A cartridge with at least one material receptacle chamber, an axially displaceable piston arranged in the material receptacle chamber and a piston restraint for preventing the at least one piston from being pressed out of the pertinent material receptacle chamber. The piston restraint consists of an elastic restraining disk that is realized in the form of a disk spring and positively and/or non-positively held on the inner wall of the at least one material receptacle chamber.
CARTRIDGE WITH PISTON RESTRAINT

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention pertains to a cartridge with a piston restraint.


[0004] Joint scaling seals, adhesives, pastes and the like are frequently stored in cartridges with one or more material receptacle chamber(s) that is/are provided with an outlet opening and a corresponding delivery piston for dispensing the cartridge contents. Cartridges of this type are usually sealed in an air-tight fashion on both sides before they are used. On the lower end, the cartridges are sealed by the axially displaceable delivery piston, with the upper end being sealed by a removable plug or a screw cap. Many cartridges contain materials that tend to gasify at elevated temperatures. This causes an internal pressure to be built up in the material receptacle chambers, with this internal pressure possibly causing the delivery piston to be pressed out of the material receptacle chamber during the storage or the transport of the cartridges.

[0005] In order to prevent an undesired pressing out of the delivery piston, it is common practice to utilize plastic rings that are either attached onto the end of the cartridges by means of a snap-on mechanism or fixed on the cartridges by means of friction welding. However, these solutions are complicated and expensive with respect to the manufacturing technology. The friction welding method, in particular, is time-consuming and associated with relatively high costs. In addition, known snap-on mechanisms cannot be used on all cartridges. Especially with coaxial cartridges that are manufactured in the form of an integral injection molding part and in which, for example, a first component that tends to gasify is accommodated in an inner tube arranged within an outer tube that accommodates the second component, the manufacturing technology does not make it possible to produce the required hook-shaped undercut on the inner tube for snapping on a plastic ring.

SUMMARY OF THE INVENTION

[0006] The invention is based on the objective of developing a cartridge of the initially described type which contains an inexpensive piston restraint that can be rapidly installed and prevents the piston from being pressed out of the cartridge.

[0007] This objective is attained with a cartridge that is realized in accordance with the provision of a cartridge with at least one material receptacle chamber, an axially displaceable piston arranged in the material receptacle chamber and a piston restraint for preventing the at least one piston from being pressed out of the pertinent material receptacle chamber, characterized by the fact that the piston restraint consists of a springable restraining disk that is realized similar to a disk spring and positively and/or non-positively held on the inner wall of the at least one material receptacle chamber. The cartridge can be characterized by the fact that the restraining disk has an annular shape, that the restraining disk consists of metal, that the restraining disk consists of spring steel, that the restraining disk has a thickness of a few tenths of a millimeter, and/or that the restraining disk is curved or inclined in the direction of the piston. The restraining disk can be inserted into the material receptacle chamber by the means of a ram.

[0008] As noted above, the invention pertains to a cartridge with at least one material receptacle chamber, an axially displaceable piston arranged in the material receptacle chamber and a piston restraint for preventing the at least one piston from being pressed out of the pertinent material receptacle chamber. The piston restraint consists of an elastic restraining disk that is realized in the form of a disk spring and positively and/or non-positively held on the inner wall of the at least one material receptacle chamber.

[0009] One significant advantage of the cartridge according to the invention can be seen in the fact that the piston is secured by the clamping or wedging effect of a restraining element such that no additional welding, bonding or snap-on mechanisms are required. This significantly simplifies the manufacture of cartridges provided with restraining devices of this type. The time and the costs for manufacturing the restraining element can also be reduced. Instead of utilizing a costly injection molding tool for manufacturing a plastic ring, the restraining element of the restraint according to the invention can be manufactured in a comparatively inexpensive fashion with a cutting tool.

[0010] Another advantage of the invention is the simplified installation. The restraining element can be inserted into the cartridge in a relatively simple and rapid fashion, namely because no complicated connecting processes are required.

[0011] In one particularly practical embodiment of the invention, the restraining element consists of a ring disk of spring steel which adjoins the inner wall of a corresponding receptacle chamber with a certain prestress similar to a disk spring. The ring disk may, for example, be inserted into the rear end of the central receptacle tube of a coaxial cartridge. If so required, such a restraining disk could also be used for correspondingly securing the annular piston arranged around a central receptacle tube. The piston can also be secured in this fashion in other single-component or multi-component cartridges.

[0012] The ring disk is preferably installed in such a way that it is curved or angled in the direction of the piston. If the piston presses against the ring disk in this case, the radial force on the outer side of the ring disk increases such that the ring disk is additionally wedged on the inner wall of the material receptacle chamber.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Other details and advantages of the invention are discussed below in the description of one preferred embodiment with reference to the figures. Shown are:

[0014] FIG. 1, the rear end of a cartridge with a piston and a restraining ring in the storage state;

[0015] FIG. 2, the rear end of a cartridge with a piston and a restraining ring in the functional state, and

[0016] FIG. 3, a partially illustrated ram for installing the restraining ring shown in FIGS. 1 and 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0017] FIGS. 1 and 2 show the rear end of a cartridge that usually contains a not-shown outlet opening on the
upper end. The plastic cartridge 1 contains a cylindrical material receptacle chamber 2, in which a piston 3 in the form of a delivery piston is arranged such that it can be axially displaced. An elastic restraining ring 5 of metal that adjoins the inner wall 6 of the material receptacle chamber 2 with a prestress is inserted into the rear cartridge end 4.

Although the invention has been shown and described with reference to a preferred embodiment, changes are possible and will be apparent to those skilled in the art from the teachings herein. Such changes are deemed to fall within the purview of the invention as claimed.

1. Cartridge with at least one material receptacle chamber, an axially displaceable piston arranged in the material receptacle chamber and a piston restraint for preventing the at least one piston from being pressed out of the pertinent material receptacle chamber, characterized by the fact that the piston restraint consists of a springable restraining disk that is realized similar to a disk spring and positively and/or non-positively held on the inner wall of the at least one material receptacle chamber.

2. Cartridge according to claim 1, characterized by the fact that the restraining disk has an annular shape.

3. Cartridge according to claim 1, characterized by the fact that the restraining disk consists of metal.

4. Cartridge according to claim 1, characterized by the fact that the restraining disk consists of spring steel.

5. Cartridge according to claim 1, characterized by the fact that the restraining disk has a thickness of a few tenths of a millimeter.

6. Cartridge according to claim 1, characterized by the fact that the restraining disk is curved or inclined in the direction of the piston.

7. Cartridge according to claim 1, characterized by the fact that the restraining disk can be inserted into the material receptacle chamber by the means of a ram.

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