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(54) CAN WASHER AND METHOD

DOSENREINIGUNGSVORRICHTUNG UND VERFAHREN

APPAREIL ET MÉTHODE DE NETTOYAGE DE BOÎTE

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(73) Proprietor: **Greenbank Technology Limited
Blackburn, Lancashire BB1 5PG (GB)**

(72) Inventor: **FAULKNER, Christopher James
Blackburn
Lancashire BB1 3AB (GB)**

(74) Representative: **Appleyard Lees IP LLP
15 Clare Road
Halifax HX1 2HY (GB)**

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Description

FIELD

[0001] The present disclosure relates in general to a can washer and a method.

BACKGROUND

[0002] Production of cans, such as beverage cans or food cans, typically involves a step wherein newly formed cans are passed through a can washer. In the can washer the cans are cleaned to remove contaminants, for example residue from earlier manufacturing steps, and additional surface treatments may be applied, for example in preparation of subsequent manufacturing steps.

[0003] For such purposes, the cans are exposed to a succession of spray curtains of wash liquid generated by sequentially placed nozzle arrays. Re-configurability of the spray curtains is highly desirable as the spray curtains are carefully arranged to optimise efficacy of the can washer dependent on the size and shape of the cans. Where production is changed to a different size or shape of cans, the spray curtains may need to be adapted for optimised operation.

[0004] Adapting the spray curtains, however, may be a cumbersome and time-consuming process due to the size and weight of the supply risers on which the nozzle arrays are carried in certain conventional can washers. In particular, access to the supply risers may be provided from one side of the can washer, while the supply risers are connected and secured on the other side of the can washer.

[0005] Therefore, it is now desired to provide a can washer as an alternative to previously available designs. The example embodiments have been provided with a view to addressing at least some of the difficulties that are encountered with current can washers whether those difficulties have been specifically mentioned above or will otherwise be appreciated from the discussion herein. DE507274C and EP1122338A2 describe examples of the related art.

SUMMARY

[0006] It is an object of the present invention to overcome at least one of the above or other disadvantages. According to the present invention there is provided an apparatus and method as set forth in the appended claims. It is an aim of the present invention to provide a can washer which is easily adaptable to cans of various sizes or shapes. It is a further aim to provide a can washer which may be convenient for maintenance and repair. It is yet another aim to provide a can washer which may generate improved spray curtains.

[0007] A can washer according to the present disclosure is easily adaptable to modify a spray curtain generated by the can washer. Suitably, a spray bar arranged

to generate the spray curtain is easily replaceable as it is carried by a guide to improve insertion into and removal from the can washer.

[0008] The guide may be a support structure taking any suitable form. In some examples, the guide forms a sleeve which retains the spray inside. In other examples, the guide forms a number of support beams on which the spray bar is carried.

[0009] Conveniently, the guide extends towards an access side of the can washer from which the spray bar is inserted or removed. With the guide extending toward the access side, insertion or removal of the spray bar into the can washer may amount to insertion or removal of the spray bar into the guide. As the guide extends towards the access side to receive or release the spray bar closer to the access side, the guide may improve insertion and removal of the spray bar and, thus, improve adaptability of the generated spray curtain.

[0010] Accordingly, there is provided an exemplary embodiment of a can washer for treatment of cans.

[0011] The can washer comprises a conveyor belt arranged to transport cans through the can washer. The can washer comprises a housing of elongate shape wherein the conveyor is arranged centrally, operating along a longitudinal direction of the can washer. The can washer has a supply side and, located opposite thereto, an access side. In some examples, the can washer has a substantially cuboid shape having opposing elongate sides, where the supply and access side correspond to the elongate sides. A removable access panel is located on the access side for opening the housing.

[0012] The can washer comprises a supply manifold. In use, the supply manifold holds wash liquid from which a spray curtain is generated. Suitably, the supply manifold is provided on the supply side.

[0013] The can washer comprises a supply port. Suitably, the supply port is in flow communication with the supply manifold. Conveniently, the supply port is located on the supply side.

[0014] The can washer comprises a spray bar. Suitably, the spray bar is arranged to generate a spray curtain across a longitudinal direction of the can washer along which cans are transported. Conveniently, the spray bar comprises an inlet portion arranged for connection with the supply port.

[0015] The can washer comprises a guide. Suitably, the guide is arranged to receive and carry the spray bar upon insertion of the spray bar through the access side.

[0016] The guide extends from the supply side at least halfway towards the access side. Suitably, the guide has an elongate shape. In some examples, the guide extends 75% to the access side. In other examples, the guide extends 85% to the access side. In yet further examples, the guide extends substantially all the way to the access side.

[0017] In some examples, the guide is configured to receive the spray bar and guide the spray bar into connection with the supply port of the supply manifold.

[0018] The can washer may be convenient to access in order to, for example, perform maintenance or repair work. Suitably, in some examples there is provided a guide which is readily detachable from the can washer. Conveniently, with both the spray bar and the guide being removable, access to an interior of the can washer may be improved.

[0019] In some examples, the guide is removable from the can washer. Conveniently, any suitable fastening mechanism may be used to secure the guide inside the can washer.

[0020] In some examples, the guide is arranged to secure to the supply port. Conveniently, the guide has a docking end which is arranged to fit around the supply port. Suitably, the guide is configurable to secure the guide and the supply port relative to each other.

[0021] In some examples, the docking end of the guide and the supply port are configurable to couple using a bayonet fastening mechanism. Suitably, pins may be provided on the supply port and slots may be provided on the docking end. Conveniently, the pins are receivable by the slots and locatable in recesses of the slots in order to secure the guide to the supply port.

[0022] In some examples, the can washer comprises a support member for supporting the guide. The guide as well as the spray bar may have a substantial weight and, accordingly, the support member may reduce any strain exerted under a gravitational pull.

[0023] In some examples, the support member comprises a bracket which may be configured to retain the guide.

[0024] In some examples, the spray bar comprises a sleeve. The sleeve is arranged to receive and carry the spray bar. Suitably, the spray bar forms a passage into which the spray bar may be received.

[0025] In some examples, the spray bar comprises an outlet configured to discharge wash liquid.

[0026] In some examples, the outlet is configured to receive a spray nozzle.

[0027] In some examples, the spray bar is substantially cylindrical. Suitably, the spray bar defines a radial direction. Suitably, the spray bar defines a longitudinal direction. The radial direction and the longitudinal direction may be substantially orthogonal.

[0028] In some examples, the outlet is arranged to point into the radial direction of the spray bar.

[0029] In some examples, the spray nozzle, when fitted to the outlet, is arranged to spray into the radial direction.

[0030] In some examples, the spray bar comprises a plurality of outlets arranged in a row. Suitably, the slot is arranged to receive the plurality of outlets. In use, the plurality of rows sequentially fit into the slot as the spray bar is inserted into the guide.

[0031] In some examples, the slot is substantially U-shaped.

[0032] Conveniently, the slot may ensure correct alignment of the spray curtain when the spray bar is inserted.

[0033] The can washer may be suitable for generating

spray curtains which are improved over certain conventional can washers. According to arrangements found in the conventional can washers, a single spray bar would be arranged to generate a pair of spray curtains. Feeding wash liquid through a single spray bar into two spray curtains, however, may lead to a pressure differential across the spray bar. Accordingly, a pair of non-uniform spray curtains may be generated and, hence, efficacy may be adversely affected. Such an arrangement is nevertheless used in order to increase the number of spray curtains per unit length, because a compact spacing of the spray bars themselves is not possible. This is due to the size of clamping mechanisms conventionally used to secure each spray bar. In particular, use of over centre clamps may require relatively large spacing between individual spray bars. By contrast, carrying a spray bar inside a guide may enable a more compact spacing of adjacent spray bars because no large clamping mechanism is required. Accordingly, a spray bar may be arranged to generate a single spray curtain only.

[0034] The can washer is for treatment of cans. Suitably, the spray bar is configured for generating a spray curtain. In some examples, the spray bar is configured to generate a single spray curtain.

[0035] In some examples, the spray bar comprises one outlet for discharging wash liquid while, in other examples, multiple outlets. Conveniently, each outlet may be fitted with a spray nozzle for generating a specific spray curtain. Where the spray bar is arranged to generate a single spray curtain, suitably, the spray bar has a single row of outlets.

[0036] Following its insertion into the can washer, the spray bar may be secured in position. Suitably, in some examples the can washer comprises a locking mechanism which may engage the inserted spray bar in order to secure it in place.

[0037] In some examples, the locking mechanism is located on the access side of the can washer. Such an arrangement may be desirable as the spray bar is inserted from the access side and, hence, the locking mechanism may be engaged without delay.

[0038] In some examples, the locking mechanism is arranged to engage a cap end of the spray bar. The cap end of the spray bar, suitably, is the end opposite the inlet end. Conveniently, the locking mechanism may be engageable to secure the spray bar in position once fully inserted.

[0039] In some examples, the locking mechanism comprises a disengageable bracket which is configurable to retain the spray bar.

[0040] It will be appreciated that a plurality of spray bars would typically be provided on each washer. A plurality of upper spray bars may be provided. The upper spray bars direct fluid from above a transport mat moving the cans through the washer. Additionally or alternatively, a plurality of lower spray bars direct fluid from below and through the transport mat.

[0041] According to another example, there is provided

a method of changing a spray bar configuration.

[0042] The method comprises providing a can washer having a supply side and, opposite thereto, an access side.

[0043] The method comprises accessing the can washer at the access side.

[0044] The method comprises disengaging a locking mechanism provided on the access side and arranged to engage a capped end of the spray.

[0045] The method comprises pulling the spray bar from the can washer. This step comprises disconnecting the spray bar from the supply port located on the supply side and in flow communication with the supply manifold. This step further comprises removing the spray bar from the guide arranged to carry the spray bar, wherein the guide extends from the supply port at least halfway towards the access side.

[0046] Advantageously, replacement of the spray bar with a spray bar having a different configuration is improved. For instance, when processing cans of different sizes, spray bars having optimal nozzle pitch can be easily swapped between production runs. The washer can be provided with further process controls to optimise the spray generated by the spray bar. For instance, fluid characteristics and flow rate through the spray bar can be controlled. In particular, the spray bar may connect to a manifold exit or valve and the manifold may include a damper to control the fluid flow through said aperture or valve.

[0047] Although the improvements have been described in relation to a can washer, it will be appreciated that the easy replacement of spray bars may be applicable to other machines in the can production process where spray bars are used. Therefore the exemplary embodiments may apply to can production machines having a spray bar as explained in relation to a can washer having the spray bar.

BRIEF DESCRIPTION OF DRAWINGS

[0048] For a better understanding of the invention, and to show how example embodiments may be carried into effect, reference will now be made to the accompanying drawings in which:

Fig. 1 shows a perspective view of a can washer;

Fig. 2 shows a perspective view of an interior portion of a can washer;

Fig. 3 shows a perspective view of an interior portion of a can washer where a spray bar is removed;

Fig. 4 shows a perspective view of a portion of an interior of a can washer where a guide is removed, and

Fig 5 shows a schematic perspective view of a can

washer having upper and lower spray bars.

DESCRIPTION OF EMBODIMENTS

[0049] At least some of the following example embodiments provide an improved can washer. The example can washer has a spray curtain configuration which is quickly and easily adapted. At least some examples may provide ease of access to an interior of the can washer for purposes such as maintenance and repair. At least some examples may provide generation of improved spray curtains. Many other advantages and improvements will be discussed in more detail herein.

[0050] Fig. 1 shows a perspective view of a can washer 100 for treating newly-formed cans through application of wash liquid.

[0051] The can washer 100 is fitted with means for carrying cans through the can washer. In this example, the can washer comprises a conveyor belt arranged to transport cans through the can washer. In this example, the can washer 100 has a housing of elongate shape and the conveyor belt is arranged centrally, operating along a longitudinal direction of the can washer. The cans may be inserted at a front end of the can washer for treatment and retrieved from a rear end of the can washer.

[0052] A first side of the can washer 100 corresponds to a supply side 110. In this example, the supply side is a first lateral side of the can washer. The supply side is devoted primarily to storage and distribution of wash liquid.

[0053] A second side of the can washer 100 corresponds to an access side 120. In this example, the access side is a second lateral side of the can washer and is located opposite of the first lateral side. Suitably, the access side enables access to an interior of the can washer. In this example, a removable access panel 121 is located on the access side for opening the housing.

[0054] Fig. 2 shows a perspective view of a portion of an interior of the can washer 100.

[0055] The can washer 100 is suitable for generating spray curtains of wash liquid. Suitably, a supply manifold 130 is provided on the supply side. The supply manifold, or manifold, holds the wash liquid and supplies the wash liquid for treatment of the cans. In some examples, a plurality of supply manifolds is provided.

[0056] In some examples, the supply manifold 130 is filled with wash liquid from the access side 120. Suitably, a supply pipe is provided through which wash liquid may be transported from the access side to the supply side 110. In this example, the supply manifold is arranged to be filled from the supply side. Accordingly, a supply pipe need not be provided, thus resulting in a simplified piping network.

[0057] In some examples, wash liquid is sprayed onto cans being passed through from above as well as from below. In other examples, the can washer 100 is arranged to spray wash liquid only from above or below. In this example, the can washer 100 is arranged to spray wash

liquid from above only. Suitably, a spray bar 140 for generating a spray curtain extends across the conveyor belt at a suitable elevation above the conveyor belt. Conveniently, the spray bar 140 is carried by a guide 150 extending across the conveyor belt on which the cans are passed through the can washer 100.

[0058] The spray bar 140 is configured to generate a spray curtain. Suitably, the spray bar is in flow communication with the supply manifold 130 during operation of the can washer 100. That is to say, wash liquid is fed from the supply manifold to the spray bar so that a spray curtain may be produced.

[0059] In this example, the spray bar 140 has a plurality of outlets 142 for discharging wash liquid. Suitably, the outlets are arranged to discharge wash liquid into the direction of the conveyor belt. In this example, the outlets are arranged to point into a generally downwards direction and, accordingly, discharge wash liquid into the downwards direction.

[0060] Conveniently, an outlet 142 may be fitted with a nozzle. Nozzles fitted to the plurality of outlets 142 may be arranged to generate an improved spray curtain. The improved spray curtain may be such that the cans are exposed to wash liquid for an effective treatment. Accordingly, the nozzles may be chosen dependent on the particular cans being treated, for example the size or shape of the cans.

[0061] When fitted to the outlets 142, the nozzles are arranged to spray the wash liquid into the downwards direction. Thus a spray curtain may be generated through which the cans are passed by the conveyor belt.

[0062] Fig. 3 shows a perspective view of a portion of an interior of the can washer 100 where the spray bar 140 is removed from the guide 150. For illustration purposes the spray bar is also shown in Fig. 3.

[0063] The exemplary can washer 100 is easily adaptable to modify a spray curtain generated by the can washer. Suitably, the can washer is configured for convenient removal and insertion of the spray bar 140.

[0064] In this example, the spray bar 140 may be removed from the guide 150 through an open end 152, or receiving end 152, of the guide. That is, the open end forms an opening. Conveniently, the open end is located in the vicinity of the access side 120. Suitably, the spray bar may be pulled from the open end of the guide in order to remove the spray bar from the can washer. Accordingly, the spray bar may be easily removable from the access side.

[0065] The guide 150 supports the spray bar at the open end 152 throughout the removal of the spray bar 140 from the can washer 100. Ease of removal may thus be provided, even where the spray bar has a relatively high weight and substantial length. Conveniently, the spray bar may be removed manually.

[0066] In this example, the guide 150 forms a sleeve 154 defining a passage 156. Suitably, the spray bar 140 is carried inside the passage. Conveniently, the spray bar is removable from the passage by pulling the spray

bar from the passage.

[0067] In this example, the spray bar 140 has a substantially cylindrical shape. Suitably, the sleeve 154 defines a corresponding passage 156 arranged to receive the spray bar. In other examples, the spray bar has a different shape and the sleeve defines a corresponding passage.

[0068] Following removal, the spray bar 140 may be re-inserted or, as the case may be, a different spray bar 140 inserted. Suitably, the spray bar 140 may be pushed from the access side 120 for insertion of the spray bar. Conveniently, the spray bar may be inserted manually.

[0069] In this example, the open end 152 of the guide 150 extends to the access side 120. Conveniently, the open end may therefore receive and support the spray bar as it is being inserted. Insertion of the spray bar 140, therefore, may be improved.

[0070] Thus ease and convenience may be improved for adapting a spray bar configuration of the can washer 100.

[0071] When fully inserted the spray bar 140 is in flow communication with the supply manifold 130. Suitably, in this example the guide 150 extends from the supply manifold and is arranged to guide the spray bar to the supply manifold during insertion.

[0072] A supply port 132 is provided to receive the spray bar 140 and to feed, in use, wash liquid to the spray bar. In this example, the supply port 132 is provided on the supply manifold 130. In other examples the supply port may be provided separately and connected to the supply manifold through a suitable piping network.

[0073] Conveniently, the guide 150 is arranged to guide the spray bar 140 to the supply port 132 of the supply manifold 130 during insertion. Suitably, the spray bar 140 has an inlet end 144 for connection to the supply port and provides an inlet for wash liquid.

[0074] When fully-inserted, the inlet end 144 and the supply port 132 may connect through a male-female coupling. In this example, the inlet end of the spray bar 140 is configured to fit into the supply port 132. Conveniently, a suitable seal is engaged when the inlet portion is inserted into the supply port. For example, an O-ring arrangement may be provided such that an O-ring seals a gap formed between the inlet end and the supply port and through which wash liquid could escape during use.

[0075] In some examples, a locking member is provided to secure the spray bar 140. Suitably, the locking member may be engaged so that a fully-inserted spray bar remains inserted.

[0076] In some examples, the locking member comprises a bracket which may be engaged to secure the spray bar. Suitably, the bracket may engage a cap end 146 of the spray bar.

[0077] In some examples, the spray bar 140 has outlets 142 and/or nozzles which extend from a main body of the spray bar. In this example, the outlets 142 extend along a radial direction of the substantially cylindrical spray bar. Suitably, the guide 150 forms a slot 158

through which the outlets 142 may extend.

[0078] Suitably, the slot 158 extends from the open end 152 so that when the spray bar 140 is being inserted into the passage 156, the slot receives the outlets 142. Conveniently, correct alignment of the outlets may thus be ensured.

[0079] In this example, the outlets 142 are arranged in a row or on a substantially straight line. Suitably, the slot 158 is substantially straight so that the outlets may be received.

[0080] Fig. 4 shows a perspective view of a portion of an interior of the can washer 100 where the guide 150 is removed. For illustration purposes the guide is also shown in Fig. 4.

[0081] An interior of the exemplary can washer 100 is convenient to access in order to, for example, perform maintenance or repair work. Suitably, the guide 150 is removable from the can washer. Thereby the space occupied by the guide may be freed up and access to the interior of the can washer may thus be improved.

[0082] In this example, the guide 150 is removable. Suitably, the guide comprises a docking end 159 which is arranged to detachably couple to the supply port 132. Any suitable mechanism for coupling the guide and the supply port may be used. In this example, a bayonet fastening mechanism is used.

[0083] In this example, the docking end 159 of the guide 150 fits around the supply port 132. Conveniently, a pair of pins is provided on the supply port while a corresponding pair of slots is provided on the docking end. The pair of pins and the pair of slots, suitably, form a bayonet fastening mechanism. That is, the guide and the port are configurable so that the pins are received in the slots and retained therein.

[0084] In some examples, the can washer 100 comprises a support member arranged to support the guide 150. In this example, a support member may be provided to support the guide in addition to the supply port 132, where one end of the guide is supported, in order to reduce strain on the supply port. Suitably, the support member may be provided towards the other end of the guide. That is, the support member may engage the guide in the vicinity of the open end 152.

[0085] In some examples, the support member comprises a bracket which is configurable to engage and retain the guide.

[0086] In an exemplary embodiment, as shown in Figure 5, the can washer includes an upper spray bar 150u and a lower spray bar 150l. Both spray bars are suitably in accordance with the spray bar as herein described. The upper spray bar 150u directs fluid from above the mat transporting the cans. The lower spray bar 150l directs fluid from below and through the mat transporting the cans.

[0087] In further exemplary embodiments it is envisaged providing the manifold 130 with a control damper. Here, the control damper is operable to control the fluid supplied to the spray bar 150. Any suitable damping

method may be employed to control the fluid flow. For instance the damper may control an exit aperture to the spray bar by increasing or decreasing the aperture size in order to increase and decrease the flow rate of fluid into the spray bar and / or the pressure of the fluid entering the spray bar. For instance a stopper is arranged in the manifold and supported on a shaft that extends through the manifold to be operable by a user. The shaft is suitably sealed. Movement of the shaft controls the stopper to move towards or away from the exit to control the fluid flow there through.

[0088] According to one example, there is provided a method of changing a spray bar configuration of a can washer. The method comprises providing a can washer having a supply side and, opposite thereto, an access side.

[0089] The method further comprises accessing the can washer at the access side.

[0090] The method further comprises disengaging a locking mechanism provided on the access side and arranged to engage a cap end of the spray bar.

[0091] The method further comprises a step of pulling the spray bar from the can washer. This step includes disconnecting the spray bar from a supply port located on the supply side and in flow communication with a supply manifold. This step further includes removing the spray bar from a guide arranged to carry the spray bar, wherein the guide extends from the supply port at least halfway towards the access side.

[0092] In summary, exemplary embodiments of a can washer have been described. The described exemplary embodiments provide for a can washer with improved re-configurability of a spray bar configuration. Additionally, the described exemplary embodiments provide convenient access for maintenance and repair.

[0093] The can washer may be manufactured industrially. An industrial application of the example embodiments will be clear from the discussion herein.

[0094] Although preferred embodiment(s) of the present invention have been shown and described, it will be appreciated by those skilled in the art that changes may be made without departing from the scope of the invention as defined in the claims.

Claims

1. A can washer (100) for treatment of cans, the can washer comprising:

- a conveyor belt arranged to transport cans through said can washer (100);
- a housing of elongate shape wherein the conveyor belt is arranged centrally, operating along a longitudinal direction of said can washer (100), wherein
- a first side corresponds to a supply side (110), the supply side (110) being a first lateral side of

- said can washer;
a second side corresponding to an access side (120), the access side (120) being a second lateral side of said can washer and being located opposite of the first lateral side; wherein a removable access panel (121) is located on said access side (120) for opening the housing;
a supply manifold (130) located on the supply side (110);
a supply port (132) in flow communication with the supply manifold (130); and
a spray bar (140) arranged to generate a spray curtain across a longitudinal direction of the can washer (100) along which cans are transported, wherein
the spray bar (140) comprises an inlet end (144) arranged for connection with the supply port (132); and
a guide (150) extending from the supply port (132) at least halfway towards the access side (120),
the guide (150) being arranged to receive and carry the spray bar (140) upon insertion of the spray bar (140) through the access side (120).
2. The can washer of claim 1, wherein the spray bar (140) comprises a plurality of outlets (142) arranged in a row and the guide (150) forms a slot (158), the slot (158) being arranged to receive the plurality of outlets (142) when the spray bar (140) is carried by the guide (150).
 3. The can washer according to claim 1, wherein the guide (150) comprises a docking end (159) which is arranged to fit around the supply port (132) wherein the guide (150) is arranged to detachably couple to the supply port (132).
 4. The can washer according to claim 3, wherein the docking end (159) of the guide (150) and the supply port (132) are configurable to couple using a bayonet fastening mechanism.
 5. The can washer according to any previous claim,
the can washer comprising a support member, wherein the support member is arranged to engage and support the guide (150) against a gravitational pull.
 6. The can washer according to any previous claim, wherein
the guide (150) comprises a sleeve (154) forming a passage (156) and is arranged to receive the spray bar (140) into the passage (156) and carry the spray bar (140) therein.
 7. The can washer according to any of claims 1 or 3 to
 - 6, wherein
the spray bar (140) comprises an outlet (142) configured to discharge wash liquid.
 8. The can washer according to claim 7, wherein the outlet (142) is configured to receive a spray nozzle.
 9. The can washer according to claim 8, wherein
the spray bar (140) is substantially cylindrical; the outlet (142) is arranged to point into a radial direction of the spray bar (140); and the spray nozzle, when received by the outlet (142), is arranged to spray into the radial direction.
 10. The can washer according to any one of claims 7-9, wherein
the guide (150) forms a slot (158) arranged to receive the outlet (142) when the spray bar (140) is carried by the guide (150).
 11. The can washer according to claim 2, wherein the spray bar (140) has a single row of outlets (142).
 12. The can washer according to any previous claim,
further comprising a locking mechanism on the access side (120);
the locking mechanism being arranged to engage a cap end (146) of the spray bar (140) in order to secure the spray bar (140) to the supply port (132).
 13. The can washer according to claim 12, wherein the locking mechanism comprises a bracket configurable to retain the spray bar (140) and configurable to disengage the spray bar (140).
 14. A method of changing a spray bar (140) configuration, the method comprising:
providing a can washer (100) according to any of claims 12 to 13;
accessing the can washer (100) at the access side (120);
disengaging a locking mechanism provided on the access side (120) and arranged to secure a spray bar (140);
pulling the spray bar (140) from the can washer (100), thereby
disconnecting the spray bar (140) from a supply port (132) located on the supply side (110) and in flow communication with a supply manifold (130), and
removing the spray bar (140) from a guide

(150) arranged to carry the spray bar (140);
wherein the guide (150) extends from the supply port (132) at least halfway towards the access side (120).

Patentansprüche

1. Dosenreinigungsvorrichtung (100) zur Behandlung von Dosen, wobei die Dosenreinigungsvorrichtung Folgendes umfasst:

ein Förderband, das angeordnet ist, um Dosen durch die Dosenreinigungsvorrichtung (100) zu transportieren;
ein Gehäuse von länglicher Form, in dem das Förderband mittig angeordnet ist, das in einer Längsrichtung der Dosenreinigungsvorrichtung (100) arbeitet, wobei eine erste Seite einer Zufuhrseite (110) entspricht, wobei die Zufuhrseite (110) eine erste laterale Seite der Dosenreinigungsvorrichtung ist;
eine zweite Seite, die einer Zugangsseite (120) entspricht, wobei die Zugangsseite (120) eine zweite laterale Seite der Dosenreinigungsvorrichtung ist und sich gegenüber der ersten lateralen Seite befindet; wobei sich auf der Zugangsseite (120) eine abnehmbare Zugangsplatte (121) zum Öffnen des Gehäuses befindet; einen Zufuhrverteiler (130), der sich auf der Zufuhrseite (110) befindet;
einen Zufuhranschluss (132), der mit dem Zufuhrverteiler (130) in Strömungsverbindung steht; und einen Spühbalken (140), der angeordnet ist, um einen Sprühvorhang quer zu einer Längsrichtung der Dosenreinigungsvorrichtung (100), in der Dosen transportiert werden, zu erzeugen, wobei der Spühbalken (140) ein Einlassende (144) umfasst, das zur Verbindung mit dem Zufuhranschluss (132) angeordnet ist; und eine Führung (150), die sich vom Zufuhranschluss (132) zumindest zur Hälfte in Richtung der Zugangsseite (120) erstreckt, wobei die Führung (150) angeordnet ist, um den Spühbalken (140) beim Einführen des Spühbalkens (140) durch die Zugangsseite (120) aufzunehmen und zu tragen.

2. Dosenreinigungsvorrichtung nach Anspruch 1, wobei der Spühbalken (140) mehrere Auslässe (142) umfasst, die in einer Reihe angeordnet sind, und die Führung (150) einen Schlitz (158) ausbildet, wobei der Schlitz (158) angeordnet ist, um die mehreren Auslässe (142) aufzunehmen, wenn der Spühbalken (140) von der Führung (150) getragen wird.

3. Dosenreinigungsvorrichtung nach Anspruch 1, wobei die Führung (150) ein Andockende (159) umfasst, das so angeordnet ist, dass es um den Zufuhranschluss (132) passt, wobei die Führung (150) so angeordnet ist, dass sie lösbar mit dem Zufuhranschluss (132) gekoppelt ist.

4. Dosenreinigungsvorrichtung nach Anspruch 3, wobei das Andockende (159) der Führung (150) und der Zufuhranschluss (132) konfigurierbar sind, um anhand eines Bajonettverschlussmechanismus gekoppelt zu sein.

5. Dosenreinigungsvorrichtung nach einem der vorangehenden Ansprüche, wobei die Dosenreinigungsvorrichtung ein Stützelement umfasst, wobei das Stützelement angeordnet ist, um gegen eine Schwerkraft mit der Führung (150) in Eingriff zu stehen und diese zu stützen.

6. Dosenreinigungsvorrichtung nach einem der vorangehenden Ansprüche, wobei die Führung (150) eine Hülse (154) umfasst, die einen Durchgang (156) ausbildet und angeordnet ist, um den Spühbalken (140) in den Durchgang (156) aufzunehmen und den Spühbalken (140) darin zu tragen.

7. Dosenreinigungsvorrichtung nach einem der Ansprüche 1 oder 3 bis 6, wobei der Spühbalken (140) einen Auslass (142) umfasst, der konfiguriert ist, um Waschflüssigkeit abzuleiten.

8. Dosenreinigungsvorrichtung nach Anspruch 7, wobei der Auslass (142) konfiguriert ist, um eine Sprühdüse aufzunehmen.

9. Dosenreinigungsvorrichtung nach Anspruch 8, wobei der Spühbalken (140) im Wesentlichen zylindrisch ist; der Auslass (142) so angeordnet ist, dass er in eine radiale Richtung des Spühbalkens (140) weist; und die Sprühdüse, wenn sie vom Auslass (142) aufgenommen wird, so angeordnet ist, dass sie in die radiale Richtung sprüht.

10. Dosenreinigungsvorrichtung nach einem der Ansprüche 7 - 9, wobei die Führung (150) einen Schlitz (158) ausbildet, der so angeordnet ist, dass er den Auslass (142) aufnimmt, wenn der Spühbalken (140) von der Führung (150) getragen wird.

11. Dosenreinigungsvorrichtung nach Anspruch 2, wobei der Spühbalken (140) eine einzige Reihe von Auslässen (142) aufweist.

12. Dosenreinigungsvorrichtung nach einem der vorangehenden Ansprüche,
 ferner umfassend einen Verriegelungsmechanismus auf der Zugangsseite (120);
 wobei der Verriegelungsmechanismus so angeordnet ist, dass er mit einem Kappenende (146) des Spühbalkens (140) in Eingriff steht, um den Spühbalken (140) am Zufuhranschluss (132) zu sichern. 5
13. Dosenreinigungsvorrichtung nach Anspruch 12, wobei der Verriegelungsmechanismus eine Halterung umfasst, die konfigurierbar ist, um den Spühbalken (140) zu halten, und konfigurierbar ist, um den Spühbalken (140) außer Eingriff zu bringen. 10
14. Verfahren zum Ändern der Konfiguration eines Spühbalkens (140), wobei das Verfahren Folgendes umfasst: 15
- Bereitstellen einer Dosenreinigungsvorrichtung (100) nach einem der Ansprüche 12 bis 13; 20
 Zugreifen auf die Dosenreinigungsvorrichtung (100) auf der Zugangsseite (120);
 Außereingriffbringen eines Verriegelungsmechanismus, der auf der Zugangsseite (120) bereitgestellt und so angeordnet ist, dass er einen Spühbalken (140) sichert; 25
 Herausziehen des Spühbalkens (140) aus der Dosenreinigungsvorrichtung (100), dadurch Trennen des Spühbalkens (140) von einem Zufuhranschluss (132), der sich auf der Zufuhrseite (110) befindet und in Strömungsverbindung mit einem Zufuhrverteiler (130) steht, und Entfernen des Spühbalkens (140) aus einer Führung (150), die so angeordnet ist, dass sie den Spühbalken (140) trägt; 30
 wobei sich die Führung (150) vom Zufuhranschluss (132) zumindest über die Hälfte in Richtung der Zugangsseite (120) erstreckt. 35

Revendications

1. Appareil de nettoyage de boîtes (100) pour le traitement de boîtes, l'appareil de nettoyage de boîtes comprenant : 45
- une courroie transporteuse prévue pour transporter des boîtes à travers ledit appareil de nettoyage de boîtes (100) ; 50
 un boîtier de forme allongée, la courroie transporteuse étant disposée centralement, fonctionnant le long d'une direction longitudinale dudit appareil de nettoyage de boîtes (100),
 un premier côté correspondant à un côté d'alimentation (110), le côté d'alimentation (110) étant un premier côté latéral dudit appareil de nettoyage de boîtes ; 55
2. Appareil de nettoyage de boîtes selon la revendication 1, dans lequel la barre de pulvérisation (140) comprend une pluralité de sorties (142) disposées en une rangée et le guide (150) forme une fente (158), la fente (158) étant prévue pour recevoir la pluralité de sorties (142) lorsque la barre de pulvérisation (140) est portée par le guide (150).
3. Appareil de nettoyage de boîtes selon la revendication 1, dans lequel le guide (150) comprend une extrémité d'arrimage (159) qui est prévue pour s'ajuster autour de l'orifice d'alimentation (132), le guide (150) étant prévu pour s'accoupler de manière détachable à l'orifice d'alimentation (132).
4. Appareil de nettoyage de boîtes selon la revendication 3, dans lequel l'extrémité d'arrimage (159) du guide (150) et l'orifice d'alimentation (132) peuvent être configurés pour s'accoupler en utilisant un mécanisme de fixation à baïonnette.
5. Appareil de nettoyage de boîtes selon une quelconque revendication précédente, l'appareil de nettoyage de boîtes comprenant un organe de support, l'organe de support étant prévu pour venir en prise avec le guide (150) et le supporter à l'encontre d'une force de gravité.

un deuxième côté correspondant à un côté d'accès (120), le côté d'accès (120) étant un deuxième côté latéral dudit appareil de nettoyage de boîtes et étant situé à l'opposé du premier côté latéral ;
 un panneau d'accès amovible (121) étant situé sur ledit côté d'accès (120) pour ouvrir le boîtier ;
 un collecteur d'alimentation (130) situé sur le côté d'alimentation (110) ;
 un orifice d'alimentation (132) en communication fluide avec le collecteur d'alimentation (130) ; et une barre de pulvérisation (140) prévue pour générer un rideau de pulvérisation en travers d'une direction longitudinale de l'appareil de nettoyage de boîtes (100) suivant laquelle des boîtes sont transportées,
 la barre de pulvérisation (140) comprenant une extrémité d'entrée (144) prévue pour être connectée à l'orifice d'alimentation (132) ; et
 un guide (150) s'étendant depuis l'orifice d'alimentation (132) au moins sur la moitié de la distance vers le côté d'accès (120),
 le guide (150) étant prévu pour recevoir et porter la barre de pulvérisation (140) lors de l'insertion de la barre de pulvérisation (140) à travers le côté d'accès (120) .

6. Appareil de nettoyage de boîtes selon une quelconque revendication précédente, dans lequel le guide (150) comprend un manchon (154) formant un passage (156) et est prévu pour recevoir la barre de pulvérisation (140) dans le passage (156) et pour porter la barre de pulvérisation (140) dans celui-ci. 5
7. Appareil de nettoyage de boîtes selon l'une quelconque des revendications 1 ou 3 à 6, dans lequel la barre de pulvérisation (140) comprend une sortie (142) configurée pour décharger du liquide de lavage. 10
8. Appareil de nettoyage de boîtes selon la revendication 7, dans lequel la sortie (142) est configurée pour recevoir une buse de pulvérisation. 15
9. Appareil de nettoyage de boîtes selon la revendication 8, dans lequel la barre de pulvérisation (140) est sensiblement cylindrique ; la sortie (142) est prévue pour être pointée dans une direction radiale de la barre de pulvérisation (140) ; et la buse de pulvérisation, lorsqu'elle est reçue par la sortie (142), est prévue pour pulvériser dans la direction radiale. 20 25
10. Appareil de nettoyage de boîtes selon l'une quelconque des revendications 7 à 9, dans lequel le guide (150) forme une fente (158) prévue pour recevoir la sortie (142) lorsque la barre de pulvérisation (140) est portée par le guide (150). 30 35
11. Appareil de nettoyage de boîtes selon la revendication 2, dans lequel la barre de pulvérisation (140) présente une rangée unique de sorties (142). 40
12. Appareil de nettoyage de boîtes selon une quelconque revendication précédente, comprenant en outre un mécanisme de verrouillage sur le côté d'accès (120) ; le mécanisme de verrouillage étant prévu pour venir en prise avec une extrémité de capuchon (146) de la barre de pulvérisation (140) afin de fixer la barre de pulvérisation (140) à l'orifice d'alimentation (132). 45
13. Appareil de nettoyage de boîtes selon la revendication 12, dans lequel le mécanisme de verrouillage comprend une console pouvant être configurée pour retenir la barre de pulvérisation (140) et pouvant être configurée pour se désengager de la barre de pulvérisation (140). 50 55
14. Procédé pour changer la configuration d'une barre

de pulvérisation (140), le procédé comprenant :

fournir un appareil de nettoyage de boîtes (100) selon l'une quelconque des revendications 12 et 13 ;
 accéder à l'appareil de nettoyage de boîtes (100) au niveau du côté d'accès (120) ;
 désengager un mécanisme de verrouillage prévu sur le côté d'accès (120) et prévu pour fixer une barre de pulvérisation (140) ;
 tirer la barre de pulvérisation (140) de l'appareil de nettoyage de boîtes (100), ce qui permet de déconnecter la barre de pulvérisation (140) d'un orifice d'alimentation (132) situé sur le côté d'alimentation (110) et en communication fluidique avec un collecteur d'alimentation (130), et enlever la barre de pulvérisation (140) d'un guide (150) prévu pour porter la barre de pulvérisation (140) ;
 le guide (150) s'étendant depuis l'orifice d'alimentation (132) au moins sur la moitié de la distance vers le côté d'accès (120).

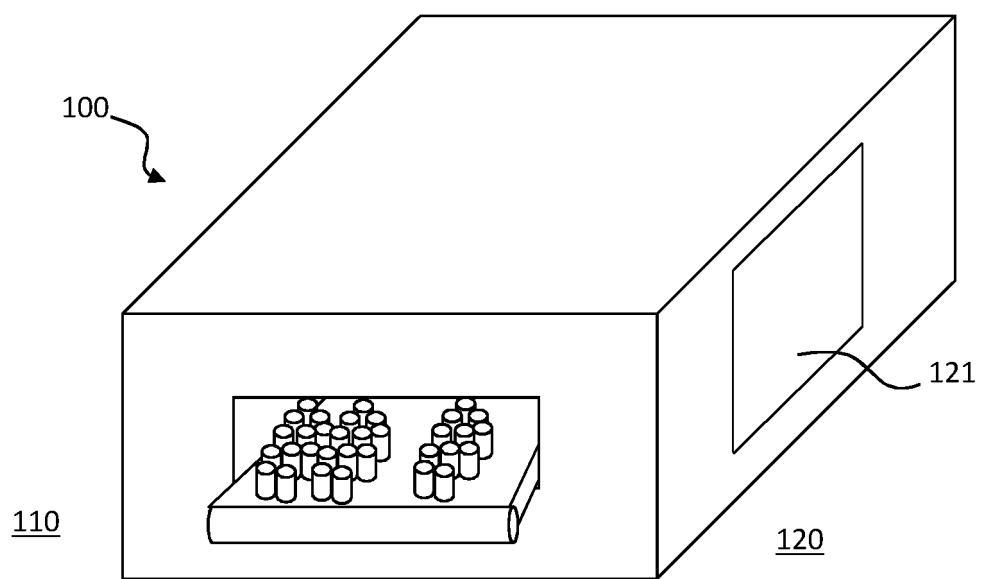


Fig. 1

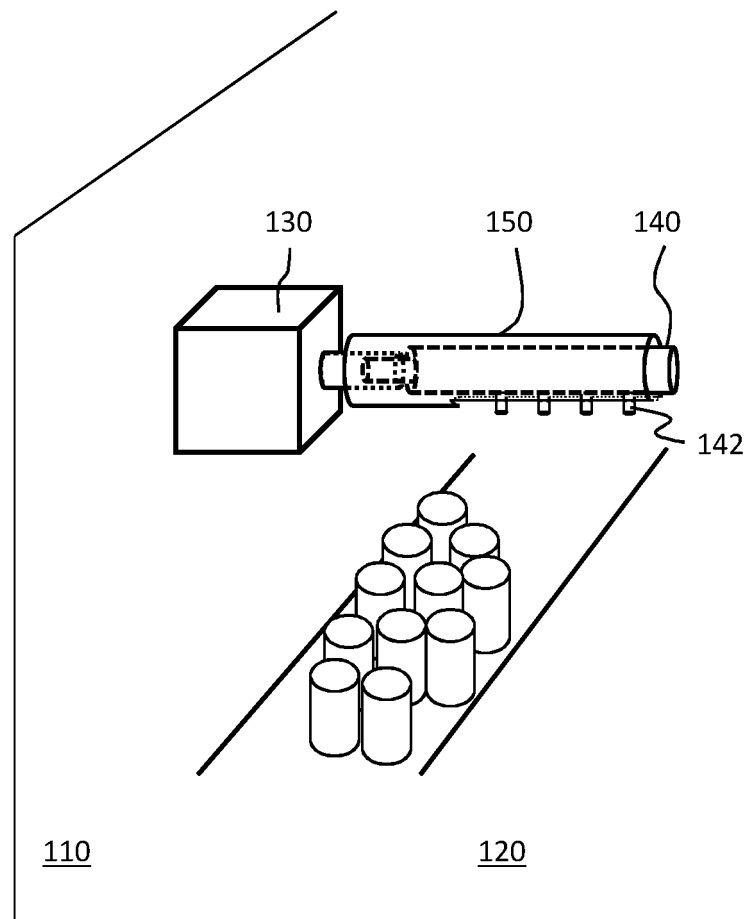


Fig. 2

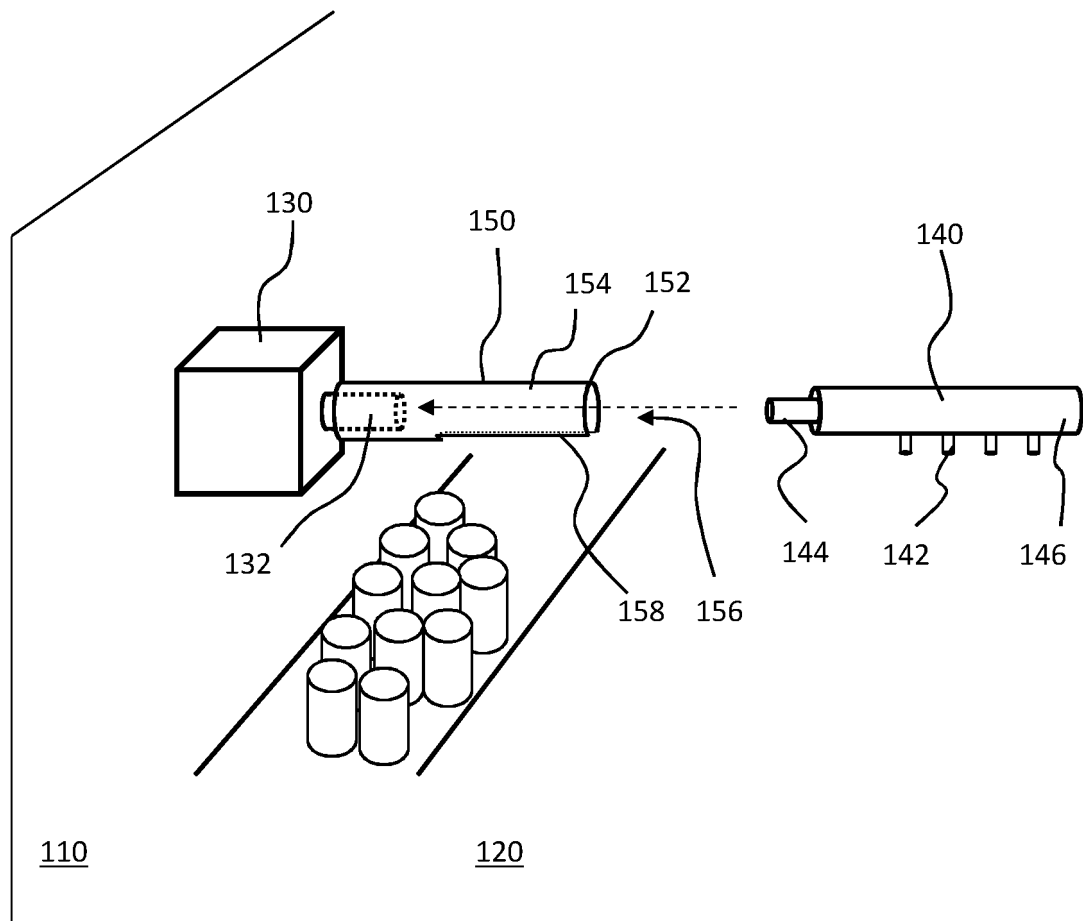


Fig. 3

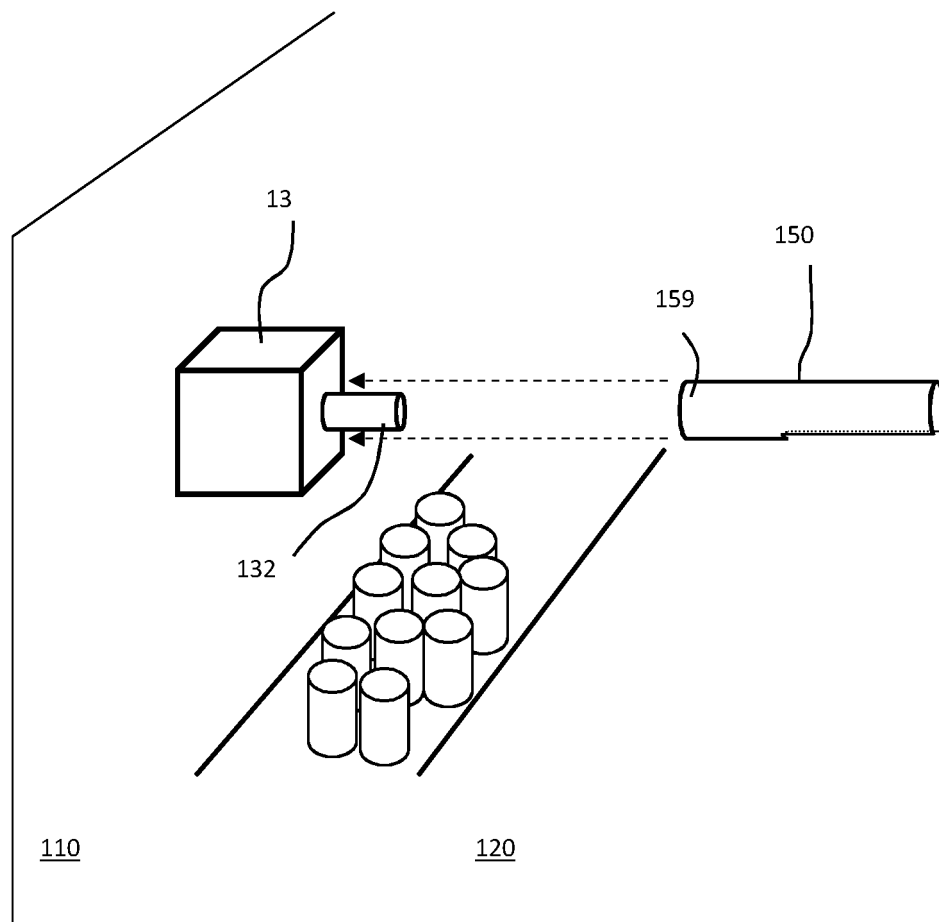
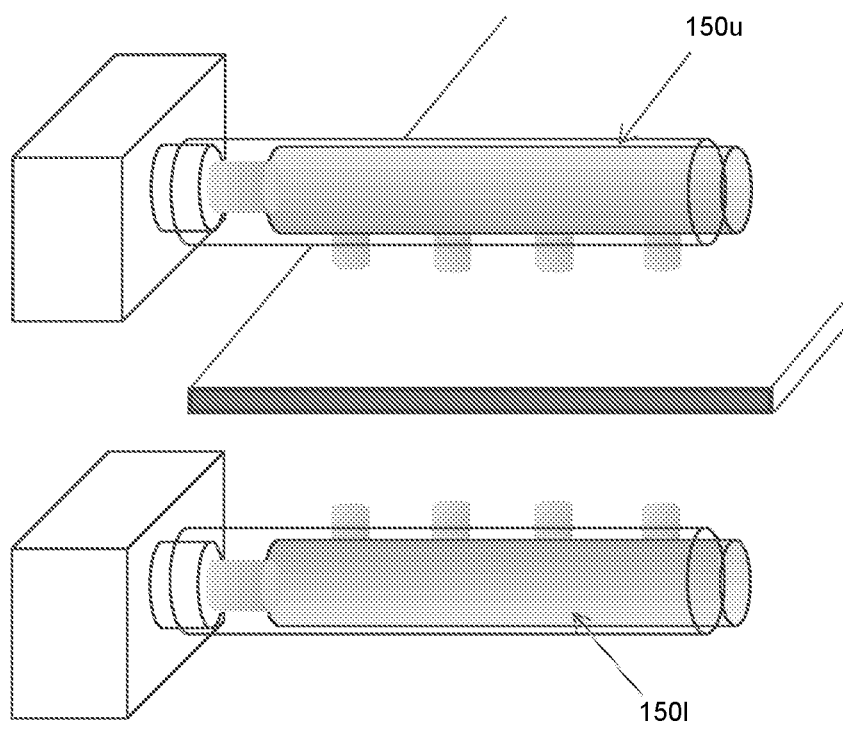


Fig. 4

Figure 5



REFERENCES CITED IN THE DESCRIPTION

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