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(54) **VOLUMETRIC DOSING PUMP AND DOSING SYSTEM COMPRISING AT LEAST ONE OF SUCH PUMPS**

VOLUMETRISCHE DOSIERPUMPE UND DOSIERSYSTEM MIT MINDESTENS EINER SOLCHEN PUMPE

POMPE DE DOSAGE VOLUMÉTRIQUE ET SYSTÈME DE DOSAGE COMPRENANT AU MOINS UNE DE CES POMPES

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Description

[0001] The present invention refers to a volumetric dosing pump for powdery, liquid, pasty or creamy products, and to a dosing system comprising at least one of such pumps.

[0002] In particular, the invention refers to a pump with progressive recesses for dosing and delivering powdery products or product having high viscosity, such as, for example, glues, mastexes, grease, paints, etc., and to a dosing system comprising at least one of such pumps.

[0003] Pumps with progressive recesses used in dosing systems are known and have several advantages: they guarantee a perfect seal when the internal rotor does not move with respect to the external stator, a high reliability with neglectable wear between the internal rotor and the external stator, allow a continuous and extremely accurate delivery of the product, avoiding possible drippings at the outlet duct level.

[0004] The stators of these known pumps with progressive recesses are made of rubber, preferably vulcanized and compression molded.

[0005] These pumps with progressive recesses, however, are not satisfactory and have the problem that, due to their chemical nature, the rubbers of which their stators are made have a limited compatibility range with the delivered products, also when there are more aggressive solvents.

[0006] In order to solve this problem, it is necessary to manufacture stators by using materials whose cost is higher and higher with the increase of the aggression of solvents present in the delivered product, till excessive cost levels are reached which are not aligned with the reference market.

[0007] Documents US-A1-2010/038142, WO-A2-2012/024215 and WO-A1-2004/036043 disclose strengthened stators for severe applications according to the prior art.

[0008] Object of the present invention is solving the above prior art problems by providing a volumetric dosing pump with progressive recesses and a dosing system comprising at least one of such pumps, which allow their use to deliver products containing aggressive solvents, keeping at the same time a reduced pump cost.

[0009] The above and other objects and advantages of the invention, as will result from the following description, are obtained with a volumetric dosing pump and with a dosing system comprising at least one of such pumps as claimed in the independent claims. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0010] It is intended that all enclosed claims are an integral part of the present description.

[0011] It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as appears

from the enclosed claims.

[0012] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 shows a side sectional view of a volumetric dosing pump according to the present invention; and
- Figure 2 shows a side sectional view of a part of a volumetric dosing pump according to the present invention.

[0013] With reference to the Figures, the volumetric dosing pump 10 according to the present invention, in particular for delivering and dosing powdery, liquid, pasty or creamy products, comprises a first duct 5 for entering the product to be dosed, a second duct 9 for exiting such dosed product, an internal recess 12 connected to the first duct 5 for entering the product to be dosed and at least one pumping element with progressive recesses 7, which doses such product, operatively connected to motor means, composed for example of an electric driving motor (not shown in the Figures), and fluid connected to the internal recess 12 and to the second duct 9 for exiting such dosed product.

[0014] The pumping element with progressive recesses 7 comprises an external stator case 14 and an internal rotor 15 driven in rotation by the motor means, such internal rotor 15 being shaped as a worm screw with progressive recesses whose relative rotation with respect to the stator 14 causes a translation movement of the product therein. When the pump 10 with progressive recesses is actuated by the motor means, during the rotation movement of its internal rotor 15, it transfers certain amounts of product from the first duct 5 for sucking such product to be dosed to the second exit duct 9.

[0015] The stator further comprises an internal surface 16 in contact with the rotor 15 which, similarly thereto, is shaped as a worm screw or a coil, said internal surface 16 being coated with a coating layer 18 made of a different material with respect to the material of which the stator 14 is made.

[0016] The stator 14 is made of rubber, for example thermoplastic rubber, through moulding, and the coating layer 18 is made of polyethylene.

[0017] The stator 14 and the coating layer 18 are made through injection co-moulding of the stator 14 and of the coating layer 18; preferably, the stator 14 and the coating layer 18 are made through co-moulding of rubber and of a layer of polyethylene.

[0018] Advantageously, the coating layer 18 made of polyethylene, allows using the pump with materials containing the most used solvents, without damaging the surface of the stator 14 and with a reduced cost.

[0019] A dosing/delivering system according to the present invention comprises at least one managing and actuating device, such managing and actuating device comprising motor means, and at least one dosing pump

10 as previously described, operatively connected to such motor means, for example by interposing at least one related rotating shaft.

[0020] Advantageously, the system according to the present invention can further comprise means for supplying and/or storing the product to be dosed and delivered by the dosing pump 10, fluid connected to the first suction duct 5.

Claims

1. Volumetric dosing pump (10) for delivering and dosing powdery, liquid, pasty or creamy products, namely glues, mastexes, grease, paints, said dosing pump (10) comprising a first duct (5) for entering the product to be dosed, a second duct (9) for exiting such dosed product, an internal recess (12) connected to the first duct (5) for entering the product to be dosed and at least one pumping element with progressive recesses (7), which doses such product, operatively connected to motor means and fluid connected to the internal recess (12) and to the second duct (9) for exiting such dosed product, said pumping element with progressive recesses (7) comprising an external stator case (14) and an internal rotor (15) driven in rotation by the motor means, said internal rotor (15) being shaped as a worm screw with progressive recesses and said stator comprising an internal surface (16) in contact with the rotor (15) and being shaped as worm screw, said internal surface (16) being coated with a coating layer (18) made of a different material with respect to the material of which the stator (14) is made, **characterized in that** the stator (14) and the coating layer (18) are made through injection co-moulding of the stator (14) and of the coating layer (18), the stator (14) being made of rubber, the coating layer (18) being made of polyethylene.
2. Volumetric dosing pump (10) according to claim 1, **characterized in that** the stator (14) is made of thermoplastic rubber.
3. Dosing/delivering system comprising at least one managing and actuating device, such managing and actuating device comprising motor means and at least one volumetric dosing pump (10) according to any one of the previous claims, operatively connected to such motor means.

Patentansprüche

1. Volumetrische Dosierpumpe (10) zum Ausbringen und Dosieren von pulverförmigen, flüssigen, pastösen oder cremigen Produkten, d. h. Leimen, Kitten, Fetten, Farben, wobei die Dosierpumpe (10) einen

ersten Einlasskanal (5) für das zu dosierende Produkt umfasst, einen zweiten Auslasskanal (9) für das dosierte Produkt, einen inneren Hohlraum (12), der mit dem ersten Einlasskanal (5) des zu dosierenden Produkts verbunden ist, und mindestens ein Pumpenelement mit progressiven Hohlräumen (7), das dieses dosierte Produkt, betrieblich mit Motormitteln verbunden und strömungsmäßig mit dem inneren Hohlraum (12) und dem zweiten Auslasskanal (9) dieses dosierten Produkts verbunden, wobei das Pumpenelement (7) mit progressiven Hohlräumen ein äußeres Statorgehäuse (14) und eine umfasst Innenrotor (15), dessen Drehung durch die Motormittel gesteuert wird, wobei der Innenrotor (15) wie eine Schnecke mit progressiven Hohlräumen geformt ist und der Stator eine Innenfläche (16) aufweist, die mit dem Rotor (15) in Kontakt steht und die Form hat einer Schneckenschraube, wobei die Innenfläche (16) mit einer Überzugsschicht (18) aus einem anderen Material als dem Material, aus dem der Stator (14) besteht, bedeckt ist, **dadurch gekennzeichnet, dass** der Stator (14) und die Die Abdeckschicht (18) wird durch gemeinsames Spritzgießen des Stators (14) und der Abdeckschicht (18) hergestellt, wobei der Stator (14) aus Gummi und die Abdeckschicht (18) aus Polyethylen besteht.

2. Volumetrische Dosierpumpe (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Stator (14) aus thermoplastischem Gummi besteht.
3. Dosier-/Abgabesystem mit mindestens einer Verwaltungs- und Antriebsvorrichtung, wobei die Verwaltungs- und Antriebsvorrichtung Motormittel und mindestens eine volumetrische Dosierpumpe (10) nach einem der vorherigen Ansprüche umfasst, die betriebsmäßig mit den Motormitteln verbunden ist.

Revendications

1. Pompe doseuse volumétrique (10) pour la distribution et le dosage de produits pulvérulents, liquides, pâteux ou crémeux, à savoir colles, mastics, graisses, peintures, ladite pompe doseuse (10) comprenant un premier conduit d'entrée (5) du produit à doser, un deuxième conduit de sortie (9) du produit dosé, une cavité interne (12) reliée au premier conduit d'entrée (5) du produit à doser et au moins un élément de pompage à cavités progressives (7), doseur de ce produit, relié fonctionnellement à des moyens moteurs et relié fluidiquement à la cavité interne (12) et au deuxième conduit de sortie (9) de ce produit dosé, ledit élément de pompage (7) à cavités progressives comprenant un carter externe de stator (14) et un rotor interne (15) commandé en rotation par les moyens moteurs, ledit rotor interne (15) étant conformé comme une vis sans fin à cavités

progressives et ledit stator comprenant une surface interne (16) en contact avec le rotor (15) et ayant la forme de vis sans fin, ladite surface interne (16) étant recouverte d'une couche de revêtement (18) réalisée dans un matériau différent de celui avec lequel le stator (14) est réalisé, **caractérisé par le fait que** le stator (14) et la couche de revêtement (18) sont réalisées par moulage par co-injection du stator (14) et de la couche de revêtement (18), le stator (14) étant en caoutchouc, la couche de revêtement (18) étant en polyéthylène.

2. Pompe doseuse volumétrique (10) selon la revendication 1, **caractérisée en ce que** le stator (14) est en caoutchouc thermoplastique.
3. Système de dosage/distribution comprenant au moins un dispositif de gestion et d'entraînement, ledit dispositif de gestion et d'entraînement comprenant des moyens moteurs et au moins une pompe doseuse volumétrique (10) selon l'une quelconque des revendications précédentes, reliée fonctionnellement auxdits moyens moteurs.

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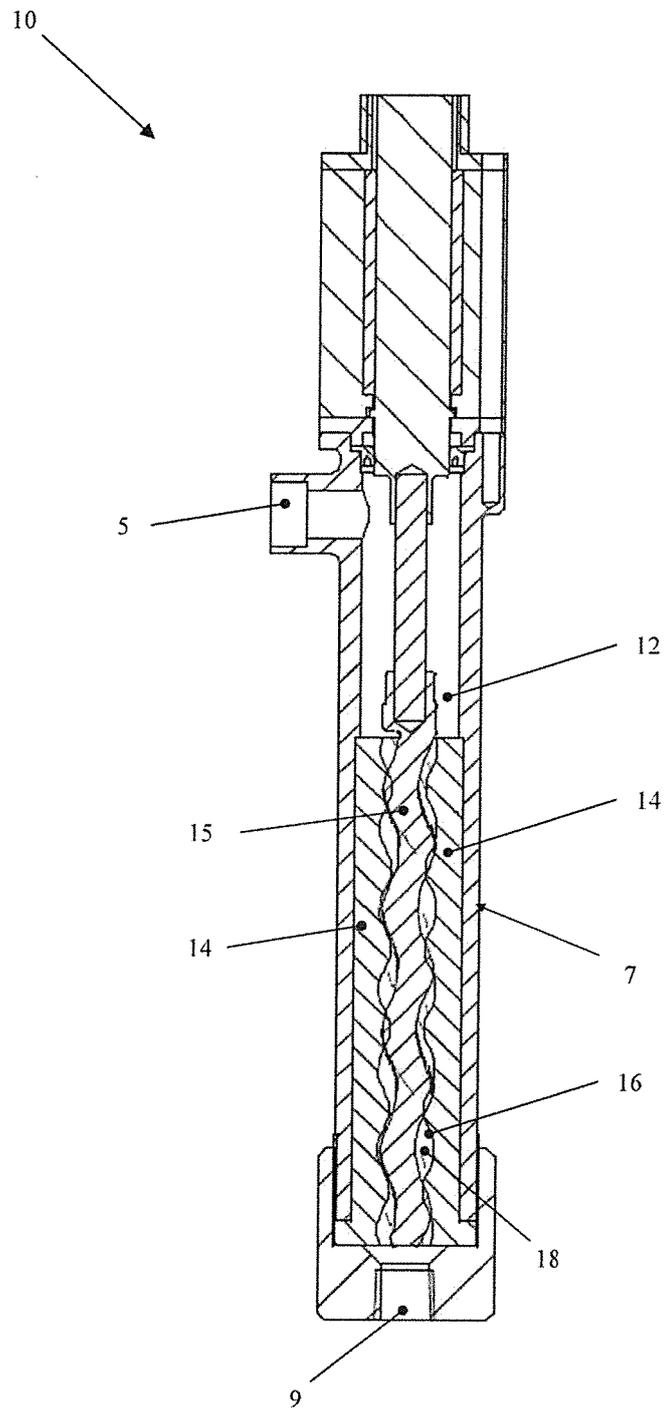


FIG. 1

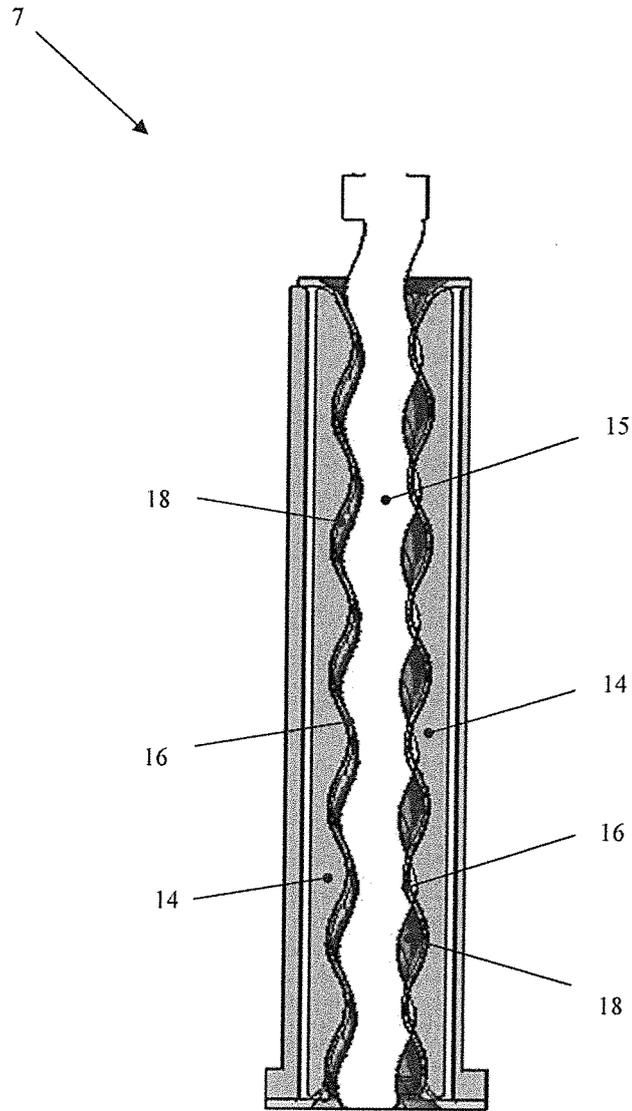


FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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