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METERING CONTAINER AND SUPPORT THEREFOR

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(56) Prior Art Documents
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(57) Claim

1. A metering container for viscous thixotropic liquids, comprising:

a container having a container wall and a container space, said container having a lower end;

a substantially circular mouthpiece at said lower end of said container, said mouthpiece having a central axis and a mouthpiece wall with a first slot opening arranged eccentrically with respect to said central axis, said first slot opening being elongated and having a longitudinal axis extending substantially parallel to a plane through said central axis;

closing means in the region of said first slot opening comprising a rotary slide rotatable about said central axis and having a rotary slide wall substantially parallel to said mouthpiece wall, with a second slot opening arranged substantially as eccentrically and parallel to said central axis as said first slot opening, said second slot opening being at least approximately the same size as said first slot opening;

means for rotating said rotary slide from an open position in which said first slot opening and said second slot opening are arranged one above the other to a closed position in which said first slot opening is covered by said rotary slide wall and said second slot opening is covered by said mouthpiece wall;

said first slot opening and said second slot opening having straight longitudinal edges that make an adjustable angle with one another in the manner of scissors on rotation of said rotary slide; and

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at least one applicator roller arranged on said rotary slide, having an axis of rotation running substantially parallel to said longitudinal axis of said second slot opening, said applicator roller having a roller surface that runs close to said second slot opening.

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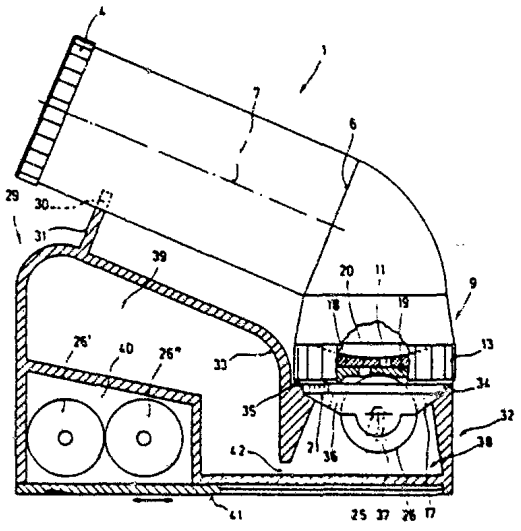
(54) Title: METERING CONTAINER AND SUPPORT THEREFOR

(54) Bezeichnung: DOSIERBEHÄLTER UND STÜTZKONSTRUKTION HIEFÜR

(57) Abstract

A substantially circular nozzle (9) with a slot aperture (11) is fitted to a metering container (1) for viscous fluids. The slot aperture (11) is arranged eccentrically to the axis of the nozzle (9) and is located in a nozzle wall (18). A rotary slide (17) with a wall (19) parallel to the nozzle wall (18) is rotatably secured on the nozzle (9) and has an eccentric slot (20) which can be taken from a closed position in which each wall (18; 19) covers the slot (11; 20) in the wall (19; 18) parallel thereto to an open position in which the slots (11, 20) coincide. The container (1) is preferably angled in relation to the nozzle (9) and can be held by a support structure (29, 32) consisting of a support section (29) and a container section (32) to receive at least the rotary slide (17).



(57) Zusammenfassung

An einem Dosierbehälter (1) für viskose Flüssigkeiten ist an der Unterseite ein etwa kreisrundes Mundstück (9) mit einer Schlitzöffnung (11) vorgesehen. Die Schlitzöffnung (11) ist exzentrisch zur Achse dieses Mundstückes (9) angeordnet und befindet sich in einer Mundstückwandung (18). Am Mundstück (9) ist ein Drehschieber (17) mit zur Mundstückwandung (18) paralleler Wandung (19) um die Mundstückachse drehbar gelagert und weist einen ebenso exzentrischen Schlitz (20) auf, der aus einer Geschlossenstellung, in der jede Wandung (18; 19) den jeweiligen Schlitz (11; 20) in der dazu parallelen Wand (19; 18) abdeckt, in eine Offenstellung bringbar ist, in der die Schlitze (11, 20) übereinanderliegen. Vorzugsweise ist der Behälter (1) gegenüber dem Mundstück (9) abgeknickt und kann durch eine Stützkonstruktion (29, 32) gehalten werden, die aus einem Stützabschnitt (29) und einem Behälterabschnitt (32) zur Aufnahme wenigstens des Drehschiebers (17) besteht.

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METERING CONTAINER AND SUPPORT CONSTRUCTION FOR THIS PURPOSE

In addition to the thixotropic liquids, viscous liquids form an important group among the liquids with non-Newtonian behavior, which require special measures and means for their handling. This also applies to the design of metering containers.

The invention relates to a metering container for viscous liquids, having an opening in a container space for the viscous liquids and means for closing the container opening.

A metering container has been disclosed in, for example, DE-C-1 206 141 for the application of glue. Two closing means are provided for closing the container, namely a slide for separating the container space from the applicator roller and two slides which can be moved toward one another in the manner of a gate, overlap the applicator roller and are intended to prevent drying out.

On the one hand, the inner slide which closes the container space presented a problem since it had to be operated from the outside, which made sealing difficult, especially since one section of the slide was always outside the container and one section inside, and there was always displacement between these parts during opening and closing. During these movements, the adhering glue was conveyed to the outside and could drip freely there, so that the work was not clean.

On the other hand, operation of the two outer slides with the aid of a cord pull against the force of a spring was not only rather complicated in design and susceptible to faults, but it did not prevent drying out during long periods of standing, which - owing to the large number of parts - then led to complicated cleaning work.

For non-adhesive substances, various metering containers have been proposed, for example in US-E-28 120. However, these are sector-like slots which extend parallel to the circumference of the rotary slide and on the one hand permit only a limited application width and on the other hand could not completely prevent thread formation when tacky substances were used, since both slots are located on the same radius and there would be a thread-cutting shearing effect only when their edges are moved toward one another. Furthermore, their edges curved with respect to a chord plane relative to their curvature result in nonuniform glue application so that for this reason alone they are unsuitable for this purpose.

FR-A-1 197 509 adopted another approach to the solution of the problem. There, a metering roller acting on the actual applicator roller itself defines two metering gaps on its two sides. This metering roller is arranged exactly in the bottom opening of the container and projects partly into the container space and partly outside. To close the two gaps remaining at its two sides, a thin spindle is inserted in each case between the metering roller and the concave container bottom and is intended to cover the gap.

A precondition of this solution is that the two spindles are produced very precisely in order to avoid leaving a cavity, and that the glue (or another viscous liquid) contains no lumps or impurities which could become lodged between the spindles and the container wall and thus prevent the sealing effect of the two spindles. In addition, during operation the metering roller continuously rubs against one of the spindles, which therefore impairs the functioning and the rotation of this roller, while the spindle on the other side of the metering roller is constantly raised from its sealing position as a result of its rotation, after which a return to the sealing position within the viscous medium is not ensured by anything.

However, if leaks occur in the known embodiments, the viscous liquid flows out in thin threads which are deposited everywhere and are difficult to remove.

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein a metering container for viscous thixotropic liquids, comprising:

a container having a container wall and a container space, said container having a lower end,

a substantially circular mouthpiece at said lower end of said container, said mouthpiece having a central axis and a mouthpiece wall with a first slot opening arranged eccentrically with respect to said central axis, said first slot opening being elongated and having a longitudinal axis extending substantially parallel to a plane through said central axis;

closing means in the region of said first slot opening comprising a rotary slide rotatable about said central axis and having a rotary slide wall substantially parallel to said mouthpiece wall, with a second slot opening arranged substantially as eccentrically and parallel to said central axis as said first slot opening, said second slot opening being at least approximately the same size as said first slot opening;

means for rotating said rotary slide from an open position in which said first slot opening and said second slot opening are arranged one above the other to a closed position in which said first slot opening is covered by said rotary slide wall and said second slot opening is covered by said mouthpiece wall;

said first slot opening and said second slot opening having straight longitudinal edges that make an adjustable angle with one another in the manner of scissors on rotation of said rotary slide; and

at least one applicator roller arranged on said rotary slide, having an axis of rotation running substantially parallel to said longitudinal axis of said second slot opening, said applicator roller having a roller surface that runs close to said second slot opening.

There is further disclosed herein a metering container for viscous thixotropic liquids, comprising:

a container having a container wall, said container having a lower end;

a substantially circular mouthpiece at said lower end of said container, said mouthpiece having a central axis and a mouthpiece wall with a first slot opening arranged eccentrically with respect to said central axis, said first slot opening being elongated and having a longitudinal axis extending substantially parallel to a plate through said central axis;

closing means in the region of said first slot opening comprising a rotary slide rotatable about said central axis and having a rotary slide wall substantially parallel to said mouthpiece wall, with a second slot opening arranged substantially as eccentrically and parallel to said central axis as said first slot opening, said second slot opening being at least approximately the same size as said first slot opening;

means for rotating said rotary slide from an open position in which said first slot opening and said second slot opening are arranged one above the other to a closed position in which said first slot opening is covered by said rotary slide wall and said second slot opening is covered by said mouthpiece wall;

said first slot opening and said second slot opening having straight longitudinal edges that make an adjustable angle with one another in the manner of scissors on rotation of said rotary slide;

at least one applicator roller arranged on said rotary slide, having an axis of rotation running substantially parallel to said longitudinal axis of said second slot opening, said applicator roller having a roller surface that runs close to said second slot opening;

a projecting surface projecting from said mouthpiece; and

a support construction having a container section for holding said rotary slide,

wherein said support construction comprises a housing with housing walls enclosing at least one cavity, and said support construction and said container section are arranged to receive said projecting surface and said slide in an opening in said container section in a plate that is substantially horizontal in use.

Further details of the invention are evident from the following description of an embodiment shown schematically in the drawings.

Fig. 1 shows a longitudinal section of a preferred embodiment of a metering container according to the invention, of which

Fig. 2 shows a section along the line II-II of Fig. 1;

Fig. 3 shows the metering container according to Fig. 1 in side view but with its rotary slide in the closed position when the container is supported on a support construction shown in section; and

Fig. 4 shows a spare roller with reduced length in longitudinal section or an axial plan view.

A metering container 1 according to Fig. 1 has a container space 3 which is surrounded by container walls 2 and can be closed by a cover 4 which can be snapped on or screwed on. The latter preferably has, in its upper part, an opening 4' through which air can flow into the container space 3 during metering of the viscous liquid, in order to prevent the generation of reduced pressure, which might prevent further flow. In the rest position, the opening 4' is preferably closable by a spring cover or the like (not shown), in order to prevent drying out. A bent section 5 is located at the lower end of container 1, which end is opposite the cover 4; the bent section can be formed as an integral part with the container wall 2 in the embodiment shown but in the case of Fig. 3 may be formed as a separately produced part joined to the

container wall 2, along the parting surface 6 shown there with a solid line, if this facilitates production.

The container space 3 is extended along an axis 7 and only of limited diameter so that it can be gripped with a hand on the outside in the manner of a handle. Its circumference is therefore preferably less than 40 cm, whereas its length is not critical. A circumference of 30 to 35 cm best meets the requirements for as large a volume as possible in conjunction with adequate convenience of handling.

To comply with its intended use as a handle, the container axis 7 makes an angle of less than 90° with an axis 8 of the bent section 5 and of a connected mouthpiece 9, i.e. it makes an angle α of 45° to 80° (in an upward direction), preferably 60° to 75°, with the axis 8, so that the container space 3 projects slightly upward.

As can be seen, the mouthpiece 9 can be produced as a separate part and then connected to the section 5. Connection is preferably effected by snapping on by means of catch-like groove and spring surfaces 10 which engage one another. Advantageously, catches (not shown) are provided here on rotation at 0° and 90°, in order to facilitate the setting of the operating position and of the rest position. To apply glue from the container space 3, 5 to the lateral edge 45 (at right angles to the plane of the drawing) of a furniture panel lying in the plane of the drawing in Fig. 1, the container space 3 is rotated through 90° about the axis 8 relative to its mouthpiece 9 so that it projects upward at right angles out of the plane of the drawing and also covers the entire slot opening 20 with glue even when the container space 3 is only

partly full. Such a snap connection, for which incisions can also be made in the inner wall of the section 5 in order to form the surfaces 10 on flexible tongues, is particularly easy to produce if the metering container 1 consists of plastic.

The mouthpiece 9 has a linear slot opening 11 with a slot axis 12 outside the axis 8 on its cambered bottom 9'. This slot opening 11 is preferably located on that side which is opposite the container space 3 and its bent axis 7. It is also preferable if the bottom 9' does not have a cap-like camber but is in the form of an inverted roof, the slot 11 forming the ridge, because the slot depth can then be kept constant over the entire slot length and hence uniform metering of the viscous liquid over the entire width can be ensured.

The section in Fig. 2 furthermore shows that at least the mouthpiece 9 is at least almost circular in plan view (apart from any added projections) and carries a rotary bearing 13 at its circumference. This bearing 13 may also be in the form of a union nut. The rotary slide 17 (see below) is then tapered at its circumference, as indicated by the arrow 15' on the right side of Fig. 1. Its inward-pointing rotary bearing surfaces 14, 15 (left in Fig. 1), of which the latter serve as retaining surfaces, can be formed from softer, close-fitting and therefore sealing material. This is not in contradiction to the requirement for an exact rotary bearing guidance if the mouthpiece 9 additionally has a centering surface 16 in the form of an annular groove (a projection or a number thereof would also be possible).

These bearing surfaces 14 to 16 serve as a bearing for a rotary slide 17 which is mounted on the mouthpiece 9

and has a rotary slide wall 19 parallel to the mouthpiece wall 18. The rotary bearing surfaces 14, 15 define an axis of rotation which coincides with the axis 8. However, the rotary slide 17 also has a slot 20 which in an open position (according to Fig. 1) is at least almost flush or congruent with the slot opening 11 and is located at slot axis 12, which, as mentioned, is arranged eccentrically with respect to the axis of rotation 8. Thus, if the rotary slide 17 is rotated about its axis of rotation 8, after a rotation of 180° the slot 20 can reach the closed position which is indicated by a dashed line in Fig. 3 and in which the rotary slide wall 19 covers the slot opening 11, and the mouthpiece wall 18 covers the slot 20. In the closed position, the adjacent edges of slot 20 and slot opening 11 are preferably a distance apart - even if only a small distance.

In such a rotary movement, there are a number of intermediate positions in which the edges of the two openings have a scissors-like action (cf. the dash-dot position of the slot opening 11 relative to the slot 20 in Fig. 2) and thus prevent thread formation by the viscous liquid by means of a cutting procedure. However, this geometric circumstance can also if desired be utilized for changing the length of the uncovered opening cross-section by rotation of the rotary slide 17 if, for example, it is intended to glue edges of different widths. In such a case, it is expedient if mouthpiece 9 and rotary slide 17 have scale markings 21 which cooperate with one another (Fig. 3) and indicate the width of the uncovered opening cross-section. Furthermore, it may be expedient to coordinate catches with certain slot widths; the rotary slide 17 may therefore also be polygonal.

Such a catch for the open position of the rotary slide 17 is shown in Fig. 1. The rotary slide 17 has a catch projection 22, which may be spring-loaded, and which projects slightly beyond the height of an annular centering projection 23 (shown in section in Fig. 2) which engages the groove 16, so that said locking projection can fall into a catch indentation 24 of the mouthpiece 9. Here too, there is an advantage due to the intrinsic resilience of the material if at least the rotary slide 17 consists of plastic. If the catch projection 22 is spring-loaded, it may interfere with the tightness, owing to the pressure exerted on the opening; it is therefore preferable to allow it to rest in a groove running along a semicircle, in each case at 0° and 180°.

In the embodiment shown, the rotary slide 17 has an applicator roller 26 which is mounted on an axle 25 (which is preferably in the form of a spring bolt which has a snap fit in the axle hole) and whose geometric axis 27 is likewise arranged eccentrically with respect to the axis of rotation 8 but is preferably offset to the left relative to the slot axis 12 in the direction of the end axis 7 (based on Fig. 1). The effect thus achieved is clearly recognizable in Fig. 1 since flowing of the liquid onto the applicator roller 26 is facilitated on that side which faces away from the container space 3 and which becomes the front during gluing, but becomes more difficult on the side of the container space 3 (the rear), which is assisted by a surface section 28 of the rotary slide wall 19, which section continues around the roller 26 and thus has a somewhat arc-like shape. The play between the roller 26 and the rotary slide 17 is otherwise kept as small as shown in Fig. 1 not only in the surface section 28 but (as indicated by the dashed line) also as far as the lower outflow 17'.

Of course, mounting an applicator roller 26 is preferable but not absolutely essential. It would be just as possible to provide an applicator brush, or two or more rollers could interact with one another at the rotary slide 17, one of which rollers, for example, is a metering roller as disclosed in FR-A-1 197 509, or two rollers together form a liquid intake gap (cf. DE-U-75 38 002).

The reason why it is advantageous to bend the axes 7, 8 relative to one another has been described above. Particularly under these conditions, however, setting up and storing such a metering container 1 is difficult, especially when it should not be allowed to rest on the applicator roller 26 provided with tacky liquid. It is therefore advantageous if the container 1 is provided with a support construction as shown, for example, in Fig. 3. At least with regard to a support section 29, this support construction can in principle be connected to the container 1, but the latter is of course easier to handle if the entire support construction is formed as a separate part.

In Fig. 3, the support section 29 has a trough 30, in particular on a web 31, which trough holds part of the container wall 2 at its lower surface. Adjacent to the support section 29 is a container section 32 which holds the mouthpiece 9 or the rotary slide 17 and in which at least part of the rotary slide 17 dips, if necessary also part of the mouthpiece 9, in which case the container section 32 could be provided on its right side too (based on Fig. 3) with a higher wall, similarly to a curved wall section 33 on its left side, in order more or less to surround the mouthpiece 9.

The container section 32 preferably has a shoulder 34 which surrounds it in the manner of a ring in order to

serve as a support surface for a projecting mouthpiece section 35, which in this case is annular. In the container 1 used, the container section 32 can be filled with water up to this shoulder 34 in order to dissolve glue (or another viscous liquid) adhering to the rotary slide 17. The rotary slide with a conical actuating surface 36 for executing its rotation, and with the axle 25 for the bearing pieces 37 carrying the applicator roller 26, therefore project into the interior of the container section for this purpose. The bearing pieces 37 are preferably not concentric with the roller 26 but are broadened (as indicated by the dashed line in Fig. 3), to prevent to carrying over of excess glue.

The inner space 38 is expediently connected to a relatively large container space 39 to prevent the dissolved viscous liquid inside the space 38 from becoming too concentrated. For this purpose, the space below the supporting web 31 is utilized for accommodating the space 39, but expediently also a space 40 for spare rollers 26', 26'', if necessary of different axial length and/or different surface area or different diameter. The space 40 can be closed by a door 41 (in particular a sliding door); the space 39 can be made accessible by an opening, for example a screwable opening, which is not shown, for filling with water.

It is clear that the spaces 38, 39 communicate with one another via a common opening 42, but it may be desired also to provide an upper opening in addition to this lower communicating opening 42. Finally, it would also be possible to accommodate a pump or the like inside the space 39 in order to keep the water in motion and thus facilitate the cleaning process.

It is clear that, by means of the arrangement according to the invention and the embodiment of the rotary slide 17, no surface smeared with viscous liquid, such as glue, can reach the outside, since all surfaces coming into contact with this liquid, in particular on the walls 18 and 19, are always enclosed by the bearing surfaces 14, 15 of the bearing 13. For cleaning purposes, it may be desirable to provide the bearing 13 with an internal thread adjacent to the surface 14, which thread cooperates with a corresponding external thread on the mouthpiece 9.

Fig. 4 shows a spare roller 126 of reduced length on its axle 25' on which a plate 43, 44 which is firmly connected to the axle 25' is adjacent to the roller 126 and, by means of a projection 43, engages the slot 20 and closes its region not arranged above the rotatable roller 126, thus preventing the emergence of glue there. On that side of the plate which is opposite the projection 43 is a projection 44 which serves for resting against the surface of, for example, a blockboard if its narrow edge is to be provided with a glue coat and the apparatus according to the invention is slid along it.

The invention is suitable not only for applying glue to edges of blockboards or furniture panels but - if necessary with adaptation of the individual parts and dimensions - also, for example, for fastening flexible skirting boards to vertical walls, for stripwise application of glue in office, household or hobby work, etc.

Many modifications are of course possible within the scope of the invention; thus, the centering surfaces 16, 23 (the projecting and the indented part of which may also be arranged in the converse order) need not be

present but, as can be seen, are expediently in the region of the circumference of the rotary slide wall 19. The support container 32, 39, at least without the chamber 40, can also be blow-molded, which is substantially more economical than the embodiment according to Fig. 3, which is to be produced only by injection molding.

The claims defining the invention are as follows:

1. A metering container for viscous thixotropic liquids, comprising:

a container having a container wall and a container space, said container having a lower end;

a substantially circular mouthpiece at said lower end of said container, said mouthpiece having a central axis and a mouthpiece wall with a first slot opening arranged eccentrically with respect to said central axis, said first slot opening being elongated and having a longitudinal axis extending substantially parallel to a plane through said central axis;

closing means in the region of said first slot opening comprising a rotary slide rotatable about said central axis and having a rotary slide wall substantially parallel to said mouthpiece wall, with a second slot opening arranged substantially as eccentrically and parallel to said central axis as said first slot opening, said second slot opening being at least approximately the same size as said first slot opening;

means for rotating said rotary slide from an open position in which said first slot opening and said second slot opening are arranged one above the other to a closed position in which said first slot opening is covered by said rotary slide wall and said second slot opening is covered by said mouthpiece wall;

said first slot opening and said second slot opening having straight longitudinal edges that make an adjustable angle with one another in the manner of scissors on rotation of said rotary slide; and

at least one applicator roller arranged on said rotary slide, having an axis of rotation running substantially parallel to said longitudinal axis of said second slot opening, said applicator roller having a roller surface that runs close to said second slot opening.

2. A container as claimed in claim 1, wherein said mouthpiece comprises a body separate from said container wall and is connected thereto, said body being rotatable with respect to said container.

3. A container as claimed in claim 1 or claim 2, further comprising rotary bearing surfaces connected to said mouthpiece for keeping said rotary slide centered in the region of the circumference of said rotary slide.

4. A container as claimed in claim 3, wherein said rotary bearing surfaces comprise a retaining surface engaging at said circumference of said rotary slide and a projecting annular centering surface.

5. A container as claimed in claim 4, wherein said rotary bearing surfaces are composed of plastic material.

6. A container as claimed in claim 3, wherein said rotary bearing surfaces are composed of plastic material.

7. A container as claimed in any one of claims 1 to 6, wherein said container space has a longitudinal axis that is bent by a pre-determined angle between 0° and 90° relative to said central axis of said mouthpiece, said container further comprising a support construction supporting said bent container space.

8. A container as claimed in claim 7, wherein said bent longitudinal axis of said container space is bent at a predetermined angle between 45° and 80° relative to said central axis of said mouthpiece.

9. A container as claimed in claim 8, wherein said bent longitudinal axis of said container space is bent at a predetermined angle between 60° and 75° relative to said central axis of said mouthpiece.

10. A container as claimed in any one of claims 7 to 9, wherein said support construction has a support section for holding said bent container space and a container section connected to said support section for holding at least one part of said rotary slide.

11. A container as claimed in any one of claims 1 to 10, wherein said second slot opening is elongated and has a longitudinal axis, and said axis of rotation of said applicator roller is offset relative to said longitudinal axis of said second slot opening.

12. A container according to claim 11, wherein said axis of rotation of said applicator roller is offset relative to said longitudinal axis of said second slot opening in the direction of said central axis of said mouthpiece, in said open position of said rotary slide.

13. A container as claimed in any one of claims 1 to 12 further comprising at least one catch for determining at least one rotary position of said rotary slide.

14. A container as claimed in claim 13, wherein said catch determines said open position of said rotary slide.

15. A container as claimed in claim 13 or claim 14, wherein said catch is composed of plastic material.

16. A metering container for viscous thixotropic liquids, comprising:

a container having a container wall, said container having a lower end;

a substantially circular mouthpiece at said lower end of said container, said mouthpiece having a central axis and a mouthpiece wall with a first slot opening arranged eccentrically with respect to said central axis, said first slot opening being elongated and having a longitudinal axis extending substantially parallel to a plate through said central axis;

closing means in the region of said first slot opening comprising a rotary slide rotatable about said central axis and having a rotary slide wall substantially parallel to

said mouthpiece wall, with a second slot opening arranged substantially as eccentrically and parallel to said central axis as said first slot opening, said second slot opening being at least approximately the same size as said first slot opening;

means for rotating said rotary slide from an open position in which said first slot opening and said second slot opening are arranged one above the other to a closed position in which said first slot opening is covered by said rotary slide wall and said second slot opening is covered by said mouthpiece wall;

said first slot opening and said second slot opening having straight longitudinal edges that make an adjustable angle with one another in the manner of scissors on rotation of said rotary slide;

at least one applicator roller arranged on said rotary slide, having an axis of rotation running substantially parallel to said longitudinal axis of said second slot opening, said applicator roller having a roller surface that runs close to said second slot opening;

a projecting surface projecting from said mouthpiece; and

a support construction having a container section for holding said rotary slide,

wherein said support construction comprises a housing with housing walls enclosing at least one cavity, and said support construction and said container section are arranged to receive said projecting surface and said slide in an opening in said container section in a plate that is substantially horizontal in use.

17. A metering container substantially as hereinbefore described with reference to the accompanying drawings.

DATED this Eighth Day of August 1994

Kurt Lampert

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

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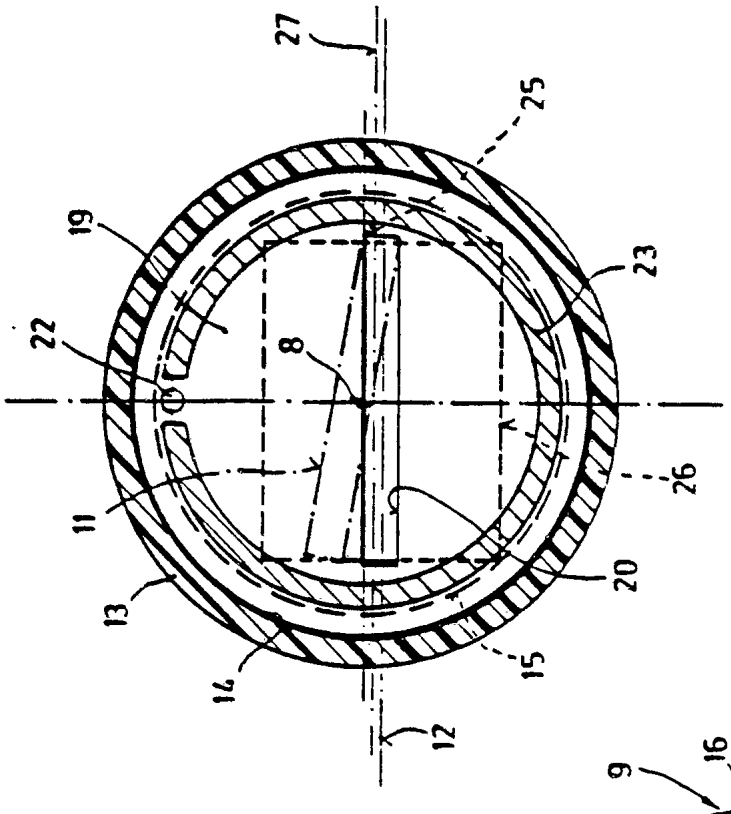


Fig.2

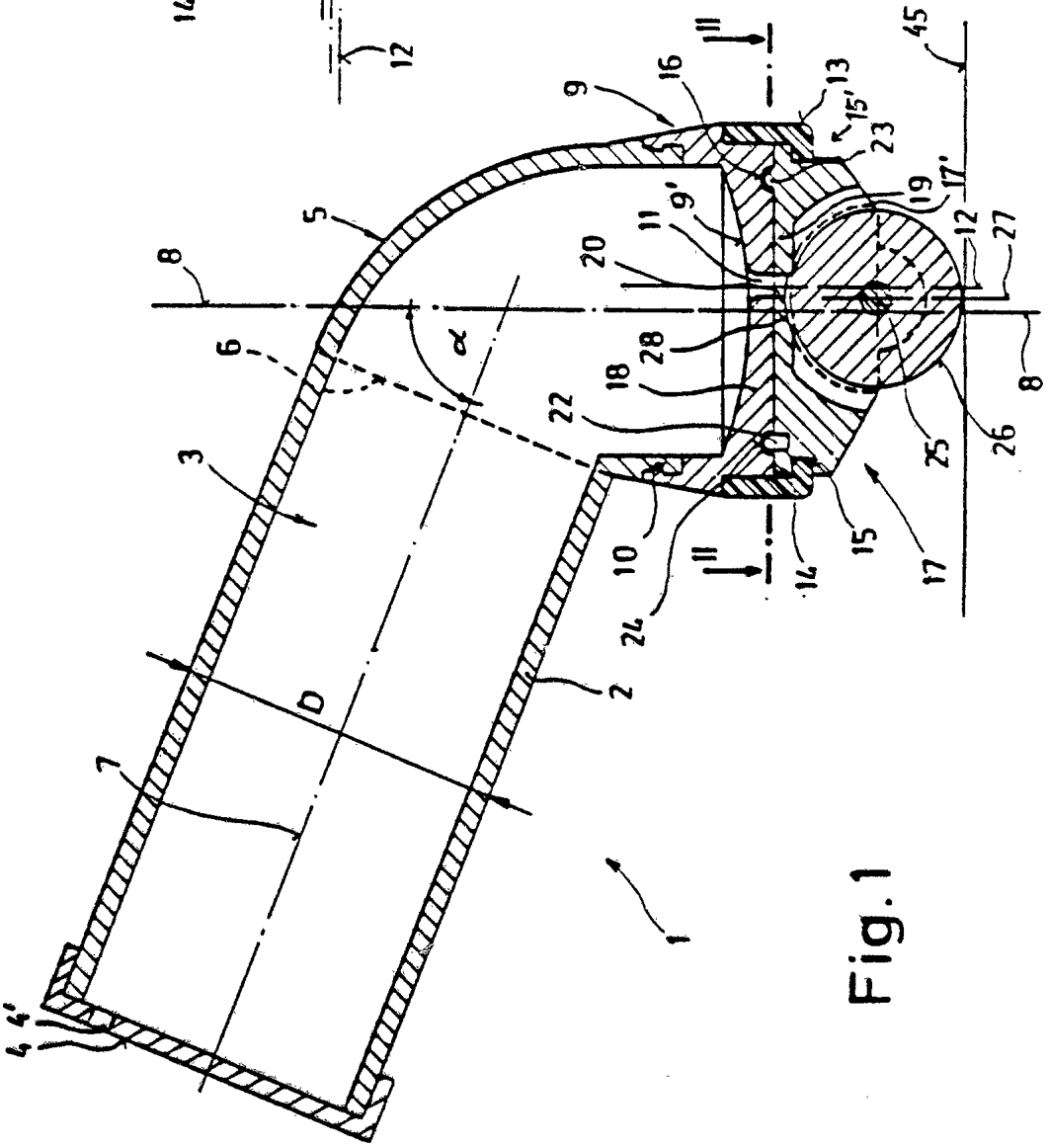
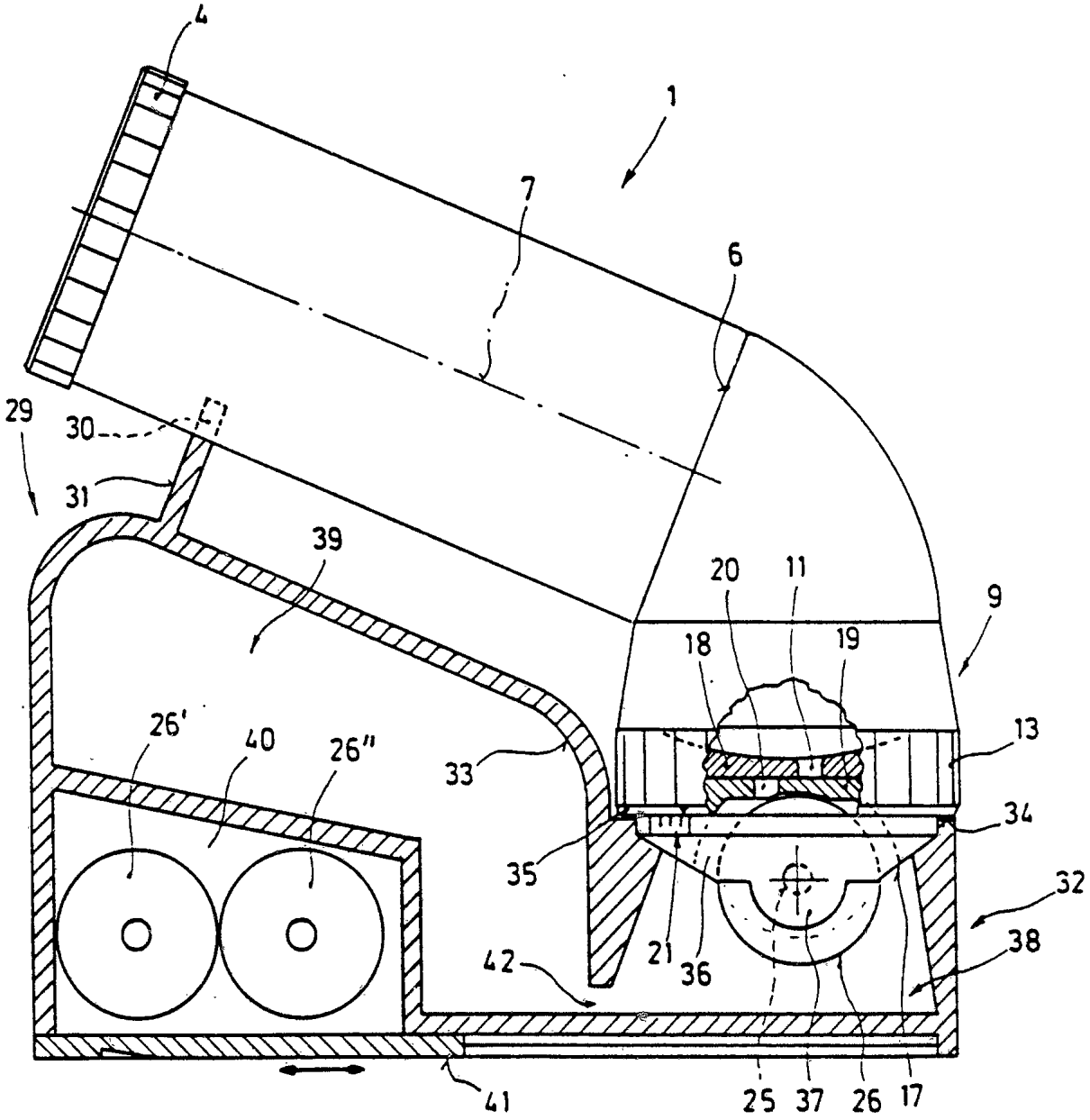


Fig.1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42
21
36
41
25
37
26
17

Fig. 3

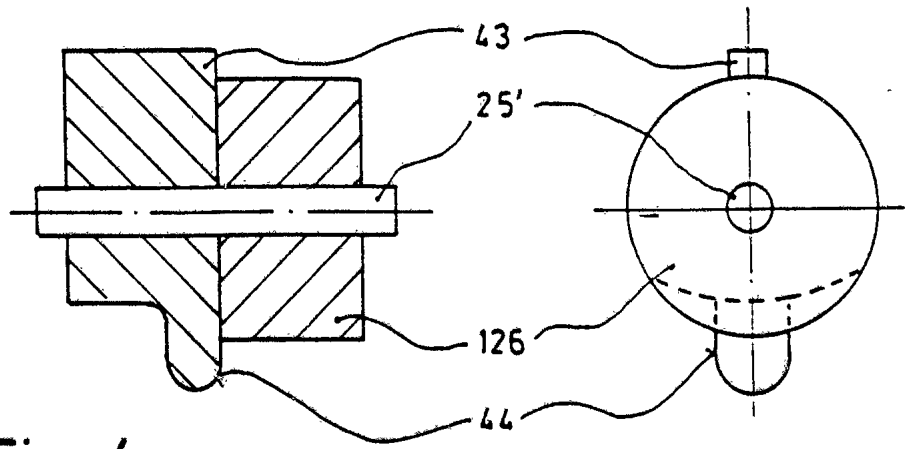
43
25'
126
44

Fig. 4

INTERNATIONAL SEARCH REPORT

International Application No PCT/CH 91/00192

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl.[5]: B 05 C 17/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
Int.Cl.[5]:	B 05 C; B 27 G

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X	US, E, 28 120 (PLUMER) 20 August 1974 3658213 see the whole document -.-	1,4,6
A	US, E, 28 120 (PLUMER) 20 August 1974 see the whole document -.-	3
A	FR, A, 2 557 816 (BOUYER) 12 July 1985 see page 3, line 25 - line 40 see page 4, line 1 - line 13; figure 2 -.-	1
A	FR, A, 1 290 215 (PUGGIONI) 5 March 1962 see the whole document -.-	1
A	DE, C, 494 453 (DÖRR) 25 March 1930 see the whole document -.-	1
A	DE, B, 1 206 141 (NEUMANN) 20 June 1964 cited in the application see the whole document -.-	1
A	FR, A, 1 197 509 (SCHIESTL) 1 December 1959 cited in the application see the whole document -.-	1
A	CH, A, 594 447 (STEINER LAMELLO AG) 13 January 1978 ./.	8-10

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
18 October 1991 (18.10.91)	25 October 1991 (25.10.91)
International Searching Authority	**Signature of Authorized Officer**
European Patent Office	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
	see page 1, line 1 - line 25; figures 1,2	
	-.-	
A	DE, A, 3 526 734 (WEINGARDT) 29 January 1987 see abstract; figure 1	8-10
	-.-	
A	DE, U, 7 538 002 (HORST KIRCHNER MASCHINENBAU) 22 April 1976 cited in the application see the whole document	

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. CH 9100192 SA 50666

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 18/10/91
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-E-28120	20-08-74	None	
FR-A-2557816	12-07-85	None	
FR-A-1290215		None	
DE-C-494453		None	
DE-B-1206141		None	
FR-A-1197509		None	
CH-A-594447	13-01-78	None	
DE-A-3526734	29-01-87	None	
DE-U-7538002		None	

INTERNATIONALER RECHERCHENBERICH

Internationales Aktenzeichen PCT/CH 91/00192

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben)[6]

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

Int.Kl. 5 B05C17/00

II. RECHERCHIERTE SACHGEBIETE

Recherchierter Mindestprüfstoff [7]

Klassifikationssytem	Klassifikationssymbole
Int.Kl. 5	B05C ; B27G

Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen [8]

III. EINSCHLAGIGE VEROFFENTLICHUNGEN [9]

Art.°	Kennzeichnung der Veröffentlichung [11], soweit erforderlich unter Angabe der maßgeblichen Teile [12]	Betr. Anspruch Nr.[13]
X	US,E,28 120 (PLUMER) 20. August 1974 siehe das ganze Dokument	1,4,6
A	US,E,28 120 (PLUMER) 20. August 1974 siehe das ganze Dokument	3
A	FR,A,2 557 816 (BOUYER) 12. Juli 1985 siehe Seite 3, Zeile 25 - Zeile 40 siehe Seite 4, Zeile 1 - Zeile 13; Abbildung 2	1
A	FR,A,1 290 215 (PUGGIONI) 5. März 1962 siehe das ganze Dokument	1
A	DE,C,494 453 (DÖRR) 25. März 1930 siehe das ganze Dokument	1
A	DE,B,1 206 141 (NEUMANN) 20. Juni 1964 in der Anmeldung erwähnt siehe das ganze Dokument	1

° Besondere Kategorien von angegebenen Veröffentlichungen [10]:

"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist

"E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist

"L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)

"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht

"P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist

"T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist

"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden

"Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist

"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

IV. BESCHEINIGUNG

Datum des Abschlusses der internationalen Recherche	Absendedatum der internationalen Recherchenberichts
18.OKTOBER 1991	25. 10. 91
Internationale Recherchenbehörde	**Unterschrift des bevollmächtigten Bediensteten**
EUROPAISCHES PATENTAMT	SCHOELVINCK F.S.

III. EINSCHLAGIGE VEROFFENTLICHUNGEN (Fortsetzung von Blatt 2)

Art *	Kennzeichnung der Veröffentlichung, soweit erforderlich unter Angabe der maßgeblichen Teile	Betr. Anspruch Nr.
A	FR,A,1 197 509 (SCHIESTL) 1. Dezember 1959 in der Anmeldung erwähnt siehe das ganze Dokument	1
A	CH,A,594 447 (STEINER LAMELLO AG) 13. Januar 1978 siehe Seite 1, Zeile 1 - Zeile 25; Abbildungen 1,2	8-10
A	DE,A,3 526 734 (WEINGARDT) 29. Januar 1987 siehe Zusammenfassung; Abbildung 1	8-10
A	DE,U,7 538 002 (HORST KIRCHNER MASCHINENBAU) 22. April 1976 in der Anmeldung erwähnt siehe das ganze Dokument	

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.

CH 9100192
SA 50666

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben.
Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am 18/10/91
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
US-E-28120	20-08-74	Keine	
FR-A-2557816	12-07-85	Keine	
FR-A-1290215		Keine	
DE-C-494453		Keine	
DE-B-1206141		Keine	
FR-A-1197509		Keine	
CH-A-594447	13-01-78	Keine	
DE-A-3526734	29-01-87	Keine	
DE-U-7538002		Keine	

EPO FORM P0473