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(54) **A DEVICE FOR AND A METHOD OF TREATING THE INNER SURFACE OF A CONTAINER**

VORRICHTUNG UND VERFAHREN ZUR BEHANDLUNG DER INNEREN OBERFLÄCHE EINES BEHÄLTERS

DISPOSITIF ET PROCEDE DE TRAITEMENT DE LA SURFACE INTERIEURE D'UN RECIPIENT

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(56) References cited:
EP-A- 0 137 416
DE-A- 4 229 250
US-A- 5 286 302
WO-A-91/00154
US-A- 1 843 036

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Description

THE BACKGROUND OF THE INVENTION AND PRIOR ART

[0001] The present invention refers to a device for the treatment of the inner surface of a container according to the preamble of claim 1. Such a device is disclosed in US-A-5 286 302. The device known is intended for cleaning bulk containers of vehicles. The invention also refers to a method for the treatment of the inner surface of a container having an opening.

[0002] The present invention is now to be described in connection with cleaning of pots for large kitchens, restaurants etc. However, the invention is not limited to this application but may be employed for the cleaning or any other treatment, such as for instance painting of many different types of containers.

[0003] It is known to clean large pots and similar containers in large kitchens and restaurants manually by means of brushes and cleaning liquid. This cleaning work is very heavy and labour-consuming since relatively hard coatings are formed on the inner surface of the pots. Moreover, the work frequently is to be performed in uncomfortable working positions. In addition, this cleaning work is time-consuming; a time period during which the pot may not be employed for cooking.

[0004] EP-A-137 416 discloses a device for cleaning the inner surface of waste containers having an opening and being located along road sides. The device is mounted on a vehicle and comprises a robot which is arranged to lift the container and to rotate the container half a revulotion and onto which a nozzle is mounted and introduceable through an opening of the container. The nozzle is thereby arranged to generate a liquid jet which at a high pressure sweeps over the whole inner surface of the container. No messures seams to have been taken to close the container from the surrounding spaces and thereby prevent the high pressure jet from coming out into the surrounding spaces. It is to be noted that such a high pressure jet is a risk if it is permitted to hit a person.

[0005] DE-A-4 223 451 discloses a device for the supply of liquid to the whole inner surface of a container by means of a nozzle provided in the container.

[0006] SU-A-1630 864 discloses a device for cleaning the inner surface of a bottle-like container by means of a nozzle which is introduceable through an opening into the container and which is arranged to generate a liquid jet which at high pressure sweeps over the whole inner surface of the container.

SUMMARY OF THE INVENTION

[0007] The object of the present invention is to overcome the problems described above and provided a device and a method for the treatment of the inner surface of a container.

[0008] This object is obtained by the device initially defined and
characterized in that the cover comprises at least one drainage passage which extends between the interior of the container and the surrounding spaces. By such a device, pots and similar containers may be cleaned or treated in any other way in a quick and efficient manner. The work effort which is required may be reduced significantly in comparison with manual cleaning. Furthermore, by means of such a cover the fluid supplied may be prevented from coming out into the surrounding space in an uncontrolled manner.This is particularly advantageous in connection with fluid supply under high pressure and/or fluids containing toxic substances, since the fluid in these cases may injure the person or persons operating the device. By means of said sealing surfaces, a proper sealing of the interior of the container is ensured during the treatment process.

[0009] According to an embodiment of the invention, the cover is designed in such a manner, in an area essentially immediately inside the sealing surface of the cover that the velocity of a fluid jet hitting the cover will be reduced in such a way that the fluid is prevented from coming out of the interior of the container. Such a design of the cover is particularly advantageous when the fluid is supplied by means of a high pressure jet which when it hits an essentially plane cover may displace the same from the sealing abutment against the container. Thereby, the cover may comprise a deflection located radially inside the sealing surface of the cover and arranged to form, in cooperation with the sealing surface of the container, an annular space accessible from the interior of the container via an annular gap. Such a space contributes to reduce the force by which a high pressure jet acts on the joint betweent the cover and the container and in such a manner the risk is reduced that the fluid will come out of the container or provide an unwanted leakage. Furthermore, said deflection may advantageously be arranged to form, in cooperation with an upper portion of the inner surface of the container, an annular space tapering towards the gap. Also such an area contributes to reduce the force by which the jet acts on the joint between the cover and the container.

[0010] According to a further embodiment of the invention, the drainage passage comprises a groove, or depression, at the sealing surface of the cover.

[0011] According to a further embodiment of the invention, the treatment member is releaseably mountable in a passage extending through the cover. Since the cover has to be adapted to the size of the container one may by such a releaseably mountable treatment member utilize the latter for a number of different containers of different size. Thereby, the treatment member may comprise a nozzle which is provided on a holder member which is introduceable into said passage. Advantageously the holder member has a sealing surface which is arranged to abut sealingly a sealing surface of said passage when the holder member is introduced therein.

In such a manner, it is ensured that the holder member sealingly closes against the cover. The sealing surface of the holder member and the sealing surface of the passage may be conical.

[0012] According to a further embodiment of the invention, the holder member comprises a shaft on which a motor arranged to rotate the nozzle is provided and which encloses a channel for the supply of said liquid to the nozzle.

[0013] According to a further embodiment of the invention, the nozzle is arranged to generate a liquid jet which at a high pressure sweeps over the essentially whole inner surface of the container. By the sealingly closing cover according to the invention one may in an efficient manner prevent the dangerous high pressure jet from coming out into the surrounding space.

[0014] According to a further embodiment of the invention, at least one attachment member is arranged to engage a flange-like edge of the container in order to attach the cover to the container. The attachment member may advantageously be arranged to extend from the holder member over the cover to the flange-like edge and comprise a flexible element which is attachable to the holder member and comprises a hook-like member which is attachable about the flange-like edge.

[0015] According to a further embodiment of the invention, the cover comprises at least one drainage passage which extends between the interior of the container and the surrounding space. Thereby, the sealing surface of the cover may comprise a groove forming said drainage passage during said closing.

[0016] According to a further embodiment of the invention, there is a suspension device which comprises a carriage being displaceably provided on a rail and arranged to carry the holder member by a suspension element permitting the displacement of the holder member in a vertical direction for the transport of the holder member between different containers to be cleaned.

[0017] The object defined above is also obtained by the method initially defined and characterized by the steps of:

bringing the container to such a position that the opening is located in an essentially vertical plane,
mounting a treatment member in such a position that it extends into the container through said opening, and attaching a cover which is arranged to support the treatment member, to the container in such a manner that it covers the opening, the cover having a sealing surface of the container during said closing, and the cover comprising at least one drainage passage extending between the interior of the container and the surrounding space,
treating the container by the supply of a fluid via the treatment member, and
conveying the fluid supplied out through said drainage passage.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The present invention is now to be explained more closely by means of different embodiments disclosed by way of example and with reference to the drawings attached hereto.

Fig 1 discloses a view from above of a cover of a device according to an embodiment of the invention.
Fig 2 discloses a sectional view of the cover along the line II-II in Fig 1.
Fig 3 discloses a side view of a treatment member of a device according to an embodiment of the invention.
Fig 4 discloses a sectional view of a part of the cover in Fig 1 and attached to an edge of a container.
Fig 5 discloses a perspective view of the device acording to an embodiment of the invention.

DETAILED DESCRIPTION OF DIFFERENT EMBODIMENTS

[0019] Fig 1 and 2 discloses a cover 1 of the device according to the invention. The cover 1 is intended to close an opening of a container 2 (see Fig 5) during cleaning of the interior of the container 2. The cover 1 comprises a passage 3 centrally provided and a curved portion 4 located radially outside and extending about the central passage 3. The curvature is such that the cover 1 projects outwardly from the container 2 to which the cover 1 is intended to be attached. By means of such a curvature, stiffness and torsion stability of the cover 1 are improved. The cover 1 is advantageously manufactured in any light material, such as plastic, for instance polycarbonate. Also metallic materials are possible. In applications for kitchens, it is important that the curved material is such that it may have a high surface finess in order to prevent accumulations of bacteria and other microorganisms from getting a hold at the cover 1. Radially outside the curved portion 4, the cover 1 comprises a deflection 5 which extends around the cover 1. The deflection 5, see Fig 4, comprises a first flange 5a extending upwardly from the upper side of the cover 1 and a second flange 5b extending back. The second flange 5b is shorter than the first flange 5a. Each of the flanges 5a and 5b forms essentially conical surfaces. Radially outside the deflection 5, the cover 1 comprises an essentially plane portion 6 which may be terminated by a flange 7 extending upwardly, i e from the upper side of the cover 1, see Fig 4.

[0020] The cover 1 is arranged to recieve a treatment member 8 in the passage 3, which is disclosed in Fig 3. The treatment member 8 is in the example disclosed a cleaning member 8 which comprises a shaft 9 carrying a nozzle 10. The nozzle 10 and the shaft 9 are provided on a holder member 11 in such a manner that the shaft 9 extends therethrough and carries a motor 12. The

holder member 11 comprises a peripheral conical sealing surface 11a which is arranged to abut a conical sealing surface 3a of the passage 3 when the cleaning memeber 8 is introduced into the cover 1. The nozzle 10 disclosed comprises to nozzle orifices 10a, 10b which are arranged to generate a respective liquid jet under high pressure in such a manner that these will sweep over the whole inner surface of the container 2. This sweeping movement is provided by means of the motor 12 which is arranged to rotate the nozzle 10 about a longitudinal axis of the shaft 9 and about an axis which is perpendicular to the longitudinal axis of the shaft 9. Liquid under high pressure is supplied by a pump member not disclosed via an inlet 13 and a channel 14 extending through the shaft 9. The pressure of the liquid may for instance be between 70 and 130 bars, preferably at least 90 bars. In order to protect the under side of the cover 1, the cleaning member 8 also comprises a protecting shield 15 which is provided on the shaft 9 between the nozzle 10 and the holder member 11. It is to be noted that the shield 15 has a smaller diameter than the holder member 11 in order to enable the introduction of the cleaning member 8 throuhg the passage 3. Furthermore, there is an electronic control unit 16 which is arranged to control different functions of the device disclosed, for instance operation time, supply of chemicals, flushing, liquid pressure, sweep velocity etc.

[0021] In Fig 4, it is disclosed how the plane portion 6 of the cover 1 which has a sealing surface 6a abuts a corresponding plane sealing surface 2a of a container 2. In parallel inside the plane portion 6, the flanges 5a and 5b of the deflection 5 form in cooperation with the sealing surfaces 2a of the container 2 an annular space 17 which is accessible from the interior of the container 2 via an annular gap 18. Furthermore, the flange 5a is arranged to form, in cooperation with an upper portion of the inner surface of the container 2, an annular space 19 tapering towards a gap 18. The purpose of the two annular spaces 17 and 19 is to reduce the force of the high pressure jet when it is directed towards the border area or the joint between the cover 1 and the container 2.

[0022] Furthermore, the cover 1 comprises two drainage passages 20 which extend between the interior of the container 2 and the surrounding space. The drainage passages 20 are designed as a respective groove or depression at the sealing surface 1a of the cover 1. The purpose of the drainage passages 20 is to discharge the water supplied to the interior of the container 2 via the nozzle 10 during cleaning of the container. It is to be noted that the two drainage passages may be replaced by one single such passage.

[0023] The device according to the invention also comprises two attachment members 21 for tightening the cover 1 and the cleaning member 8 onto a container 2. The attachment members 21 disclosed are at their one end attached to a respective attachment 22 which are provided on the upper side of the holder member 11, see Fig 3, and are at their other end fixedly hooked about an upper flange 23 of the container 2, which is directed radially outwardly. The attachement members 21 comprise a flexible element, for instance a line or as in the example disclosed a band, extending between the attachment 22 of the holder member 11 and a hook-like member 24 engaging the flange 23. Furhtermore, the attachment members 21 comprise tightening devices 25 schematically disclosed, for instance of the type excenter tighteners, which are arranged to fixedly tighten the attachment member 21 and at the same time press the cover 1 and the cleaning member 8 against the container 2. As appears from Fig 4, the flexible element 21 abuts the upper portion of the deflection 5. According to an alternative embodiment, the device according to the invention comprises as an attachment member an elastic band or the like which is attached to two diametrically opposite attachment elements of the container 2 and which are provided, by being pulled outwardly, around the cover 1 and the cleaning member 8, i. e. the band maintains the cover 1 as well as the cleaning member 8 in position. Thereby, the band may extend between two rings 31 or the like, see Fig 3, which are provided in parallel on the outwardly facing end surface of the motor 12.

[0024] Fig 5 discloses how the device according to the invention may be utilized in a kitchen having two containers in the form of pots 2. During cleaning of the pots 2, these are tilted in such a manner that the opening of the pots 2 is located in a vertical plane. The cover 1 and the cleaning member 8 according to the invention are suspended in a carriage 26 which may be displaced lateraly on a rail 27. The cleaning member 8 and the cover 1 are suspended in a line 28 and, by means of a balance block or the like (not disclosed), be displaced in a vertical direction. In such a manner, the cover 1 and the cleaning member 8 may be attached in front of the vertical opening of the pot 2 and in an easy manner be tightened to this opening. The carriage 26 also comprises means for guiding a hose 29 for the supply of liquid to the nozzle 10 via the inlet 13. The hose 29 is wound on a hose reel 30. Thereafter, the liquid supply and the cleaning member 8 may be activated by means of the control unit 16. The cover 1 is provided in such a manner that the drainage passages 20 point downwardly so that the liquid supplied may flow out of the pot 2.

[0025] The present invention is not limited to the embodiment disclosed above but may be varied and modified within the scope of the following claims.

[0026] For instance, it is to be noted that the attachment members 21 may be designed in many different ways and comprise bands of fabric, syntetic fiber material or metal sheet. In order to increase the security, it is also possible to provide the device with more than two attachment members 21. It is also possible to provide separate members for the attachment of the cover 1 to the container 2 and for the attachment of the cleaning member 8 to the cover 1. Fig 3 discloses such a sensor in the form of a switch member 32 that is arranged to be

pushed inwardly by means of said attachment band and thereby allow the operation of the motor and the supply of the high pressure jet. When the band is removed the motor operation and the supply of the high pressure jet are interrupted. The switch member 32 is provided between the two parallel rings 31.

[0027] It is also to be noted that the device according to the invention may comprise sensors for sensing that the cleaning member 8 is sealingly provided in the cover 1 and that the cover 1 is sealingly provided on the container 2. These sensors are advantageousely connected to the control unit so that the device may be started only when these sealingly conditions exist.

[0028] As was mentioned above, the device according to the invention may suitably also be provided for other treatment than cleaning of inner surfaces of different types of containers. For instance, it is suitable and advantageous for spray painting or spray finishing, in which case it is also desireble to prevent paint or lacquer from penetrating the surrounding spaces. Another treatment may comprise blasting or the supply of gases for different purposes. In the cases that gas is supplied or formed due to the treatment it may be suitable to design the cover 1 without any drainage passages 20.

Claims

1. A device for the treatment of the inner surface of a container (2) which has an opening, comprising a treatment member (8), which is mountable in such a position that it extends into the container (2) through said opening and arranged to enable said treatment by the supply of a fluid, and a cover (1), which is arranged to close said opening and support the treatment member (8) in said position and has a sealing surface (6a) arranged to abut a sealing surface (2a) of the container (2) during said closing, **characterized in that** the cover (1) comprises at least one drainage passage (20) comprising a groove at the sealing surface (6a) of the cover (1) and extending between the interior of the container (2) and the surrouding space.

2. A device according to claim 1, **characterized in that** the cover (1) is designed in such a manner, in an area (5, 5a, 5b) essentially immediately inside the sealing surface (6a) of the cover (1) that the velocity of a fluid jet hitting the cover will be reduced in such a way that the fluid is prevented from coming out of the interior of the container (2).

3. A device according to claim 2, **characterized in that** the cover (1) comprises a deflection (5, 5a, 5b) located radially inside the sealing surface (1a) of the cover and arranged, in cooperation with the sealing surface (2a) of the container, to form an annular space (17) accessible from the interior of the container (2) via an annular gap (18).

4. A device according to claim 3, **characterized in that** said deflection (5, 5a, 5b) is arranged to form, in cooperation with an upper portion of the inner surface of the container (2), an annular space (19) tapering towards the gap (18).

5. A device according to any one of the preceding claims, **characterized in that** the treatment member (8) is releasably mountable in a passage (3) extending through the cover (1).

6. A device according to claim 5, **characterized in that** the treatment member (8) comprises a nozzle (10) provided on a holder member (11) which is introduceable into said passage (3).

7. A device according to claim 6, **characterized in that** the holder member (11) has a sealing surface (11a) arranged to sealingly abut a sealing surface (3a) of said passage (3) when the holder member (11) is introduced therein. to claim 7, **characterized in that** the

8. A device according to claim 7, **characterized in that** the sealing surface (11a) of the holder member and the sealing surface (3a) of the passage are conical.

9. A device according to any one of claims 6-8, **characterized in that** the holder member (11) comprises a shaft (9) on which a motor, arranged to rotate the nozzle (10), is provided and which encloses a channel (14) for the supply of said liquid to the nozzle (10).

10. A device according to any one of claims 6-9, **characterized in that** the nozzle (10) is arranged to generate a liquid jet which at a high pressure sweeps over the essentially whole inner surface of the container (2).

11. A device according to any one of the preceding claims, **characterized by** at least one attachment member (21) arranged to engage a flange-like edge (23) of the container in order to attach the cover (1) to the container (2).

12. A device according to claim 11, **characterized in that** said attachment member (21) is arranged to extend from the holder member (11, 22) over the cover (1) to the flange-like edge (23).

13. A device according to claim 12, **characterized in that** the attachment member (21) comprises a flexible element which is attachable to the holder member and a hook-like member (24) attachable about

the flange-like edge (23).

14. A device according to any one of the preceding claims, **characterized by** a suspending device comprising a carriage (26) displaceably provided on a rail (27) and arranged to carry the holder member (11) by means of a suspension element (28) permitting the dispacement of the holder member in a vertical direction for the transport of the holder member between different containers (2) to be cleaned.

15. A method of treatment of the inner surface of a container (2) having an opening, **characterized by** the steps of :

bringing the container (2) to such a position that the opening is located in an essentially vertical plane,
mounting a treatment member (8) in such a position that it extends into the container (2) through said opening, and attaching a cover (1) which is arranged to support the treatment member (8) to the container in such a manner that it covers the opening, the cover (1) having a sealing surface (2) of the container (2) during said closing and the cover (1) comprising at least one drainage passage (20), comprising a groove at the sealing surface (6a) of the cover (1) and
extending between the interior of the container (2) and the surrounding space,
treating the container by the supply of a fluid via the treatment member, and
conveying the fluid supplied out through said drainage passage (20).

Patentansprüche

1. Vorrichtung zur Behandlung der inneren Oberfläche eines eine Öffnung aufweisenden Behälters (2), die ein Behandlungsteil, das in einer solchen Lage montierbar ist, dass es sich in den Behälter (2) durch die genannte Öffnung erstreckt und durch seine Anordnung die genannte Behandlung mittels einer Flüssigkeitszufuhr ermöglicht, und einen Deckel (1) aufweist, der zum Verschließen der genannten Öffnung und zur Halterung des Behandlungsteiles (8) in der genannten Lage angebracht ist und der eine Dichtungs-Oberfläche (6a) zur Anlage an eine Dichtungs-Oberfläche (2a) des Behälters (2) während des Verschließens aufweist,
dadurch gekennzeichnet,
dass der Deckel (1) wenigstens einen Ablaufkanal (20) enthält, der eine Nut an der Dichtungs-Oberfläche (6a) des Deckels (1) aufweist und der sich zwischen dem Innenraum des Behälters (2) und dem Umgebungsraum erstreckt.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Deckel in einem Bereich (5, 5a, 5b) im wesentlichen unmittelbar innerhalb der Dichtungs-Oberfläche (6a) des Deckels (1) derart geformt ist, dass die Geschwindigkeit eines Flüssigkeitsstrahls, der den Deckel trifft, in solch einer Weise reduziert wird, dass die Flüssigkeit daran gehindert ist, aus dem Inneren des Behälters herauszukommen.

3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** der Deckel eine radial innerhalb der Dichtungs-Oberfläche (1a) des Deckels angeordnete Krümmung aufweist und in Verbindung mit der Dichtungsoberfläche (2a) des Behälters so angeordnet ist, dass ein ringförmiger Raum (17) gebildet wird, der von dem Inneren des Behälters (2) über einen ringförmigen Spalt (18) zugänglich ist.

4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** die genannte Krümmung (5, 5a, 5b) in Verbindung mit einem oberen Teil der inneren Oberfläche des Behälters (2) zur Ausbildung eines Ringraumes (19) angeordnet ist, der sich in Richtung auf den Spalt (18) verjüngt.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Behandlungsteil (8) lösbar in einer in einem Kanal (3) montiert ist, der sich durch den Deckel (1) erstreckt.

6. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet, dass** das Behandlungsteil (8) eine Düse (10) aufweist, die auf einem Halteteil (11) vorgesehen ist, das in den genannten Kanal (3) einführbar ist.

7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** das Halteteil eine Dichtungs-Oberfläche (11a) besitzt, die zur abdichtenden Anlage an eine Dichtungsoberfläche (3a) des genannten Kanals (3) ausgebildet ist, wenn das Halteteil (3) darin eingeführt wird.

8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet, dass** die Dichtungs-Oberfläche (11a) des Halteteils und die Dichtungs-Oberfläche (3a) des Kanals konisch sind.

9. Vorrichtung nach einem der Ansprüche 6 bis 8, **dadurch gekennzeichnet, dass** das Halteteil (11) einen Schaft (9) aufweist, auf dem ein Motor zum Rotationsantrieb der Düse (10) angeordnet ist und der einen Kanal (14) für die Zufuhr der genannten Flüssigkeit zu der Düse (10) einschließt.

10. Vorrichtung nach einem der Ansprüche 6 bis 9, **da-**

durch gekennzeichnet, dass die Düse (10) zur Erzeugung eines Flüssigkeitsstrahls ausgebildet ist, der unter einem hohen Druck über die im wesentlichen gesamte innere Oberfläche des Behälters (2) hinwegstreicht.

11. Vorrichtung nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch** wenigstens ein Befestigungsglied (21), das zum Eingriff in eine flanschartige Kante (23) des Behälters ausgebildet ist, um den Deckel an dem Behälter (2) zu befestigen.

12. Vorrichtung nach Anspruch 11, **dadurch gekennzeichnet, dass** das Befestigungsglied (21) zur Erstreckung von dem Halteglied (11, 21) über den Behälter bis zur flanschartigen Kante (23) ausgebildet ist.

13. Vorrichtung nach Anspruch 12, **dadurch gekennzeichnet, dass** das Befestigungsglied (21) ein flexibles Element aufweist, das an dem Halteteil und einem hakenförmigen Glied (24) befestigbar ist, das über die flanschartige Kante (23) befestigt werden kann.

14. Vorrichtung nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch** eine Aufhängevorrichtung, die einen Schlitten besitzt, der verschiebbar auf einer Schiene (27) vorgesehen und ausgebildet ist um das Halteteil (11) mittels eines Aufhänge-Elementes (28) zu tragen, das die Verschiebung des Halteteils in einer vertikalen Richtung für den Transport des Halteteils zwischen unterschiedlichen Containern (2) erlaubt, die gereinigt werden.

15. Verfahren zur Behandlung der inneren Oberfläche eines Behälters (2) mit einer Öffnung, **gekennzeichnet durch** die Schritte:

- Anordnung des Behälters (2) in eine solche Position, dass die Öffnung in einer im wesentlichen vertikalen Ebene liegt,
- Montieren eines Behandlungsteils (8) in eine solche Position, dass es in den Behälter (2) **durch** dessen Öffnung ragt, und
- Befestigung eines Deckels (1), der angeordnet ist, um das Behandlungsteil (8) zu dem Behälter derart zu tragen, dass er die Öffnung verschließt, wobei der Dekkel eine Dichtungs-Oberfläche (2) des Behälters (2) während des Verschlusses aufweist und der Deckel (1) wenigstens einen Ablaufkanal (20) aufweist, der eine Nut an der Abdichtungs-Oberfläche (6a) des Deckels besitzt und der sich zwischen dem Innenraum des Behälters (20) und dem Umgebungsraum erstreckt,
- Behandlung des Behälters mittels einer Flüssigkeitszufuhr über das Behandlungsteil und Herausbefördern der zugeführten Flüssigkeit **durch** den genannten Ablaufkanal.

Revendications

1. Dispositif pour le traitement de la surface intérieure d'un récipient (2) qui possède une ouverture, comprenant un élément de traitement (8) pouvant être monté dans une telle position qu'il s'étend dans le récipient (2) à travers ladite ouverture et agencé pour permettre ledit traitement par l'introduction d'un fluide, et un couvercle (1), qui est agencé pour fermer ladite ouverture et supporter l'élément de traitement (8) dans ladite position et possède une surface d'étanchéité (6a) agencée pour buter contre une surface d'étanchéité (2a) du récipient (2) pendant ladite fermeture, **caractérisé en ce que** le couvercle (1) comprend au moins un passage de vidange (20) comprenant une rainure au niveau de la surface d'étanchéité (6a) du couvercle (1) et s'étendant entre l'intérieur du récipient (2) et l'espace environnant.

2. Dispositif selon la revendication 1, **caractérisé ce que** le couvercle (1) est conçu de telle manière, dans une zone (5, 5a, 5b) essentiellement immédiatement à l'intérieur de la surface d'étanchéité (6a) du couvercle (1), que la vélocité d'un jet de fluide frappant le couvercle soit réduite de façon à ce que le fluide soit empêché de sortir de l'intérieur du récipient (2).

3. Dispositif selon la revendication 2, **caractérisé en ce que** le couvercle (1) comprend une déviation (5, 5a, 5b) située radialement à l'intérieur de la surface d'étanchéité (1a) du couvercle et agencée, en coopération avec la surface d'étanchéité (2a) du récipient, pour former un espace annulaire (17) accessible depuis l'intérieur du récipient (2) par l'intermédiaire d'un écartement annulaire (18).

4. Dispositif selon la revendication 3, **caractérisé en ce que** ladite déviation (5, 5a, 5b) est agencée pour former, en coopération avec une partie supérieure de la surface intérieure du récipient (2), un espace annulaire (19) s'effilant vers l'écartement (18).

5. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de traitement (8) peut être monté de manière libérable dans un passage (3) s'étendant à travers le couvercle (1).

6. Dispositif selon la revendication 5, **caractérisé en ce que** l'élément de traitement (8) comprend une

buse (10) proposée sur un élément formant support (11) qui peut être introduit dans ledit passage (3).

7. Dispositif selon la revendication 6, **caractérisé en ce que** l'élément formant support (11) possède une surface d'étanchéité (11a) agencée pour buter de manière étanche contre une surface d'étanchéité (3a) dudit passage (3) quand l'élément formant support (11) est introduit à l'intérieur de celui-ci.

8. Dispositif selon la revendication 7, **caractérisé en ce que** la surface d'étanchéité (11a) de l'élément formant support et la surface d'étanchéité (3a) du passage sont coniques.

9. Dispositif selon l'une quelconque des revendications 6 à 8, **caractérisé en ce que** l'élément formant support (11) comprend un arbre (9) sur lequel un moteur, agencé pour faire pivoter la buse (10), est proposé et qui enferme un canal (14) pour l'introduction dudit liquide vers la buse (10).

10. Dispositif selon l'une quelconque des revendications 6 à 9, **caractérisé en ce que** la buse (10) est agencée pour générer un jet liquide qui à haute pression balaye essentiellement l'intégralité de la surface intérieure du récipient (2).

11. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins un élément de fixation (21) est agencé pour mettre en prise une arête en forme de bord (23) du récipient afin d'attacher le couvercle (1) au récipient (2).

12. Dispositif selon la revendication 11, **caractérisé en ce que** ledit élément de fixation (21) est agencé pour s'étendre depuis l'élément formant support (11, 22) sur le couvercle (1) vers l'arête en forme de bord (23).

13. Dispositif selon la revendication 12, **caractérisé en ce que** ledit élément de fixation (21) comprend un élément flexible qui peut être fixé à l'élément formant support et un élément en forme de crochet (24) qui peut être fixé autour de l'arête en forme de bord (23).

14. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé par** un dispositif de suspension comprenant un chariot (26), proposé de manière déplaçable sur un rail (27) et agencé pour acheminer l'élément formant support (11) au moyen d'un élément de suspension (28) permettant le déplacement de l'élément formant support verticalement pour le transport de l'élément formant support entre les différents récipients (2) à nettoyer.

15. Procédé de traitement de la surface intérieure d'un récipient (2) possédant une ouverture, **caractérisé par** les étapes consistant à :

apporter le récipient (2) dans une telle position que l'ouverture est située dans un plan essentiellement vertical,
monter un élément de traitement (8) dans une telle position qu'il s'étend à l'intérieur du récipient (2) à travers ladite ouverture, et attacher un couvercle (1) qui est agencé pour supporter l'élément de traitement (8) sur le récipient de telle manière à ce qu'il couvre l'ouverture, le couvercle (1) possédant une surface d'étanchéité (2) du récipient (2) pendant ladite fermeture et le couvercle (1) comprenant au moins un passage de vidange (20) comprenant une rainure au niveau de la surface d'étanchéité (6a) du couvercle (1) et s'étendant entre l'intérieur du récipient (2) et l'espace environnant,
traiter le récipient par l'introduction d'un fluide par l'intermédiaire de l'élément de traitement, et transporter vers l'extérieur le fluide introduit à travers ledit passage de vidange (20).

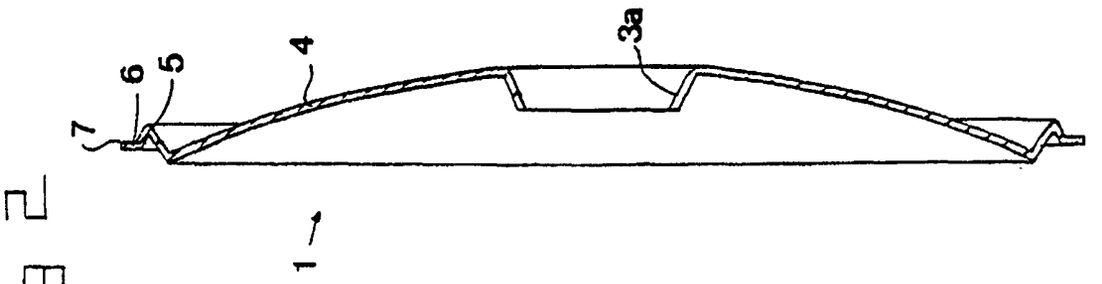

Fig 2

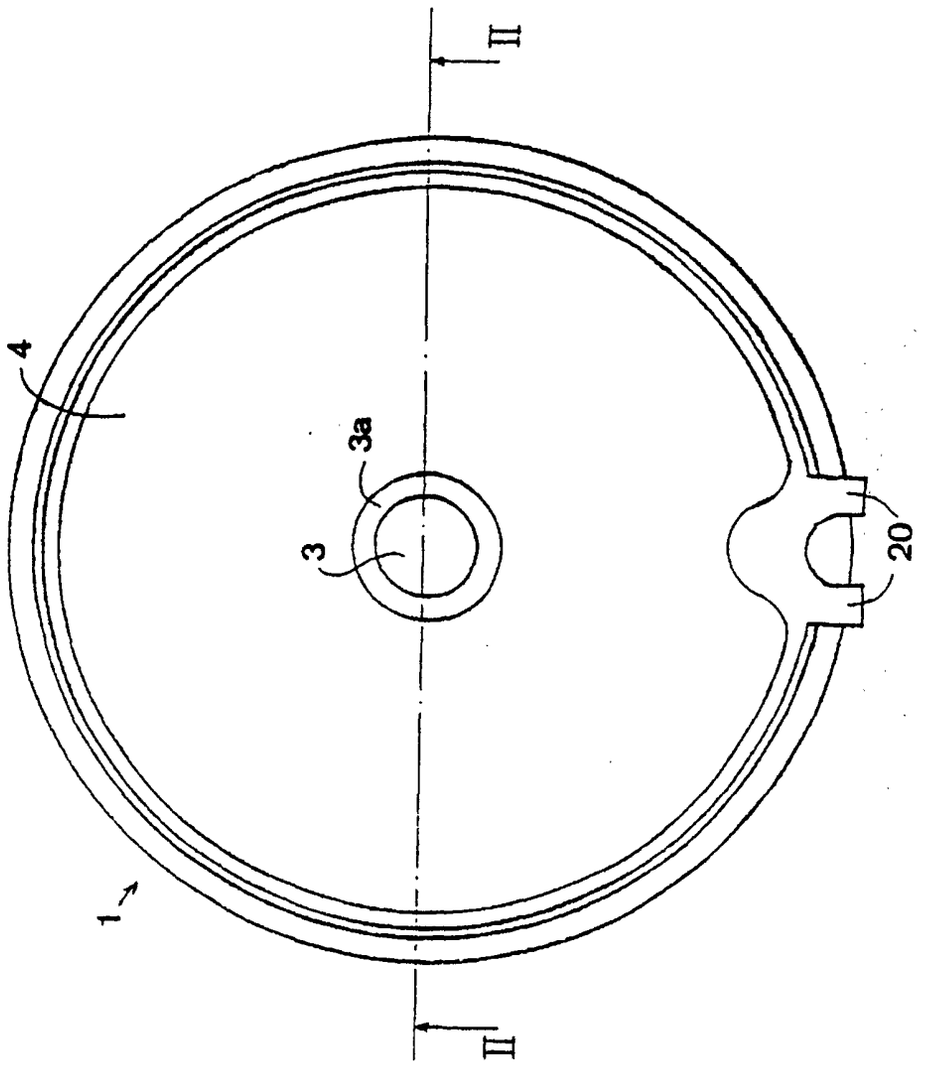

Fig 1

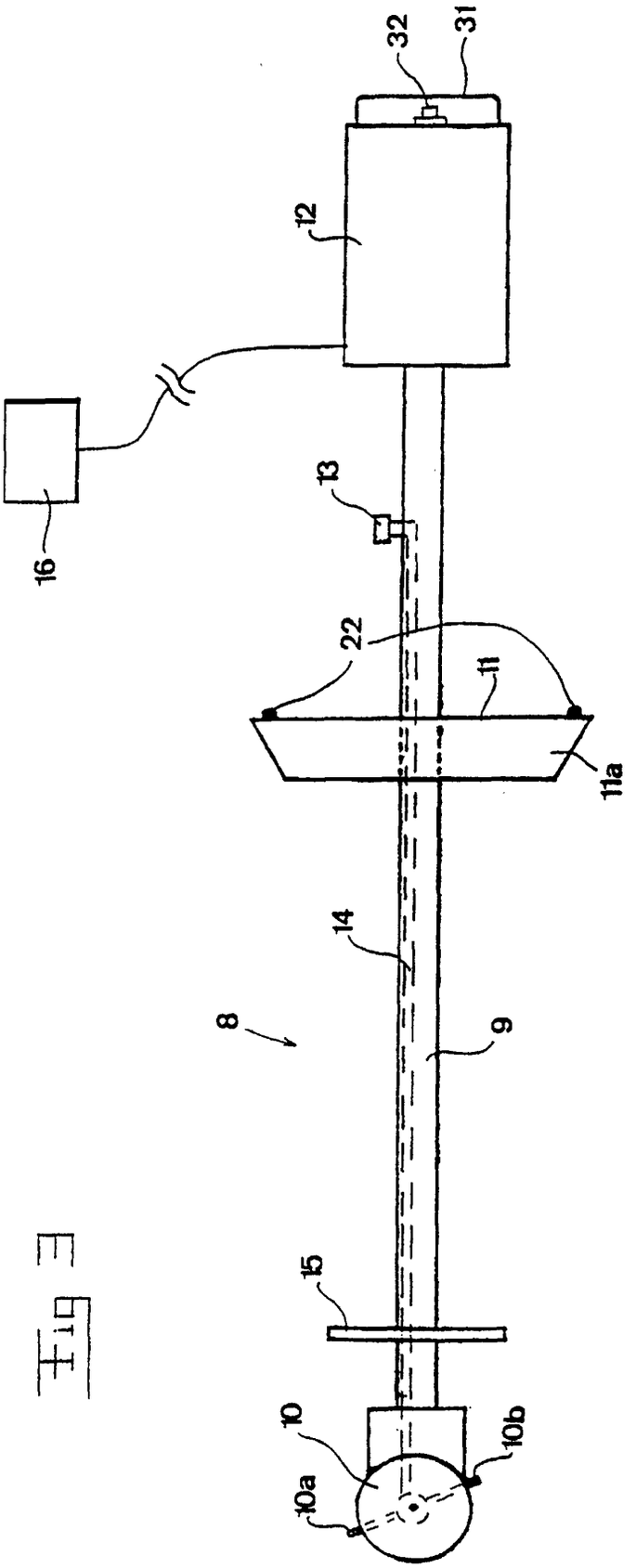

Fig. 3

Fig 4

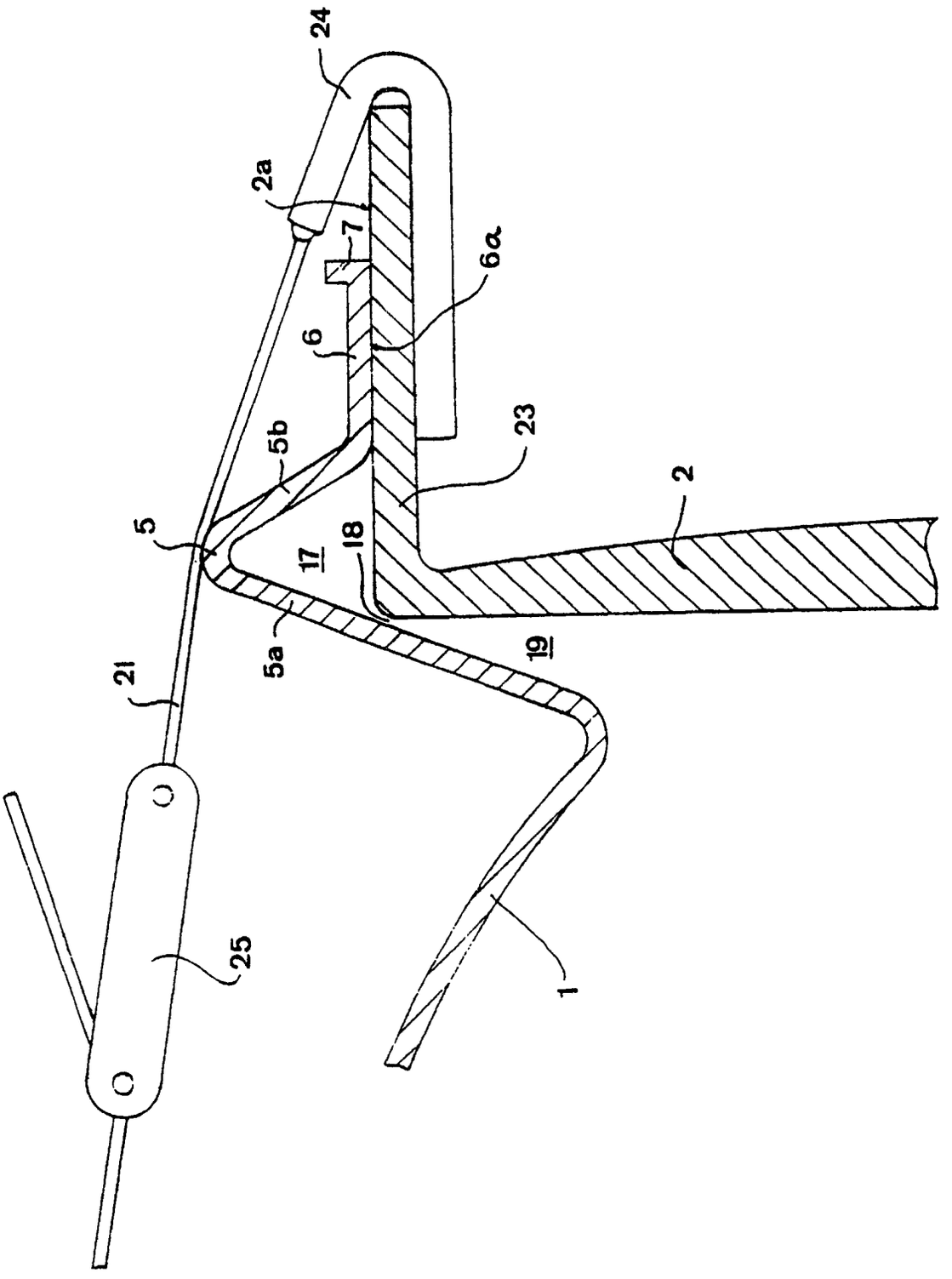

Fig 5