

(19)



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(11)

EP 1 109 679 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

22.10.2003 Bulletin 2003/43

(21) Application number: **99940229.0**

(22) Date of filing: **31.08.1999**

(51) Int Cl.7: **B44D 3/08**

(86) International application number:
PCT/FI99/00711

(87) International publication number:
WO 00/013920 (16.03.2000 Gazette 2000/11)

(54) **PAINT TONING MACHINE**

FARBABTÖNUNGSMASCHINE

MACHINE A TEINTER LA PEINTURE

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**

(30) Priority: **02.09.1998 FI 981880**

(43) Date of publication of application:
27.06.2001 Bulletin 2001/26

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Description

[0001] The invention relates to a paint toning machine comprising several containers for toning paste, the elevation of the containers being dependent on the amount of the toning paste they contain, and paste feeding devices interacting with the containers for toning paste, the feeding devices comprising a directional valve, a pump and a feed nozzle connected to the directional valve, and a flexible connection between the directional valve and the container for toning paste, which connection allows the vertical movement of the container for toning paste and the flow of the toning paste from the container for toning paste via the directional valve to the feeding pump during the suction phase thereof. See, for example, the machine illustrated in GB-A-2 115 784. When a particular container runs out of toning paste in this type of paint toning machines, a Hall sensor provides an alarm signal as the container rises for example by means of spring force when the amount of the paste decreases. When the container rises from the machine, it is also possible to visually detect the container from which the paste is running out. This naturally requires that the container and the paste feeding device are connected together flexibly. Such a flexible connection between the container and the paste feeding device that are spaced from one another has been previously implemented by means of a flexible hose.

[0002] The prior art hose coupling has caused problems especially in a carousel-type paint toning machine, which has relatively little available space and where the coupling is subject to damages.

[0003] An objective of the present invention is thus to improve the connection between a container for toning paste and a feeding device in order that the aforementioned problems could be avoided. This objective is achieved with a paint toning machine according to the invention, which is characterized in that an output of the container for toning paste and an input of the directional valve, each connected to the flexible connection, are placed substantially one on top of the other, the flexible connection being formed of a collapsible fitting.

[0004] The invention is based on the idea of placing the container and the paste feeding device as close to each other as possible, however in such a manner that the aforementioned relative movement between the elements is possible. This can be implemented by means of a suitably collapsible and tight fitting.

[0005] It is most preferable that the flexible, collapsible fitting is formed of a flexible bellows.

[0006] Alternatively, the flexible, collapsible fitting could be formed of, for example, two cylinders placed one within the other and arranged to move telescopically together, and of a seal provided between the cylinders. However, such an arrangement does not guarantee that the container rises as easily as in the other alternatives due to the sealing that is required between the cylinders.

[0007] Advantages of the paint toning machine ac-

cording to the invention include a more compact structure and more reliable operation than previously, as well as lower costs of manufacturing the machine.

[0008] The invention will be described below in greater detail in connection with preferred embodiments, with reference to the accompanying drawings, in which

Figure 1 is a perspective view of a carousel-type paint toning machine according to the invention; Figure 2 is a more detailed view of a feeding device in the paint toning machine according to the invention, a container for toning paste connected to the device, and connections between the feeding device and the paste container; and

Figure 3 shows an alternative implementation of the flexible connection between the feeding device and the container for toning paste.

[0009] With reference to Figure 1, a paint toning machine according to the invention, which is a carousel-type machine in this example, comprises a frame 1, an annular carousel base 3 arranged rotatably in an upper part 2 of the frame, containers 4 for toning paste placed in a circle on the carousel base 3, some of the containers being deleted from the figure or shown in a sectional view, a rotary motor 5, preferably an electric motor, for rotating the carousel base, a paste feeding device 6 connected to each paste container 4, and means 7 for operating the paste feeding devices 6. A lower part 8 of the frame also comprises a rack 9 with an adjustable elevation for a paint can 10.

[0010] The paste feeding device 6 connected to each container 4, shown in greater detail in Figure 2, comprises a pump 11, a directional valve 12 and a feed nozzle 13. When the container 4 with the desired paste has been moved to the feeding point at the paint can 10, the paste is fed by means of the pump 11 which is operated by actuating means 7 (Figure 1) that move a piston rod 14 of the pump upwards and downwards. When paste is being drawn from the container 4, the directional valve 12 is turned by means of a control lever 15 thereof into a position which allows the paste to flow through the directional valve 12 into the pump 11 when the piston rod 14 is pulled up. When a required amount of the paste has been drawn into the pump 11, the control lever 15 is turned into a position which allows the feeding of the paste from the pump 11 via the directional valve 12 to the feed nozzle 13 and from there to the paint can 10 as the piston rod 14 is pressed down with the actuating means 7. Such a feeding technique is previously known in the field, wherefore it will not be described in greater detail.

[0011] In this paint toning machine the containers 4 are placed on the carousel base 3 such that their elevation depends on the amount of the toning paste they contain, i.e. the containers rise upwards as the amount of the paste in the containers decreases. This arrangement is implemented with springs 16 placed between

the carousel base 3 and the bottom of each container 4, and the stiffness of the springs can be adjusted by regulating means 17. The rising of the paste container 4 to a predetermined threshold value is detected by a Hall sensor 18, which gives the alarm to activate the filling of the container 4.

[0012] The arrangement described above requires that a connection 19 between the directional valve 12 and the container 4 is flexible. In the present invention in the arrangement shown in Figure 2, this is implemented such that the flexible connection 19 is connected to an output 20 of the paste container 4 and to an input 21 of the directional valve 12, which are placed substantially one on top of the other, whereupon the flexible connection is formed of a collapsible fitting, preferably a bellows 19 made of a flexible material. The flexible material can be rubber or any other material with elastic properties that allow the aforementioned vertical movement of the container 4. The minimum distance between the paste container 4 and the directional valve 12 is determined by the length of the container's vertical movement (usually about 10 mm). This distance is preferably as short as possible, which means that also the length of the bellows 19 is small.

[0013] In an alternative implementation shown in Figure 3, the flexible, collapsible fitting 119 consists of two cylinders 119a, 119b placed one within the other and arranged to move telescopically together, and of a seal 119c between the cylinders. This kind of arrangement could also be formed between an extension 22 of the input 21 of the directional valve 12 and the output 20 of the container 4 shown in Figure 2, if the diameter of the extension is lengthened and a seal is provided between the extension 22 and the inner wall of the output 20.

[0014] The above description of the invention is only intended to illustrate the basic idea of the invention. However, a person skilled in the art can implement the details thereof in various alternative ways within the scope of the appended claims. Further, the arrangement according to the invention could also be applied in connection with a toning machine where the containers for toning paste are aligned.

Claims

1. A paint toning machine comprising several containers (4) for toning paste, the elevation of the containers being dependent on the amount of the toning paste they contain, and paste feeding devices (6) interacting with the containers for toning paste, the feeding devices comprising a directional valve (12), a pump (11) and a feed nozzle (13) connected to the directional valve, and a flexible connection (19; 119) between the directional valve and the container for toning paste, which connection allows the vertical movement of the container for toning paste and the flow of the toning paste from the container for

toning paste via the directional valve to the feeding pump during the suction phase thereof, **characterized in that** an output (20) of the container (4) for toning paste and an input (21) of the directional valve (12), each connected to the flexible connection (19; 119), are placed substantially one on top of the other, the flexible connection being formed of a collapsible fitting (19; 119).

2. A paint toning machine according to claim 1, **characterized in that** the flexible, collapsible fitting is formed of a flexible bellows (19).
3. A paint toning machine according to claim 1, **characterized in that** the flexible, collapsible fitting (119) is formed of two cylinders (119a, 119b) placed one within the other and arranged to move telescopically together, and of a seal (119c) provided between the cylinders.
4. A paint toning machine according to any one of the preceding claims, **characterized in that** the paint toning machine is a carousel-type machine, where the containers (4) for toning paste and the paste feeding devices (6) are arranged on a rotating carousel base (3).

Patentansprüche

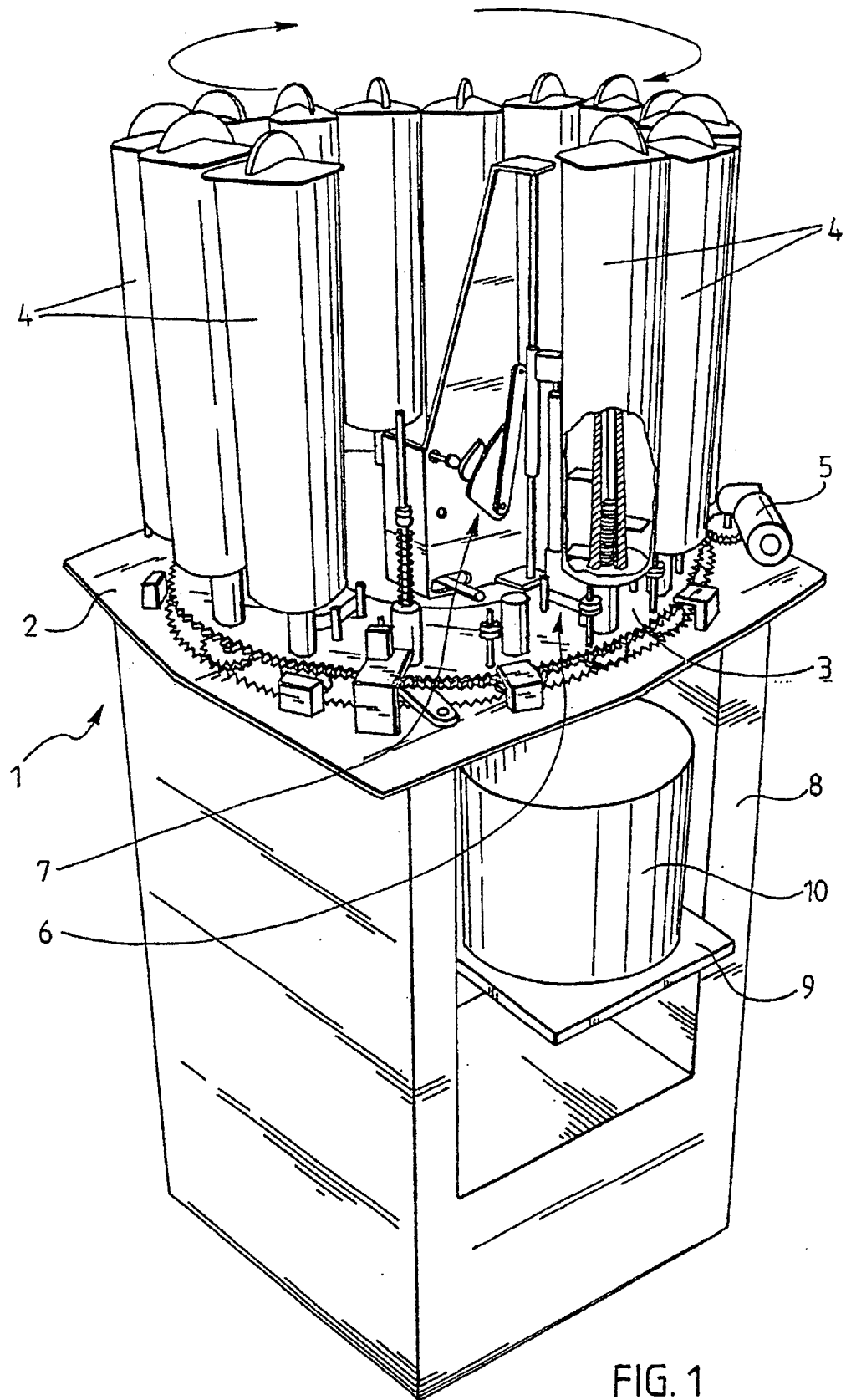
1. Farabtönungsmaschine mit mehreren Behältern (4) für Abtönungspaste, wobei die Höhenlage der Behälter von der Menge der Abtönungspaste abhängt, die sie enthalten, und Pastenzuführvorrichtungen (6), die mit den Behältern für Abtönungspaste zusammenwirken, wobei die Zuführvorrichtungen ein Wegeventil (12), eine Pumpe (11) und eine Zufühdüse (13) aufweisen, die mit dem Wegeventil verbunden ist, und einer flexiblen Verbindung (19; 119) zwischen dem Wegeventil und dem Behälter für Abtönungspaste, welche Verbindung die Vertikalbewegung des Behälters für Abtönungspaste und das Fließen der Abtönungspaste vom Behälter für Abtönungspaste über das Wegeventil zu der Zuführpumpe während deren Ansaugphase ermöglicht, **dadurch gekennzeichnet, dass** ein Auslass (20) des Behälters (4) für Abtönungspaste und ein Einlass (21) des Wegeventils (12), die jeweils an die flexible Verbindung (19; 119) angeschlossen sind, im Wesentlichen übereinander gesetzt sind, wobei die flexible Verbindung aus einem zusammendrückbaren Anschlussstück (19; 119) gebildet ist.
2. Farabtönungsmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** das flexible, zusammendrückbare Anschlussstück aus einem flexiblen Faltenbalg (19) gebildet ist.

3. Farbabtönungsmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** das flexible, zusammen-drückbare Anschlussstück (119) aus zwei Zylindern (119a, 119b) gebildet ist, die ineinander gesteckt und so angeordnet sind, dass sie sich zusammen teleskopartig bewegen, und aus einer zwischen den Zylindern vorgesehenen Dichtung (119c). 5
4. Farbabtönungsmaschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Farbabtönungsmaschine eine Maschine in Karussellbauart ist, wo die Behälter (4) für Abtönungspaste und die Pastenzuführvorrichtungen (6) auf einer sich drehenden Karussellbasis (3) angeordnet sind. 10 15

que des revendications précédentes, **caractérisée en ce que** la machine à teinter la peinture est une machine de type carrousel, où les récipients (4) destinés à la pâte à teinture et des dispositifs d'alimentation en pâte (6) sont agencés sur une base de carrousel rotative (3).

Revendications

1. Machine à teinter la peinture comprenant plusieurs récipients (4) destinés à la pâte de teinture, la hauteur des récipients dépendant de la quantité de pâte de teinture qu'ils contiennent, et des dispositifs d'alimentation en pâte (6) interagissant avec les récipients destinés à la pâte de teinture, les dispositifs d'alimentation comprenant une vanne directionnelle (12), une pompe (11) et une buse d'alimentation (13) reliée à la vanne directionnelle, et un raccord flexible (19 ; 119) entre la vanne directionnelle et le récipient destiné à une pâte de teinture, lequel raccord permet le mouvement vertical du récipient pour la pâte de teinture et l'écoulement de la pâte de teinture depuis le récipient pour la pâte de teinture, par l'intermédiaire de la vanne directionnelle vers la pompe d'alimentation durant la phase d'aspiration de celle-ci, **caractérisée en ce qu'une** sortie (20) du récipient (4) destinée à la pâte de teinture et une entrée (21) de la vanne directionnelle (12), chacune reliées au raccord flexible (19 ; 119), sont placées pratiquement l'une au-dessus de l'autre, le raccord flexible étant formé d'un assemblage pouvant être comprimé (19 ; 119). 20 25 30 35 40
2. Machine à teinter la peinture selon la revendication 1, **caractérisée en ce que** l'assemblage flexible pouvant être comprimé est formé d'un soufflet flexible (19). 45
3. Machine à teinter la peinture selon la revendication 1, **caractérisée en ce que** l'assemblage flexible pouvant être comprimé (119) est formé de deux cylindres (119a, 119b) placés l'un à l'intérieur de l'autre et agencés pour se déplacer ensemble de façon télescopique, et d'un joint (119c) disposé entre les cylindres. 50 55
4. Machine à teinter la peinture selon l'une quelcon-



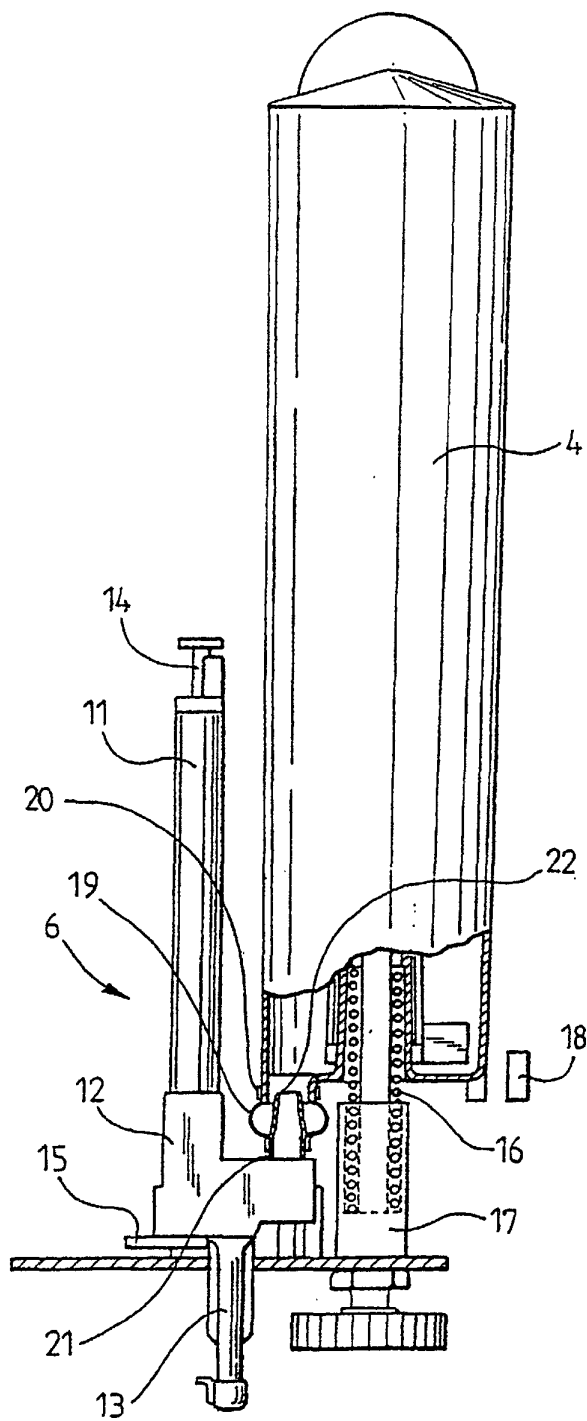


FIG. 2

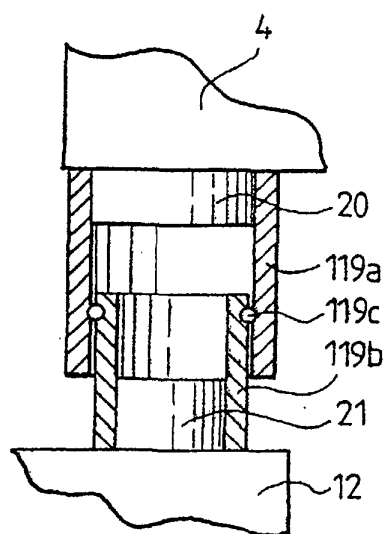


FIG. 3