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(54) ADAPTOR DEVICE FOR COUPLING A NOZZLE TO A CONTAINER

ADAPTERVORRICHTUNG ZUR VERBINDUNG EINER DÜSE MIT EINEM BEHÄLTER

DISPOSITIF ADAPTATEUR POUR RACCORDER UNE BUSE À UN RÉCIPIENT

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Description

[0001] The present invention relates to an adaptor device for coupling a suction nozzle to a container, preferably containing chemical products, according to the preamble of claim 1, that allows, in a simple, reliable, efficient and inexpensive, to stably keep the nozzle in a fixed position with respect to the container mouth, being reliably applicable to many different kinds of containers.

[0002] The adaptor device according to the invention will be disclosed with reference, only by way of example and not by way of limitation, to an application thereof to containers containing chemical products. However, it should be considered that the device according to the invention may be applied to containers or tanks containing any kind of product, e.g. a liquid, powdered, gel, or gaseous one, having a mouth into which it is necessary to insert in a stable position a nozzle or a hose, still remaining within the scope of the present invention.

[0003] It is known that the use of chemical products is presently extremely diffused in many fields. By way of example and not by way of limitation, (liquid, powdered, gel, or gaseous) chemical products, usually contained in containers, are used in agriculture for protecting cultivations from weeds (pesticides) and insects (insecticides), in washing equipments wherein water is mixed with chemical products such as for instance wet or dry foam, and in industrial manufacturing processes comprising chemical processing steps.

[0004] In particular, chemical products are taken out from respective containing containers by inserting a suction nozzle into the relevant filling/emptying mouth, provided with a screw thread onto which a closing cap is screwed. During the suction operation, the nozzle must remain in a stable position with respect to the container mouth, and to this end a system for coupling the nozzle to the container and the mouth thereof.

[0005] However, containers for containing chemical products are not standardised as to the filling mouths. In this regard, on the contrary it should be noted that chemical product manufacturers customise containers, related closing caps just in order to make them incompatible with other containers, thus creating closed markets ("captive markets") wherein customers are compelled to continue to supply themselves from the same supplier.

[0006] As a consequence, even the systems for coupling nozzles, which must ensure that during the suction operation the nozzles are kept in position and do not float, must be similarly adapted to a single type of containers.

[0007] Some coupling systems have been developed for being usable with a plurality of types of containers. Document WO 2005/118422 describes an adaptor device according to the preamble of claim 1.

[0008] However, such systems suffer from the drawback that they do not ensure fastening of the suction nozzle to the container.

[0009] Hence, it is an object of the present invention to allow a simple, reliable, efficient and stable coupling

of a suction nozzle to different kinds of containers containing chemical products.

[0010] Therefore, it is specific subject matter of this invention an adaptor device for coupling a suction nozzle to a container, preferably containing chemical products, comprising:

- an at least partially elastic disc, provided with a through hole,
- one or more tongues coupled to the disc and projecting from one surface of the disc,

the disc being capable to transmit a pressure exerted onto a perimeter of the through hole so that a free end of each one of said one or more tongues bends towards a central portion of the disc.

[0011] Always according to the invention, the disc may be made of plastic material, preferably PVC.

[0012] Still according to the invention, the through hole of the disc may be not axial.

[0013] Furthermore according to the invention, the through hole of the disc may be delimited by an annulus subdivided into a plurality of sectors, preferably equal to each other, more preferably equal to four.

[0014] Always according to the invention, at least one part of said one or more tongues may be aligned with one or more respective radii of the through hole passing through respective ends of one or more sectors of the annulus.

[0015] Still according to the invention, said one or more tongues may be integrally coupled to the disc.

[0016] Furthermore according to the invention, said one or more tongues may be housed in corresponding housing seats placed on a surface of the disc.

[0017] Always according to the invention, the adaptor device may further comprise a cover provided with a through hole.

[0018] Still according to the invention, the cover may comprise at least one pin capable to insert into a corresponding notch of the disc, so that the through hole of the disc and the through hole of the cover are aligned.

[0019] The present invention will be now described, by way of illustration and not by way of limitation, according to its preferred embodiments, by particularly referring to the Figures of the enclosed drawings, in which:

Figure 1 shows a first perspective view of the preferred embodiment of the adaptor device according to the invention in a first disassembled configuration, along with a nozzle;

Figure 2 shows a second perspective view of the adaptor device of Figure 1, in a second partially assembled configuration;

Figure 3 shows a bottom plan view of a portion of the adaptor device of Figure 1; and

Figures 4a, 4b, and 4c respectively show a perspective view, a front view and a side view, of the adaptor device of Figure 1 applied to a container, wherein

the portion of the nozzle inserted into the latter is shown as well.

[0020] In the Figures, alike elements are indicated by same reference numbers.

[0021] The inventor has developed the adaptor device according to the invention considering that the thickness of the container mouth in the screw thread zone of the cap is always within a well defined range, and exploiting such thickness for allowing the device to be fastened and to which a suction nozzle is securable, in a removable way, in such a position that it is capable to suck the chemical product contained within the same container.

[0022] With reference to Figures 1 and 2, it is possible to observe that the preferred embodiment of the adaptor device according to the invention comprises an elastic disc 1, provided with a, preferably not axial, through hole 2 and with two housing seats 3 (shown in Figure 1 only) into which two respective tongues 4 are capable to be inserted.

[0023] A suction nozzle 5, usually in PVC, the diameter of which is slightly larger than that of the hole 2, may be inserted into the hole 2 of the disc 1.

[0024] The disc 1 is preferably made of plastic material, still more preferably of PVC. As shown in Figure 3, the annulus of the disc 1 surrounding the hole 2 is preferably subdivided into a plurality of sectors (the partitioning notches 6 of which are shown in Figure 3), more preferably equal to each other, still more preferably in a number of four. In particular, the two housing seats 3 of the tongues 4 are aligned with the radii of the hole 2 passing through the ends of a sector of the annulus (i.e. aligned with two partitioning notches 6); in this way, when the nozzle 5 is inserted into the hole 2, the pressure that it exerts onto such sector of the annulus is transmitted to the seats 3 so that the free ends of the tongues 4 inserted into such seats tend to bend towards the centre of the disc 1, producing a sort of "pinching effect".

[0025] Finally, the preferred embodiment of the adaptor device comprises a cover 7, provided with a through hole 8, of larger diameter than the one of the hole 2 of the disc 1 and sufficient to allow the insertion of the nozzle 5. In particular, when the adaptor device is assembled, the hole 2 of the disc 1 and the hole 8 of the cover 7 are obviously aligned; the correctness of alignment is ensured by the presence of a pin 9 in the lower surface of the cover 7 which must insert into a corresponding notch (not shown) of the upper surface of the disc 1. In this regard, other embodiments according to the invention may be not provided with the cover 7, that is optional.

[0026] Figures 4a, 4b and 4c just show the aforementioned pinching effect that allows the adaptor device to maintain a stable fastening to the container 10, only the portion of which corresponding to the mouth 11 is shown in the Figures, provided with a screw thread 12 into which the closing cap of the same container 10 is screwed.

[0027] In particular, it may be observed that the cover 7 is placed so that the tongues 4 housed in the disc 1

(that in Figure 4 is hidden beneath the cover 7) are in contact with the screw thread 12.

[0028] Afterwards, a nozzle 5 is inserted into the hole 2 of the disc 1 (not shown in Figure 4). Since the diameter of the nozzle 5 is slightly larger than the one of the hole 2, the nozzle 5 exerts a pressure onto the sector of the annulus of the disc 1 that is the closest to the seats 3, causing the free ends of the tongues 4 inserted into such seats to tend to bend towards the centre of the disc 1 directly engaging with the grooves of the screw thread 12. As a consequence, the free ends of the tongues 4 grips the external part of the mouth 11 of the container 10, whereas the nozzle 5 grips its internal part, thus producing the aforementioned "pinching effect" that ensures a stable fastening of the nozzle 5 to the container 10. In this way, the nozzle 5 remains in the correct position for the suction operation of the chemical product contained within the container 10.

[0029] It is immediate to realise that the adaptor device is capable to ensure such stable fastening of the nozzle 5 to the mouth 11 of the container 10 for any type of container (the thickness of the mouth 11 thereof is preferably within a predetermined range of values) and for any type of nozzle (the diameter of which is slightly larger than the one of the hole 2 of the disc 1 within a predetermined range).

[0030] The advantages offered by the adaptor device according to the invention are evident.

[0031] First of all, it allows to maintain the suction systems, in particular the suction nozzle, in the correct position and integral with the containers during the suction operation, adapting to different types of containers and to different types of nozzles.

[0032] Moreover, the adaptor device according to the invention allows a fast replacement of the chemical product containers even by unskilled personnel, and even in the case where the containers are of a different type although from the same supplier.

[0033] Finally, the adaptor device according to the invention allows to cover the whole mouth of the containers, thus avoiding that possible impurities may contaminate the chemical product contained therein.

[0034] The present invention has been described, by way of illustration and not by way of limitation, according to its preferred embodiments, but it should be understood that those skilled in the art can make variations and/or changes, without so departing from the related scope of protection, as defined by the enclosed claims.

Claims

1. Adaptor device for coupling a suction nozzle to a container, preferably containing chemical products, comprising
an at least partially elastic disc (1), provided with a through hole (2), and **characterized in that** it further comprises one or more tongues (4) coupled to the

disc (1) and projecting from one surface of the disc (1),
the disc (1) being capable to transmit a pressure exerted onto a perimeter of the through hole (2) so that a free end of each one of said one or more tongues (4) bends towards a central portion of the disc (1).

2. Adaptor device according to claim 1, **characterised in that** the disc (1) is made of plastic material, preferably PVC.
3. Adaptor device according to claim 1 or 2, **characterised in that** the through hole (2) of the disc (1) is not axial.
4. Adaptor device according to any one of the preceding claims, **characterised in that** the through hole (2) of the disc (1) is delimited by an annulus subdivided into a plurality of sectors, preferably equal to each other, more preferably equal to four.
5. Adaptor device according to claim 4, **characterised in that** at least one part of said one or more tongues (4) are aligned with one or more respective radii of the through hole (2) passing through respective ends of one or more sectors of the annulus.
6. Adaptor device according to any one of the preceding claims, **characterised in that** said one or more tongues (4) are integrally coupled to the disc (1).
7. Adaptor device according to any one of claims 1 to 5, **characterised in that** said one or more tongues (4) are housed in corresponding housing seats (3) placed on a surface of the disc (1).
8. Adaptor device according to any one of the preceding claims, **characterised in that** it further comprises a cover (7) provided with a through hole (8).
9. Adaptor device according to claim 8, **characterised in that** the cover (7) comprises at least one pin (9) capable to insert into a corresponding notch of the disc (1), so that the through hole (2) of the disc and the through hole (8) of the cover are aligned.

Patentansprüche

1. Adaptervorrichtung zur Verbindung einer Saugdüse mit einem Behälter, der vorzugsweise chemische Erzeugnisse enthält, umfassend eine zumindest teilweise elastische Scheibe (1), die mit einem Durchgangsloch (2) versehen ist, und **dadurch gekennzeichnet, dass** sie ferner umfasst eine oder mehrere Zungen (4), die mit der Scheibe (1) verbunden sind und von einer Oberfläche der Scheibe (1) vorragen, wobei

die Scheibe (1) geeignet ist, einen Druck zu übertragen, der auf einen Umfang des Durchgangslochs (2) ausgeübt wird, so dass ein freies Ende von jeder der einen oder mehreren Zungen (4) hin zu einem mittleren Bereich der Scheibe (1) biegt.

2. Adaptervorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Scheibe (1) aus Kunststoffmaterial, vorzugsweise PVC, hergestellt ist.
3. Adaptervorrichtung gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Durchgangsloch (2) der Scheibe (1) nicht axial ist.
4. Adaptervorrichtung gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** das Durchgangsloch (2) der Scheibe (1) durch einen Ring begrenzt wird, der in eine Vielzahl von Sektoren unterteilt ist, vorzugsweise zueinander gleich, besonders bevorzugt gleich 4.
5. Adaptervorrichtung gemäß Anspruch 4, **dadurch gekennzeichnet, dass** mindestens ein Teil der einen oder mehreren Zungen (4) mit einem oder mehreren entsprechenden Radien des Durchgangslochs (2) ausgerichtet sind, durch entsprechende Enden von einem oder mehreren Sektoren des Ringes hindurchtretend.
6. Adaptervorrichtung gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die eine oder mehreren Zungen (4) integral mit der Scheibe (1) verbunden sind.
7. Adaptervorrichtung gemäß einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die eine oder mehreren Zungen (4) in entsprechenden Gehäusesitzen (3) untergebracht sind, die auf einer Oberfläche der Scheibe (1) platziert sind.
8. Adaptervorrichtung gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie ferner eine Abdeckung (7) umfasst, die mit einem Durchgangsloch (8) versehen ist.
9. Adaptervorrichtung gemäß Anspruch 8, **dadurch gekennzeichnet, dass** die Abdeckung (7) mindestens einen Stift (9) umfasst, der geeignet ist, in eine entsprechende Aussparung der Scheibe (1) eingeführt zu sein, so dass das Durchgangsloch (2) der Scheibe und das Durchgangsloch (8) der Abdeckung ausgerichtet sind.

Revendications

1. Dispositif adaptateur destiné à raccorder une buse d'aspiration à un réceptif, de préférence contenant

des produits chimiques, comprenant un disque (1) au moins partiellement élastique (1) présentant un trou traversant (2) et **caractérisé en ce qu'il** comprend en outre une ou plusieurs languettes (4) solidaires du disque (1) et faisant saillie à partir d'une surface du disque (1),

le disque (1) étant capable de transmettre une pression exercée sur le périmètre du trou traversant (2) de telle sorte que l'extrémité libre de chacune desdites une ou plusieurs languettes (4) s'incurve en direction de la partie centrale du disque (1).

2. Dispositif adaptateur selon la revendication 1, **caractérisé en ce que** le disque (1) est fait de matière plastique, de préférence de PVC. 15
3. Dispositif adaptateur selon la revendication 1 ou 2, **caractérisé en ce que** le trou traversant (2) du disque (1) n'est pas axial. 20
4. Dispositif adaptateur selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** le trou traversant (2) du disque (1) est délimité par un anneau subdivisé en une pluralité de secteurs, de préférence égaux entre eux, de préférence au nombre de quatre. 25
5. Dispositif adaptateur selon la revendication 4, **caractérisé en ce qu'au** moins une partie desdites une ou plusieurs languettes (4) est alignée avec un ou plusieurs des rayons respectifs du trou traversant (2) qui passent par des extrémités respectives d'un ou de plusieurs secteurs de l'anneau. 30
6. Dispositif adaptateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdites une ou plusieurs languettes (4) sont attachées au disque (1) de façon intégrée. 35
7. Dispositif adaptateur selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** lesdites une ou plusieurs languettes (4) sont logées dans des logements correspondants (3) situés sur une surface du disque (1). 40
8. Dispositif adaptateur selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend en outre un couvercle (7) muni d'un trou traversant (8). 45
9. Dispositif adaptateur selon la revendication 8, **caractérisé en ce que** le couvercle (7) comprend au moins un ergot (9) capable de s'insérer dans une encoche correspondante du disque (1), de telle sorte que le trou traversant (2) du disque et le trou traversant (8) du couvercle sont alignés. 50

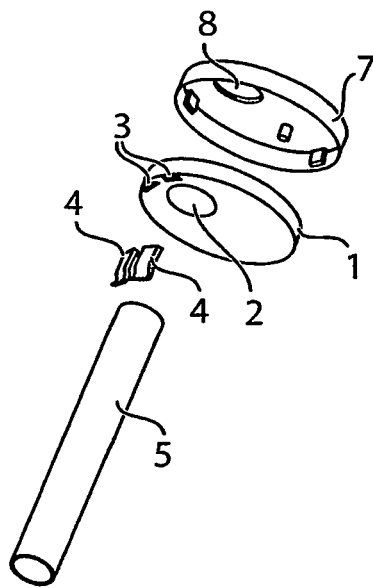


Fig. 1

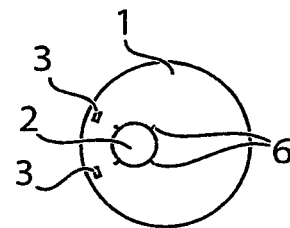


Fig. 3

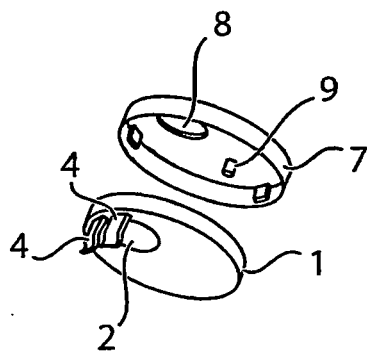


Fig. 2

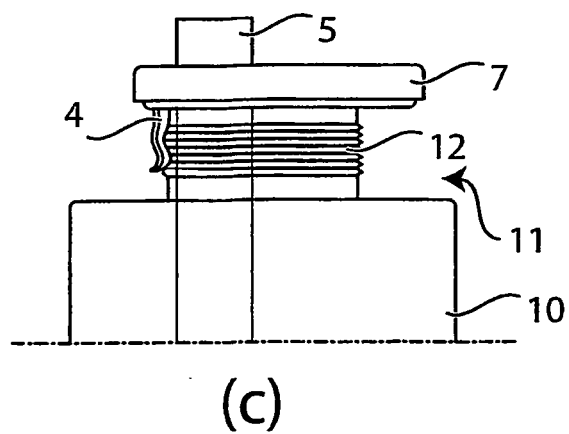
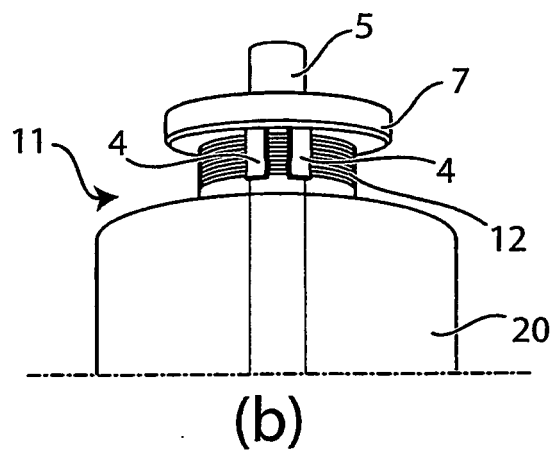
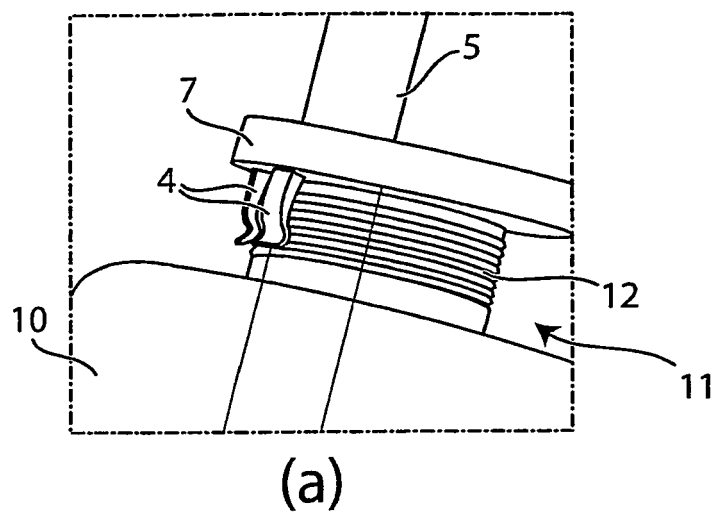


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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