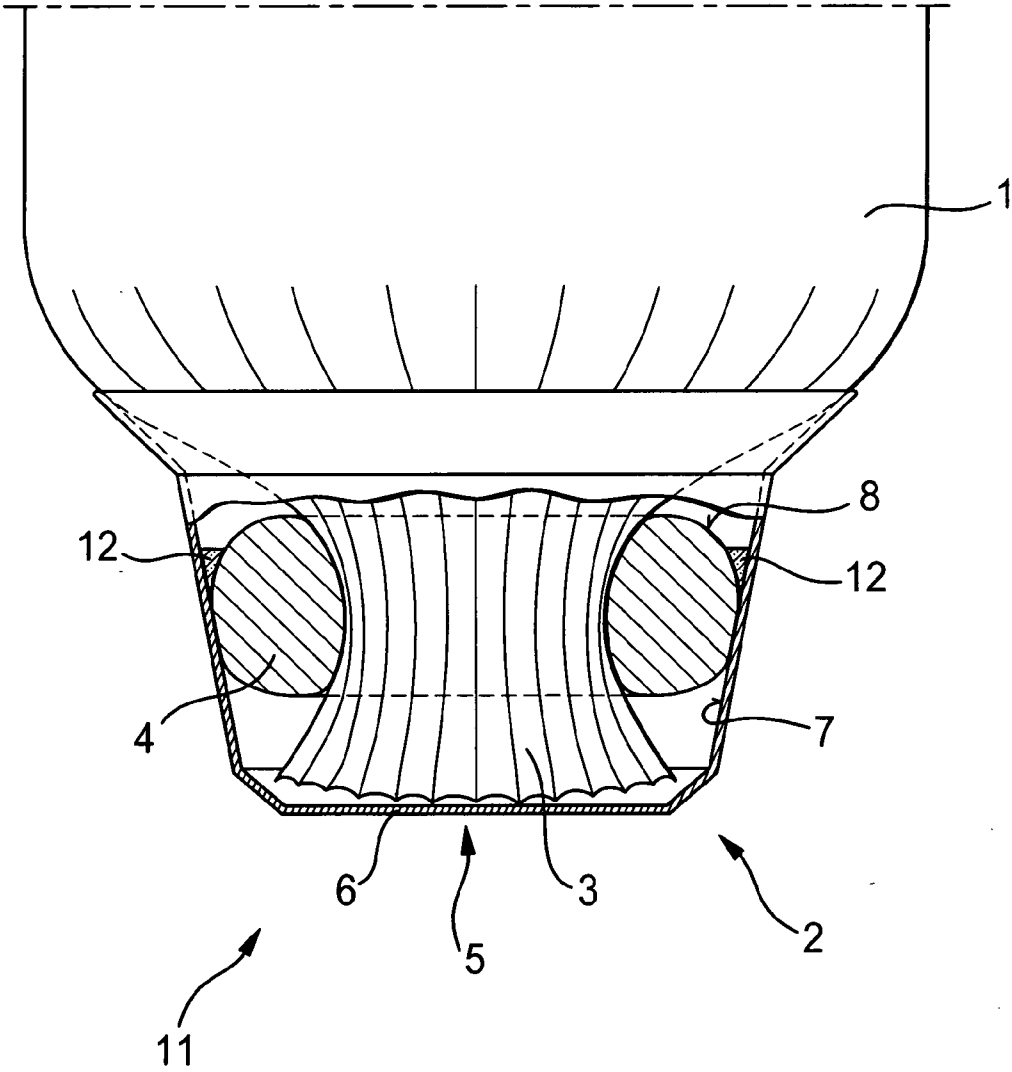
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A device (11) for closing an end-side closing section (2) of a packaging-forming, flexible or pouch bag formed of a film material includes a clamp (4) surrounding the pigtail end (3) of the end-side closing section for closing the same and a cap (6) surrounding free end (5) of the pigtail end (3) and secured on the clamp (4) with an adhesive (12) for forming a force-locking connection between the cap (6) and the clamp (4).





CLOSING DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a device for closing an end-side closing section of a packaging-forming flexible or pouch bag formed of a film material, with the closing device having a clamp surrounding a pigtail end for closing the end-side closing section and a cap surrounding a free end of the pigtail end.

[0003] 2. Description of the Prior Art

[0004] Chemical materials such as, e.g., sealing and adhesive materials are stored, nowadays, in flexible or pouch bags formed of a film material. For closing the end side closing section of a bag, the film material is gathered in a pigtail at the end of the closing section, and the pigtail end of the closing section is closed with a clamp that surrounds the pigtail end. One-or-two-component masses such as polyurethane systems, silicone masses, injectionable connecting mortar, can be examples of such material. Dependent on the filler material and the physical behavior of the fluid components of the material that fills the bag, leakage can occur at the pigtail end of the bag. The leakage is produced by separation of the fluid components from the filler material. The fluid component leaks through folds formed by the bag in the clamp region, with the leakage effect being reinforced by a capillary effect. The leakage is further reinforced when a coarse filler mass is stored in the bag. Dependent on a mass that fills the bag, the mass leaving the bag can contaminate the environment. Furthermore, the shelf life of the filler mass can be reduced.

[0005] German utility model DE 298 09 514 U1 discloses a flexible or pouch bag made of a film material, with a sealing tape provided in the region of the pigtail. The drawback of this solution consists in that the adhesion of tape to the surface of the film material cannot always be insured.

[0006] U.S. Pat. No. 3,308,936 discloses closing the end-side closing end of a bag with a cap that surrounds the clamp. For forming a form-locking connection between the cap and the clamp, the cap is selectively pressed into the cap with a suitable tool. The drawback of this solution consists in that the film material of the flexible or pouch bag can be damaged during the cap being pressed in.

[0007] German Publication DE 40 19 937 A1 discloses a closing device provided on the end-side closing section of a sausage sleeve or a similar film packaging for sausage meat or packagings for materials having a similar consistency. The device includes a cap that surrounds the pigtail end that is closed with a clamp. For forming a formlocking connection with a locking nose provided on the clamp, the cap engages the clamp from behind or in a groove. The drawback of this solution consists in that for forming a sufficiently reliable connection with the clamp, the cap should be precisely adapted to the shape of the pigtail end and the arrangement of the clamp thereon. In addition, as in the U.S. Pat. No. 3,308,936, the film material of the packaging can be damaged when the cap is mounted on the pigtail end.

[0008] Accordingly, an object of the present invention is to provide a closing device for closing the end-side closing

section of a flexible or pouch bag formed of a film material and which can be easily mounted on the pigtail end of the end-side closing section and insures a flexible securing of the cap.

SUMMARY OF THE INVENTION

[0009] This and other objects of the present invention, which will become apparent hereinafter, are achieved by securing the cap to the clamp with an adhesive. The adhesive can be provided in the interior of the cap so that it fills the space between the cap and the clamp when the cap is put on the clamp. Thereby, due to the adhesive bonding of the surfaces of the cap and the clamp, on one hand, and due to the stability of the adhesive (cohesion), on the other hand, the cap and the clamp become force- and formlocking connected with each other. Alternatively, the adhesive can be provided on the clamp so that the adhesive in this case likewise, fills the space between the cap and the clamp when the cap is put on the clamp. Whenever a packaged material leaks from the pigtail end which is surrounded by the clamp, the material is received in the cap so that its leakage from the packaging bag is prevented.

[0010] Instead of simply placing the cap on the clamp, the cap, e.g., can be placed on the clamp over the pigtail end by rotating the cap. For a reliable fixing of the cap on the clamp, it is sufficient to apply the adhesive selectively in a number of point to the clamp or the cap. The adhesive connection proved to be satisfactory at both static load and dynamic load. With the use of the adhesive the surfaces and the structure of the material of the cap or the clamp does not change. Furthermore, with the connection being effected along the corresponding surfaces and due to the elasticity of the adhesive, the oscillation damping characteristics of the adhesive connection is improved in comparison, e.g., with pressure connection of the clamp and the cap. By selecting a suitable adhesive, a cap which is made, e.g., of a plastic material can be connected with a clamp made, e.g., of metal. The connection arrangement according to the present invention insures a satisfactory connection of the cap with the clamp during transportation and storage up to the use of the material in the flexible or pouch bag. The closing device is easily mountable and is flexible in use.

[0011] Suitable adhesives are, e.g., physically bonded adhesives, such as adhesives containing loose materials, dispersion adhesives, contact adhesives, and plastisole. Further suitable adhesive are chemically hardened or anaerobically hardened adhesives available as one-or multi-component systems, such as, e.g., a polyurethane adhesive.

[0012] Advantageously, a cyanacrylate adhesive is used and which is better known as "seconds glue." This adhesive becomes transformed into a real adhesive polymer as a result of polymerization reaction in the joint clearance.

[0013] The polymerization runs very rapidly so that within seconds a firm connection between the cap and the clamp is produced. In addition, the cyanacrylate adhesive is suitable for an automatic application.

[0014] Advantageously, the adhesive is circumferentially distributed over the cap and/or the clamp, so that in addition to a reliable connection between the cap and the clamp, a sealed connection therebetween is provided. The adhesive layer serves as a sealing layer for gases and fluids which can

be formed or produced and, on the other hand, prevents penetration of the waste water and corrosion associated with the penetration of water.

[0015] The novel features of the present invention, which are considered as characteristic for the invention, are set forth in the appended claims. The invention itself, however, both as to its construction and its mode of operation, together with additional advantages and objects thereof, will be best understood from the following detailed description of a preferred embodiment, when read with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] In the Drawings show:

[0017] Single FIGURE shows a partially cross-sectional view of a closing section of a packaging-forming, flexible or pouch bag.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] The closing device 11 according to the present invention is arranged at an end-of a closing section 2 of a flexible or pouch bag 1 that is shown only partially and forms a packaging for a filler material. The bag 1 is formed of a film material. The end-side closing section 2 extends up to a pigtail end 3 that is closed by a clamp 4 which surrounds the pigtail end 3. The free end 5 of the pigtail end 3 is surrounded by a cap 6 that is secured on the clamp 4 with an adhesive 12. The adhesive 12 is a cyanacrylate glue.

[0019] The adhesive 12 is selectively applied, at several points, to the inner surface 7 of the cap 6, and then the cap 6 is pressed over the clamp 4 by being rotated about the pigtail end 3.

[0020] According to an alternative embodiment, the adhesive 12 is applied over the circumference of the outer surface 8 of the clamp 4, and the cap 6 is pressed over the clamp 4 by being rotated about the pigtail end.

[0021] Though the present invention was shown and described with references to the preferred embodiment, such is merely illustrative of the present invention and is not to be construed as a limitation thereof and various modifications of the present invention will be apparent to those skilled in the art. It is therefore not intended that the present invention be limited to the disclosed embodiment or details thereof, and the present invention includes all variations and/or alternative embodiments within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

- 1. A device (11) for closing an end-side closing section (2) of a packaging-forming, flexible or pouch bag formed of a film material and having a pigtail-end (3), the closing device comprising a clamp (4) surrounding the pigtail end (3) for closing the end-side closing section; a cap (6) surrounding free end (5) of the pigtail end (3); and adhesive means (12) for forming a force-locking connection between the cap (6) and the clamp (4).
- 2. A closing device according to claim 1, wherein the adhesive means (12) comprise a cyanacrylate glue.
- 3. A closing device according to claim 1, wherein the adhesive means (12) is provided on at least one of inner circumference of the cap (6) and outer circumference of the clamp (4).

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