A device (1) is proposed for attaching spray pumps (5), dispensers or similar items to containers (43) and for locking said containers, having a gripping device to take hold of the spray pump (5) or similar item and a locking element (23) for screwing a closure (57) tightly on the container (43). The distinguishing feature of the device is that the locking element (23) is designed as a separate component.
DEVICE AND METHOD FOR ATTACHING SPRAY PUMPS OR SIMILAR ITEMS TO CONTAINERS AND FOR LOCKING SAID PUMPS

[0001] The invention relates to a device for attaching spray pumps, dispensers or similar items to containers and for locking said pumps in accordance with the preamble of claim 1 and a method for inserting spray pumps and similar items into containers and for locking said pumps in accordance with the preamble of claim 11.

[0002] Devices and methods of the type addressed here are known. A filled container is equipped with a spray pump, a dispenser or similar item in one operation and locked. The device required for this is extremely complex. It, as well as the way in which the procedure is performed, is consequently prone to malfunctions.

[0003] The object of the invention is therefore to create a device and a method of the type addressed above the distinguishing feature of which is that the disadvantages mentioned are avoided.

[0004] To achieve this object, a device is proposed which has the features named in claim 1. It comprises a gripping element to take hold of the spray pump and similar items and a locking element to screw a closure tightly on the container. Its distinguishing feature is that the locking element is designed as a separate component.

[0005] Additional embodiments will become evident from the dependent claims.

[0006] To achieve this object, a method is also proposed which comprises the features of claim 11. Its distinguishing feature is that the insertion of the spray pump and similar items into a container and locking said container are carried out in separate procedural steps.

[0007] The invention is explained in more detail in what follows with reference to the accompanying drawings.

[0008] FIG. 1 shows a device to insert spray pumps or similar items into containers and to lock said containers in a first operating position;

[0009] FIG. 2 shows the device from FIG. 1 in a second operating position and

[0010] FIG. 3 shows the device from FIG. 1 in a third operating position.

[0011] The device shown in FIG. 1 serves to attach spray pumps, dispensers and similar items to filled containers and to lock the container. The device 1 has a gripping device 3 which serves to pick up a spray pump from a delivery device, for example from a star wheel. The delivery device 7 can also convey dispensers or similar items in place of spray pumps.

[0012] The gripping device 3 is maintained at a specified height by a suitable mount 11. A gripper 15 can be moved up and down on a center axis 17 of the gripping device 3 opposite the mount 11 by a suitable control device, for example by a lifting cam 13 system.

[0013] In the case of the operating position reproduced in FIG. 1, the gripper 15 was lowered in the direction of the arrow 19 to take hold of the spray pump 5 in the delivery device 7. A suitable control cam system 21 to open and close the gripper 15 is indicated in FIG. 1. By means of the lifting cam system 13 and the control cam system 21, a precise upward and downward movement of the gripper 15 is possible, in which the gripper is opened or closed as a function of its position to take hold of or to release a spray pump 5.

[0014] The upward and downward movement of the gripper 15 can also be implemented in a different way. The opening and closing of the gripper 15 can be carried out by a suitable motor or similar.

[0015] It can also be seen from FIG. 1 that in the operating position shown here a spray pump 5 has been delivered by a delivery device 7 into the gripping range of the gripper 15 and that the gripper 15 is taking hold of it in a suitable manner.

[0016] The device 1 additionally has a locking element 23 which is attached to a suitable mount 11 and is thereby maintained at a specific height. It has a drive unit 25 designed as a servo drive which drives a locking roller. The locking element 23 is moveable substantially perpendicular to the center axis 31 of the drive unit 25 by a suitable translocating device. More details about this will be provided hereinafter.

[0017] The translocating device 29 is preferably a mechanical design. It is also conceivable to provide a pneumatic, hydraulic or electromagnetic device.

[0018] The locking roller 27 cooperates with a supporting device 33 which has at least one, preferably two support rollers 35 which are rotatable about an axis of rotation 7 and are positioned at a distance from the locking roller 27.

[0019] The tube guide 39 can preferably be actuated mechanically. However, other actuating devices of the pneumatic, hydraulic or electromagnetic type are also conceivable.

[0020] A tube guide 39 is provided at the mount 11 which can be displaced relative to the center axis 17 and serves to guide the suction tube of the spray pump 5 when it is inserted into a container. More details will be provided hereinafter.

[0021] The device 1 here comprises a transportation device 41 for the filled containers into which the spray pump 5 is inserted. Express mention should be made here that the device 1 can be executed independently of the transportation device 41 and implemented as a separate subassembly.

[0022] FIG. 2 shows the device 1 as it was explained in FIG. 1 in a second operating position. Identical parts are given identical reference numerals, so that in this regard reference is made to the description for FIG. 1.

[0023] In the operating position in accordance with FIG. 2, the delivery device 7 is no longer positioned within effective range of the gripping device 3. Instead, a container 43 has been brought up by the delivery device 41 and positioned such that its center axis 45 is in alignment with the center axis 17 of the gripping device 3 and thereby of the spray pump 5.

[0024] Its suction tube 47, also described as a riser tube, is concentric with the center axis 17 of the gripping device 3 and the center axis 45 of the container 43 and can thus be introduced into the opening 49 of the container 43.
FIG. 2 shows by an arrow 51 that the tube guide 39 has been displaced essentially perpendicular to the suction tube 47 in order to guide it positively when it is introduced into the opening 49 of the container 43.

In the operating position shown here, the spray pump 5 is held securely by the gripper 15 so that it can be moved by the gripping device 3 during the remainder of the procedure.

FIG. 3 shows the device 1 in a third operating position. Parts which were explained in FIGS. 1 and 2 have been given the same reference numerals for the sake of simplicity. Reference is accordingly made to the description of the previous figures.

FIG. 3 shows that with the aid of the lifting cam system 13 which serves as the height control, the gripper 15 has been lowered relative to the mount 11 in the direction of the center axis 17 to insert the spray pump 5 completely into the container 43. To accomplish this, the gripper 15, together with the spray pump 5, is moved downward in the direction of the center axis 17 of the gripping device 3 and thus in the direction of the center axis 45 of the container 43. The suction tube 47 of the spray pump 5 is guided by the tube guide 39 over a large part of the translational distance. Immediately before the head of the spray pump reaches the opening, the tube guide 39 is withdrawn so that it is not damaged by the head or by the gripper 13.

In the operating position in accordance with FIG. 3, the locking element 23 and the supporting device 33 have been displaced towards each other, perpendicular to the center axis 31 of the drive unit 25 or perpendicular to the center axis 17 of the gripping device 3 respectively, as indicated by the arrows 53 and 55. The locking roller 27 is displaced towards a closure 57 of the spray pump 5, in like manner the support rollers 35 of the supporting device 33 are displaced towards the seal 57.

When the locking element 23 and the supporting device 33 are activated, the closure 57 is clamped between the locking roller 27 and the at least one support roller 35 and when the locking roller 27 is rotated, the closure can be rotated about the center axis 45 of the container 43 and screwed tightly thereto. In this way, the spray pump 5 is securely attached to the container 43 and the container is locked.

From these explanations it becomes clear that with stable containers 43 which are held securely by the transportation device 41 it is possible to dispense with the supporting device 43 if necessary. However, the advantage of the embodiment shown here is that light containers 43 which are unstable to a greater or lesser degree can be locked in a simple manner without being pushed from their position by the locking roller 27 of the locking element 23.

After the container 23 is locked, the locking roller 27 and the at least one support roller 35 is displaced outward relative to the center axis 17 of the gripping device 3, or the center axis 45 of the container 43 respectively, so that the closure 43 is released.

Now the gripping device 3 can be displaced upwards in the direction of the center axis 17 by means of the lifting cam system 13 and is thus ready to remove a new spray pump 5 from a delivery device 7 and set it on a container 43.

From the explanations it becomes clear that the device 1 has a gripping device 3 and a locking element 23 configured separately, so that their construction is relatively simple. Specifically, it is also possible to employ different gripping devices 3 and locking elements 23 since they can be exchanged separately.

In addition, it is intended that the device 1 be designed in such a way that the locking element 23 can be controlled separately from the gripping device 3.

From the figures it is clear that the tube guide 39 is preferably assigned to the locking element 23. This results in a compact structure for the device 1. It is also conceivable to secure the tube guide 39 through a separate mount and to position it at a suitable point.

The device 1 described here can be part of a locking system in which the spray pumps 5 and the containers 43 are moved on circular paths, similarly the gripping device 3 and the locking element 23. It is also conceivable to move the individual assemblies of the device 1 in a linear fashion.

It is essential that the device 1 can be configured separately or as part of a locking system and that the individual assemblies can be adapted very easily to different performance ranges. It is thereby possible to implement devices 1 which lock a large number of containers per unit of time. Consistent locking torques can be ensured across all ranges by means of the locking element 23. This also serves to align the closures 57 which are part of the spray pump 5 relative to the container 43. Even with a high pass-through rate, the device 1 ensures that the spray pumps 5 are inserted accurately into the container 43 because their suction tubes 43 are positioned and guided precisely by the tube guide 39.

By using suitable sensors, it can be ensured that the spray pump 5 is only lowered when a container 43 is present and that the locking element 23 can only be activated when a spray pump 5 has been installed on a container 43.

Wear on the device when in operation is especially low because a closure 47 is clamped firmly between the locking roller 27 and the at least one support roller 53 so that slippage of the locking roller 27 is practically eliminated.

Although the gripping device 3 and the locking element 23 are separate components inside the device 1, mechanical or electrical controls ensure that the separately activatable components are synchronized to each other in such a way that reliable operation results.

All in all, it can be seen that the device 1 is simply constructed and consequently service-friendly and reliable in operation.

From the explanations for FIGS. 1 to 3, the method for inserting spray pumps and similar items into containers and for locking same by means of a closure becomes clear immediately. The essential aspect is that the method can be implemented simply and without malfunctions.

In the case of the embodiment of the device 1 explained with reference to FIGS. 1 to 3, it was assumed that the closure 57 is designed as a screw top. It is also quite possible to design the locking element 23 in such a way that press-on caps can be attached to a container 43 with its
assistance, a spray pump 5, a dispenser or similar item is located to the container 43 and the latter locked.

[0045] The device 1 and the method can be employed in a very flexible manner. Spray pumps 5 of very different construction can be inserted into containers 43 of the most diverse shapes. It is also possible to insert dispensers or similar items into containers of the type addressed here, to secure them to the container by means of a closure 57 and to lock said container.

[0046] From the explanations of the device and the method, the following becomes clear:

[0047] An essential aspect is the fact that the gripping device 3 and the locking unit designated as the locking element 23 are assigned one to the other spatially in such a way that they cooperate with a container 43 in one and the same processing position: A spray pump, a dispenser or similar item is attached to the container 43 by means of the gripping device. Then the container is locked by means of the locking element 23 by screwing the spray pump, the dispenser or similar item tightly onto the container 43.

[0048] Firstly, based on this embodiment of the device it is ensured that attaching spray pumps, dispensers or similar items to a container and locking same can be carried out very simply. There is no need to displace the container additionally and align it relative to the locking element after a spray pump or similar item has been attached. In addition, because of the spatial-geometric positioning of gripping device 3 and locking element 23, the latter can be provided with a tube guide 39 which ensures that the spray pump, the dispenser or similar item is inserted accurately into the opening of the container 43. Since the locking element 23 is located in the immediate spatial proximity of the gripping device 3, an additional mount for the tube guide 39 is not absolutely necessary.

[0049] On the one hand, the device of the type addressed here can executed extremely compactly, on the other hand, because of the separate disposition of gripping device 3 and locking element 23, it is easily possible to provide different gripping devices or locking elements and to adapt the device to diverse spray pumps, dispensers or similar items and also to design the locking element differently in order to realize diverse types of closure, whether screw top, bayonet top or press top. The device can therefore, as mentioned, be adapted flexibly to diverse types of processing. Separate replacement is also possible in the event of a defect.

[0050] It can be seen that the method addressed here can be implemented simply and economically. It is beneficial that the gripping device 3 and the locking element 23 can cooperate in one and the same processing position with a container 43 and that they do not have to be displaced between the insertion of a spray pump, a dispenser or similar item and the locking element. In doing this, additional alignment of the container 43 relative to the locking element 23 would frequently be necessary.

[0051] The spatial arrangement of gripping device and locking element results ultimately in containers being equipped and locked easily on the one part and on the other in a very compact configuration of the device addressed here. It can be seen from the Figures that a mount 11 for the gripping device 3 and an mount 11' for the locking element 23 are provided. It is easily possible to provide a common mount for the two elements, gripping device 3 and locking element 43 of the device. In addition to the compact construction, this also results in a trouble-free potential implementation of the apparatus.

1. Device for attaching spray pumps, dispensers or similar items on containers and for locking said pumps, having a gripping device to take hold of the spray pump or similar item and a locking element to screw a closure tightly on the container, wherein the locking element is designed as a separate component, the gripping device and the locking element arranged spatially to each other so as to cooperate with the container at one and the same position.

2. Device from claim 1, wherein the locking element can be activated separately.

3. Device from claim 1, wherein the gripping device can be displaced—preferably in the vertical direction.

4. Device from claim 1, wherein the locking element has at least one locking roller.

5. Device from claim 1, wherein the locking roller can be displaced—substantially perpendicular to its axis of rotation.

6. Device from claim 1, wherein the locking element has a supporting device.

7. Device from claim 1, wherein the supporting device has at least one, preferably two support rollers.

8. Device from claim 1, wherein the supporting device can be displaced—substantially perpendicular to the axis of rotation of the at least one support roller.

9. Device from claim 1, further comprising a tube guide for the spray pump or similar item.

10. Device from claim 1, wherein the tube guide is assigned to the gripping device.

11. Method for attaching spray pumps, dispensers and similar items on containers and for locking said pumps specifically by means of a device from claim 1, wherein the insertion of the spray pumps and similar items and the locking of the containers is carried out in separate steps, wherein the gripping device and the locking element cooperate with the container at one and the same processing position.