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(54) **Device for cleaning paint buckets**

Gerät zur Reinigung von Farbeimern

Machine pour le nettoyage des pots de peinture

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Description

[0001] The invention relates to the cleaning of paint buckets. The invention relates particularly to the cleaning of large paint buckets for professional and industrial use, with a volume in the order of magnitude of 100-500 litres.

[0002] In the prior art such buckets are handled manually by one or more members of staff for the purpose of placing them in a cleaning device, where they are scraped as empty as possible by a scraper device and the paint residues present on the inner surface of the buckets are thus removed, and are then positioned at a flushing station where they are flushed clean with force by means of one or more spray nozzles.

[0003] The buckets are relatively large and have a weight in the order of 10 kg. In some circumstances the paint residues can have a weight of several tens of kilograms, whereby the lifting and turning-over of the buckets necessary for the cleaning operations is heavy work, which is therefore normally carried out by two members of staff together.

[0004] Such a method of handling the paint buckets is impractical, is in some countries contrary to official regulations relating to working conditions, and can easily result in disruptions of equipment and accidents.

[0005] A device for automatically cleaning containers is known from document EP 0 847 813 in which the containers are lifted up and tilted upside down for cleaning with flushing means.

[0006] It is an object of the invention to obviate the described inconvenience and limitations of the prior art. In this respect the invention provides a device for automatically cleaning used and emptied paint buckets, each comprising a bottom, a body with a mouth opening and a curled mouth rim extending around this mouth opening, which device comprises:

optional supply means for successively supplying one upright bucket at a time;

a first lifting column which connects with a first side to the optional supply means and along which a first gripper is displaceable up and downward on both sides and is pivotable over the upper end of the first lifting column from the one side to the other and in reverse direction;

first positioning means connecting to the second side of the first lifting column for temporarily carrying one bucket at a time in upside down position and holding it in position with some force;

scraper means present under the first positioning means for removing by means of a scraping operation at least a part of paint residues present on the inner surface of the bucket;

transport means connecting to the first positioning means;

a second lifting column which connects with a first side to the transport means and along which a second gripper is displaceable up and downward on

both sides and is pivotable over the upper end of the second lifting column from the one side to the other and in reverse direction;

second positioning means present on the first side of the second lifting column for carrying one bucket at a time in upside down position and holding it in position with some force;

flushing means present under the second positioning means for removing by means of a flushing operation the last paint residues present on the inner surface of the bucket; and

carrying means connecting to the second side of the second lifting column for carrying one or a number of upright buckets stacked onto each other in nested relation;

wherein successive buckets supplied in upright position by the supply means are gripped one at a time by the first gripper, displaced upward on the first side of the first lifting column, tilted over the upper end of the first lifting column, displaced downward on the second side of the first lifting column, placed on the first positioning means, subjected by the scraper means to a scraping operation, displaced upward by the first gripper to a chosen height, gripped by the transport means, displaced by these transport means to the second gripper, gripped by this second gripper and displaced downward and placed on the second positioning means, subjected to a flushing operation by the flushing means, displaced upward along the first side of the second lifting column by the second gripper, tilted over the upper end of the second lifting column, displaced downward on the second side of the second lifting column, and placed on the carrying means or in nested relation on a bucket already placed on these carrying means such as to form a stack of cleaned, upright buckets in nested relation.

[0007] In a determined embodiment the device has the special feature that the supply means comprise an endless conveyor.

[0008] Very simple and inexpensive to manufacture is an embodiment in which the first gripper comprises a fork with two teeth, which teeth have straight mutually parallel grooves on their sides directed toward each other such that the mouth rim of a bucket supplied by the supply means is pushed into these grooves and is thus gripped by the first gripper.

[0009] It will be apparent that the dimensioning of the grooves and the mutual distance between the teeth must be chosen in accordance with the dimensions of the mouth rims of the buckets to be handled.

[0010] A very practical embodiment has the special feature that the transport means can support the mouth rim of a bucket and can remove the mouth rim by a sliding displacement from the grooves. This variant can have the special feature that the transport means comprise a platform which is displaceable reciprocally between the first lifting column and the second lifting column and which is provided with holding means for fixedly holding

the mouth rim of one bucket at a time.

[0011] This latter embodiment can be embodied such that the holding means comprise a number of spring-loaded tongues extending out of the plane of the platform.

[0012] According to yet another aspect of the invention, the device has the special feature that the second gripper comprises two clamping jaws movable toward and away from each other such that a bucket supplied by the transport means can be engaged in each case on its body or its mouth rim by the two clamping jaws being moved toward each other, and can be released at the position of the carrying means by moving the clamping jaws apart.

[0013] An important aspect of the invention lies in the fact that the driving of the first gripper and the driving of the second gripper is of the type which comprises a carriage which bears the relevant gripper and which is guided along both sides and over the upper end of the relevant lifting column, and is driven by means of at least one cable, chain, belt or toothed belt by a motor with a reduction gear. Such a driving ensures a very readily controllable and smooth handling of the buckets. This control and smooth movement of the handling is less likely to be ensured with the use of hydraulic cylinders.

[0014] According to a final, though nevertheless important aspect of the invention, the device comprises a central control unit for controlling, with chosen mutual coordination and timing, the supply means, the driving of the first gripper, the scraper means, the transport means, the flushing means and the driving of the second gripper.

[0015] The invention will now be elucidated on the basis of the accompanying drawings of a random exemplary embodiment, to which the invention is not limited. In the drawings:

figure 1 shows a perspective view of a device according to the invention; and

figure 2 shows a schematic side view of the device according to the invention.

[0016] The two figures show a device 1 for automatically cleaning used and emptied paint buckets 2, each comprising a bottom 3, a body 4 with a mouth opening 5 and a curled mouth rim 6 extending around this mouth opening. Device 1 comprises:

an endless supply conveyor 7 for successively supplying one upright bucket 2 at a time;

a first lifting column 8 which connects with a first side to conveyor 7 and along which a first gripper 9 is displaceable up and downward on both sides and pivotable over the upper end 10 of first lifting column 8 from the one side to the other, and in reverse direction;

first positioning means 11 connecting to the second side of lifting column 8 for temporarily carrying one bucket 2 at a time in upside down position and hold-

ing it in position with some force;

scraper means 12 present under the first positioning means 11 for removing by means of a scraping operation at least a part of paint residues present on the inner surface of bucket 2;

a transport platform 13 connecting to the first positioning means 11;

a second lifting column 14 which connects with a first side to transport platform 13 and along which a second gripper 15 is displaceable up and downward on both sides and pivotable over the upper end 19 of second lifting column 14 from the one side to the other, and in reverse direction;

second positioning means 16 present on the first side of second lifting column 14 for carrying one bucket 2 at a time in upside down position and holding it in position with some force;

flushing means 17 present under the second positioning means 16 for removing by means of a flushing operation the last paint residues present on the inner surface of bucket 2; and

carrying means 18 connecting to the second side of the second lifting column for carrying one or a number of upright buckets 2 stacked onto each other in nested relation;

wherein successive buckets 2 supplied in upright position by supply conveyor 7 are gripped one at a time by the first gripper 9, displaced upward on the first side of first lifting column 8, tilted over the upper end 10 of first lifting column 8, displaced downward on the second side of first lifting column 8, placed on first positioning means 11 and there held fast by clamps 39, 40, subjected by scraper means 12 to a scraping operation, displaced upward by first gripper 9 to a chosen height, gripped by transport platform 13, displaced by this transport platform 13 to second gripper 15, gripped by this second gripper 15 and displaced downward and placed on second positioning means 16 and there held fast by clamps 41, 42, subjected to a flushing operation by flushing means 17, displaced upward along the first side of second lifting column 14 by second gripper 15, tilted over upper end 19 of second lifting column 14, displaced downward on the second side of second lifting column 14, and placed on carrying means 18 or in nested relation on a bucket 2 already placed on these carrying means 18 such as to form a stack 20 of cleaned, upright buckets 2 in nested relation.

[0017] Figure 1 shows that first gripper 9 comprises a fork 21 with two teeth 22, 23, which teeth have straight mutually parallel grooves 24, 25 on their surfaces directed toward each other such that mouth rim 6 of a bucket supplied by supply means 7 is pushed into these grooves 24, 25 and is thus gripped by first gripper 9.

[0018] Device 1 is further embodied such that transport platform 13 can support mouth rim 6 of a bucket 2 and can remove mouth rim 6 by a sliding displacement from grooves 24, 25.

[0019] The transport platform is provided for this pur-

pose with holding means for holding fast the mouth rim 6 of one bucket at a time. As the figures show, holding means 26 comprise four spring-loaded tongues 26 which extend out of the plane of platform 13 and together block the mouth rim 6 against displacement.

[0020] Figure 1 shows that in the shown exemplary embodiment the second gripper 15 comprises two clamping jaws 27, 28 movable toward and away from each other such that a bucket 2 supplied by transport means 13 can be engaged in each case on its body 4 or its mouth rim 6 by the two clamping jaws 27, 28 being moved towards each other, and can be released at the position of carrying means 18 by moving the clamping jaws 27, 28 apart. The displaceability of clamping jaws 27, 28 is indicated with arrows 36, 37.

[0021] The drawings further show that in the shown random exemplary embodiment the driving of first gripper 9 and/or the driving of second gripper 15 is of the type which comprises a carriage 29; 30 which bears the relevant gripper 9; 15 and which is guided along both sides and over the upper end of the relevant lifting column 8; 14, and is driven by means of at least one cable, chain, belt or toothed belt by a motor 31; 32 with a reduction gear 33; 34.

[0022] The drawings do not show that the device is preferably provided with a central control unit for controlling, with chosen mutual coordination and timing, the supply means 7, the driving 31 of first gripper 9, scraper means 12, transport means 13, flushing means 17 and the driving 32 of second gripper 15.

[0023] Attention is drawn to the fact that figure 2 shows a schematic representation of device 1. The displacement of a bucket 2 through device 1 is shown with arrows, all designated 38 for the sake of convenience.

[0024] Figure 2 shows that in this exemplary embodiment the carrying means 18 are embodied as a pallet, which can for instance be lifted by a forklift truck for the purpose of displacing the stack 20 of buckets 2 carried thereby.

[0025] Attention is drawn to the fact that scraper means 12 and flushing means 17 are only shown schematically. These are per se generally known and do not as such form part of the invention, which is after all related to a device which is designed to perform a specific, systematic sequential treatment of paint buckets for the purpose of cleaning thereof in very simple and effective manner.

[0026] With a view to safety, the device is preferably provided with a housing. This is not shown in the drawings.

Claims

1. Device (1) for automatically cleaning used and emptied paint buckets (2), each comprising a bottom (3), a body (4) with a mouth opening (5) and a curled mouth rim (6) extending around this mouth opening, which device (1) comprises:

optional supply means (7) for successively supplying one upright bucket (2) at a time;

a first lifting column (8) which connects with a first side to the optional supply means (7) and along which a first gripper (9) is displaceable up and downward on both sides and is pivotable over the upper end (10) of the first lifting column (8) from the one side to the other and in reverse direction;

first positioning means (11) connecting to the second side of the lifting column (8) for temporarily carrying one bucket (2) at a time in upside down position and holding it in position with some force;

scraper means (12) present under the first positioning means (11) for removing by means of a scraping operation at least a part of paint residues present on the inner surface of the bucket (2);

transport means (13) connecting to the first positioning means (11);

a second lifting column (14) which connects with a first side to the transport means (13) and along which a second gripper (15) is displaceable up and downward on both sides and is pivotable over the upper end (19) of the second lifting column (14) from the one side to the other and in reverse direction;

second positioning means (16) present on the first side of the second lifting column (14) for carrying one bucket (2) at a time in upside down position and holding it in position with some force;

flushing means (17) present under the second positioning means (16) for removing by means of a flushing operation the last paint residues present on the inner surface of the bucket (2); and

carrying means (18) connecting to the second side of the second lifting column for carrying one or a number of upright buckets (2) stacked onto each other in nested relation;

wherein successive buckets (2) supplied in upright position by the supply means (7) are gripped one at a time by the first gripper (9), displaced upward on the first side of the first lifting column (8), tilted over the upper end (10) of the first lifting column (8), displaced downward on the second side of the first lifting column (8), placed on the first positioning means (11), subjected by the scraper means (12) to a scraping operation, displaced upward by the first gripper (9) to a chosen height, gripped by the transport means (13), displaced by these transport means (13) to the second gripper (15), gripped by this second gripper (15) and displaced downward and placed on the second positioning means (16), subjected to a flushing operation by the

- flushing means (17), displaced upward along the first side of the second lifting column (14) by the second gripper (15), tilted over the upper end (19) of the second lifting column (14), displaced downward on the second side of the second lifting column (14), and placed on the carrying means (18) or in nested relation on a bucket (2) already placed on these carrying means (18) such as to form a stack (20) of cleaned, upright buckets (2) in nested relation.
2. Device (1) as claimed in claim 1, wherein the supply means comprise an endless conveyor (7).
3. Device (1) as claimed in claim 1, wherein the first gripper (9) comprises a fork (21) with two teeth (22, 23), which teeth have straight mutually parallel grooves (24, 25) on their sides directed toward each other such that the mouth rim (6) of a bucket supplied by the supply means (7) is pushed into these grooves (24, 25) and is thus gripped by the first gripper (9).
4. Device (1) as claimed in claim 3, wherein the transport means (13) can support the mouth rim (6) of a bucket (2) and can remove the mouth rim (6) by a sliding displacement from the grooves (24, 25).
5. Device (1) as claimed in claim 4, wherein the transport means (13) comprise a platform (13) which is displaceable reciprocally between the first lifting column (5) and the second lifting column (14) and which is provided with holding means (26) for fixedly holding the mouth rim (6) of one bucket (2) at a time.
6. Device (1) as claimed in claim 5, wherein the holding means (26) comprise a number of spring-loaded tongues (26) extending out of the plane of the platform (13).
7. Device (1) as claimed in any of the foregoing claims, wherein the second gripper (15) comprises two clamping jaws (27, 28) movable toward and away from each other such that a bucket (2) supplied by the transport means (13) can be engaged in each case on its body (4) or its mouth rim (6) by the two clamping jaws (27, 28) being moved toward each other, and can be released at the position of the carrying means (18) by moving the clamping jaws (27, 28) apart.
8. Device (1) as claimed in any of the foregoing claims, wherein the driving of the first gripper (9) and/or the driving of the second gripper (15) is of the type which comprises a carriage (29; 30) which bears the relevant gripper (9; 15) and which is guided along both sides and over the upper end of the relevant lifting column (8; 14), and is driven by means of at least one cable, chain, belt or toothed belt by a motor (31);

32) with a reduction gear (33; 34).

9. Device (1) as claimed in any of the foregoing claims, comprising a central control unit for controlling, with chosen mutual coordination and timing, the supply means (7), the driving (31) of the first gripper (9), the scraper means (12), the transport means (13), the flushing means (17) and the driving (32) of the second gripper (15).

Patentansprüche

1. Vorrichtung (1) zum automatischen Reinigen von benutzten und geleerten Farbeimern oder -Behältern (2), die jeweils einen Boden (3), einen Hauptteil (4) mit einer Mündungsöffnung (5) und einen gewellten Mündungsrand (6) aufweisen, der sich um diese Mündungsöffnung erstreckt, welche Vorrichtung (1) aufweist:

optionale Zuführmittel (7) zum aufeinander folgenden Zuführen von jeweils einem aufrecht stehenden Behälter (2) zur Zeit;

eine erste Anhebesäule (8), die mit einer ersten Seite der optionalen Zuführmittel (7) verbunden ist und entlang derer ein erstes Greifelement (9) nach oben und nach unten auf beiden Seiten verschiebbar und über das obere Ende (10) der ersten Anhebesäule (8) von der einen Seite zur anderen Seite und in umgekehrter Richtung schwenkbar ist;

erste Positioniermittel (11), die mit der zweiten Seite der Anhebesäule (8) zum zeitweiligen Tragen eines Behälters (2) zur Zeit in Kopfüberstellung und ihn mit einiger Kraft in dieser Stellung zu halten verbinden;

Schabermittel (12), die unter den ersten Positioniermitteln (11) zum Entfernen wenigstens eines Teils der Farbreste mithilfe eines Schabbertriebs vorhanden sind, die auf der inneren Oberfläche des Behälters (2) vorhanden sind;

Transportmittel (13), die mit den ersten Positioniermitteln (11) verbunden sind;

eine zweite Anhebesäule (14), die mit einer ersten Seite der Transportmittel (13) verbunden ist und entlang derer ein zweites Greifelement (15) nach oben und nach unten auf beiden Seiten verschiebbar und über das obere Ende (19) der zweiten Anhebesäule (14) von der einen Seite zur anderen Seite und in umgekehrter Richtung schwenkbar ist;

zweite Positioniermittel (16), die auf der ersten Seite der zweiten Anhebesäule (14) vorhanden sind, um einen Behälter (2) zur Zeit in Kopfüberstellung zu tragen und ihn in dieser Stellung mit einiger Kraft zu halten;

Spülmittel (17), die unter den zweiten Positio-

- niermitteln (16) vorhanden sind, um mithilfe eines Spülbetriebs die letzten Farbreste zu entfernen, die auf der inneren Oberfläche des Behälters (2) vorhanden sind; und
- Tragmittel (18), die mit der zweiten Seite der zweiten Anhebesäule verbunden sind, um einen oder eine Anzahl von aufrecht stehenden Behältern (2) ineinander gestapelt in verschachtelter Beziehung zu tragen;
- wobei aufeinander folgende Behälter (2), die in aufrechter Stellung durch die Zuführmittel (7) zugeführt werden, einzeln durch die ersten Greifelemente (9) ergriffen werden, auf der ersten Seite der ersten Anhebemittel (8) nach oben verschoben werden, über das obere Ende (10) der ersten Anhebesäule (8) gekippt werden, auf der zweiten Seite der ersten Anhebesäule (8) nach unten verschoben werden, auf den ersten Positioniermitteln (11) angeordnet werden, den Schabmitteln (12) für einen Schabbetrieb ausgesetzt werden, nach oben durch die ersten Greifelemente (9) zu einer vorgewählten Höhe verschoben werden, durch die Transportmittel (13) ergriffen werden, durch diese Transportmittel (13) zu das zweiten Greifelement (19) verschoben werden, durch dieses zweite Greifelement (15) ergriffen werden und nach unten verschoben und auf den zweiten Positioniermitteln (16) angeordnet werden, einem Spülbetrieb durch die Spülmittel (17) ausgesetzt werden, nach oben entlang der ersten Seite der zweiten Anhebesäule (14) durch die zweiten Greifelemente (15) verschoben werden, über das obere Ende (19) der zweiten Anhebesäule (14) gekippt werden, nach unten auf der zweiten Seite der zweiten Anhebesäule (14) verschoben werden und auf den Tragmitteln (18) oder in verschachtelter Beziehung auf einem Behälter (2) angeordnet werden, der bereits auf diesen Tragmitteln (18) angeordnet ist, um so einen Stapel von gereinigten aufrecht stehenden Behältern (2) in verschachtelter Beziehung zu bilden.
2. Vorrichtung (1) nach Anspruch 1, bei der die Zuführmittel einen Endlosförderer (7) aufweisen.
 3. Vorrichtung (1) nach Anspruch 1, bei der das erste Greifelement (9) eine Gabel (21) mit zwei Zähnen (22, 23) aufweist, welche Zähne zueinander parallele Nuten (24, 25) auf ihren Seiten aufweisen, die aufeinander zu gerichtet sind, so dass der Mündungsrand (6) eines Behälters, der durch die Zuführmittel (7) zugeführt wird, in diese Nuten (24, 25) gestoßen wird und so durch das erste Greifelement (9) ergriffen wird.
 4. Vorrichtung (1) nach Anspruch 3, bei der die Transportmittel (13) den Mündungsrand (6) eines Behälters (2) tragen können und den Mündungsrand (6) durch eine gleitende Verschiebung von den Nuten (24, 25) entfernen können.
 5. Vorrichtung (1) nach Anspruch 4, bei der die Transportmittel (13) eine Plattform (13) aufweisen, die zwischen der ersten Anhebesäule (5) und der zweiten Anhebesäule (14) hin- und herverschiebbar ist und die mit Haltemitteln (26) zum festen Halten des Mündungsrandes (6) eines Behälters (2) zur Zeit versehen ist.
 6. Vorrichtung (1) nach Anspruch 5, bei der die Haltemittel (26) eine Anzahl von federbelasteten Zungen (26) aufweisen, die sich aus der Ebene der Plattform (13) erstrecken.
 7. Vorrichtung (1) nach einem der vorangehenden Ansprüche, bei der das zweite Greifelement (15) zwei Klemmklaue (27, 28) aufweist, die aufeinander zu und voneinander weg bewegbar sind, so dass ein Behälter (2), der durch die Transportmittel (13) zugeführt wird, in jedem Falle an seinem Hauptteil (4) oder seinem Mündungsrand (6) durch die zwei Klemmklaue (27, 28), die aufeinander zu bewegt werden, ergriffen werden kann, und an der Position der Tragmittel (18) freigegeben werden kann, indem die Klemmklaue (27, 28) voneinander weg bewegt werden.
 8. Vorrichtung (1) nach einem der vorangehenden Ansprüche, bei der der Antrieb der ersten Greifelemente (9) und/oder der Antrieb der zweiten Greifelemente (15) von dem Typ ist, der einen Wagen (29, 30) aufweist und der das entsprechende Greifelement (9, 15) trägt und entlang beiden Seiten und über das obere Ende der entsprechenden Anhebesäule (8, 14) geführt wird und mithilfe von wenigstens einem Kabel, einer Kette, einem Band oder einem verzahnten Band durch einen Motor (31, 32) mit einem Reduktionsgetriebe (33, 34) angetrieben wird.
 9. Vorrichtung (1) nach einem der vorangehenden Ansprüche, die eine zentrale Steuereinheit zum Steuern mit gewählter gegenseitiger Koordination und gewähltem Zeitablauf der Zuführmittel (7), des Antriebs (31) des ersten Greifelementes (9), der Schabmittel (12), der Transportmittel (13), der Spülmittel (17) und des Antriebs (32) des zweiten Greifelementes (15) aufweist.

Revendications

1. Dispositif (1) destiné à nettoyer automatiquement des seaux de peinture usagés et vidés (2), chacun comportant un fond (3), un corps (4) avec une ouverture d'embouchure (5) et un rebord d'embouchure

retourné (6) s'étendant autour de cette ouverture d'embouchure, lequel dispositif (1) comporte :

des moyens d'avance optionnels (7) destinés à avancer de manière successive un seau vertical (2) à la fois ;
 une première colonne de soulèvement (8) qui se raccorde à un premier côté des moyens d'avance optionnels (7) et le long de laquelle un premier organe de saisie (9) peut être déplacé vers le haut et vers le bas des deux côtés et peut pivoter par-dessus l'extrémité supérieure (10) de la première colonne de soulèvement (8) du premier côté vers l'autre et dans le sens inverse ;
 des premiers moyens de positionnement (11) se raccordant au deuxième côté de la première colonne de soulèvement (8) afin de transporter temporairement un seau (2) à la fois dans une position la tête en bas et en le maintenant en position avec une certaine force ;
 des moyens de grattage (12) présents sous les premiers moyens de positionnement (11) afin d'enlever au moyen d'une opération de grattage au moins une partie des résidus de peinture présents sur la surface intérieure du seau (2) ;
 des moyens de transport (13) se raccordant aux premiers moyens de positionnement (11) ;
 une deuxième colonne de soulèvement (14) qui se raccorde à un premier côté des moyens de transport (13) et le long de laquelle un deuxième organe de saisie (15) peut être déplacé vers le haut et vers le bas des deux côtés et peut pivoter par-dessus l'extrémité supérieure (19) de la deuxième colonne de soulèvement (14) du premier côté vers l'autre et dans le sens inverse ;
 des deuxièmes moyens de positionnement (16) présents sur le premier côté de la deuxième colonne de soulèvement (14) afin de transporter un seau (2) à la fois dans une position la tête en bas et en le maintenant en position avec une certaine force ;
 des moyens de rinçage (17) présents sous les deuxièmes moyens de positionnement (16) afin d'enlever au moyen d'une opération de rinçage au moins les derniers résidus de peinture présents sur la surface intérieure du seau (2) ; et
 des moyens de transport (18) se raccordant au deuxième côté de la deuxième colonne de soulèvement afin de transporter un ou plusieurs seaux verticaux (2) empilés l'un sur l'autre en relation emboîtée ;
 des seaux (2) successifs délivrés en position verticale par les moyens d'avance (7) étant saisis un à la fois par le premier organe de saisie (9), déplacés vers le haut sur le premier côté de la première colonne de soulèvement (8), basculés par-dessus l'extrémité supérieure (10) de la

première colonne de soulèvement (8), déplacés vers le bas sur le deuxième côté de la première colonne de soulèvement (8), placés sur les premiers moyens de positionnement (11), soumis par les moyens de grattage (12) à une opération de grattage, déplacés vers le haut par le premier organe de saisie (9) jusqu'à une hauteur choisie, saisis par les moyens de transport (13), déplacés par ces moyens de transport (13) jusqu'au deuxième organe de saisie (15), saisis par ce deuxième organe de saisie (15) et déplacés vers le bas et placés sur les deuxièmes moyens de positionnement (16), soumis à une opération de rinçage par les moyens de rinçage (17), déplacés vers le haut le long du premier côté de la deuxième colonne de soulèvement (14) par le deuxième organe de saisie (15), basculés par-dessus l'extrémité supérieure (19) de la deuxième colonne de soulèvement (14), déplacés vers le bas sur le deuxième côté de la deuxième colonne de soulèvement (14), et placés sur les moyens de transport (18) ou en relation emboîtée sur un seau (2) déjà placé sur ces moyens de transport (18) de façon à former une pile (20) de seaux verticaux nettoyés (2) en relation emboîtée.

2. Dispositif (1) selon la revendication 1, dans lequel les moyens d'avance comportent un transporteur dans fin (7).
3. Dispositif (1) selon la revendication 1, dans lequel le premier organe de saisie (9) comprend une fourche (21) avec deux dents (22, 23), lesquelles dents ont des rainures droites mutuellement parallèles (24, 25) sur leurs côtés orientés l'un vers l'autre de telle sorte que le rebord d'embouchure (6) d'un seau délivré par les moyens d'avance (7) est poussé dans ces rainures (24, 25) et est ainsi saisi par le premier organe de saisie (9).
4. Dispositif (1) selon la revendication 3, dans lequel les moyens de transport (13) peuvent supporter le rebord d'embouchure (6) d'un seau (2) et peuvent enlever le rebord d'embouchure (6) des rainures (24, 25) par un déplacement coulissant.
5. Dispositif (1) selon la revendication 4, dans lequel les moyens de transport (13) comprennent une plateforme (13) qui peut être déplacée en va-et-vient entre la première colonne de soulèvement (5) et la deuxième colonne de soulèvement (14) et qui est pourvue de moyens de maintien (26) destinés à maintenir de façon fixe le rebord d'embouchure (6) d'un seau (2) à la fois.
6. Dispositif (1) selon la revendication 5, dans lequel les moyens de maintien (26) comprennent plusieurs

languettes chargées par ressort (26) s'étendant hors du plan de la plateforme (13).

7. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le deuxième organe de saisie (15) comprend deux mâchoires de serrage (27, 28) mobiles vers et à l'écart l'un de l'autre de telle sorte qu'un seau (2) délivré par les moyens de transport (13) peut être engagé dans chaque cas sur son corps (4) ou son rebord d'embouchure (6) par les deux mâchoires de serrage (27, 28) qui sont déplacées l'une vers l'autre, et peut être libéré dans la position des moyens de transport (18) en écartant les mâchoires de serrage (27, 28).

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8. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel l'entraînement du premier organe de saisie (9) et/ou l'entraînement du deuxième organe de saisie (15) est du type qui comprend un chariot (29 ; 30) qui supporte l'organe de saisie (9 ; 15) concerné et qui est guidé le long des deux côtés et par-dessus l'extrémité supérieure de la colonne de soulèvement (8 ; 14) concernée, et est entraîné au moyen d'au moins un câble, une chaîne, une courroie ou une courroie crantée par un moteur (31 ; 32) avec un pignon de réduction (33 ; 34).

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9. Dispositif (1) selon l'une quelconque des revendications précédentes, comportant une unité de commande centrale destinée à commander, avec une coordination et une temporisation mutuelles choisies, les moyens d'avance (7), l'entraînement (31) du premier organe de saisie (9), les moyens de grattage (12), les moyens de transport (13), les moyens de rinçage (17) et l'entraînement (32) du deuxième organe de saisie (15).

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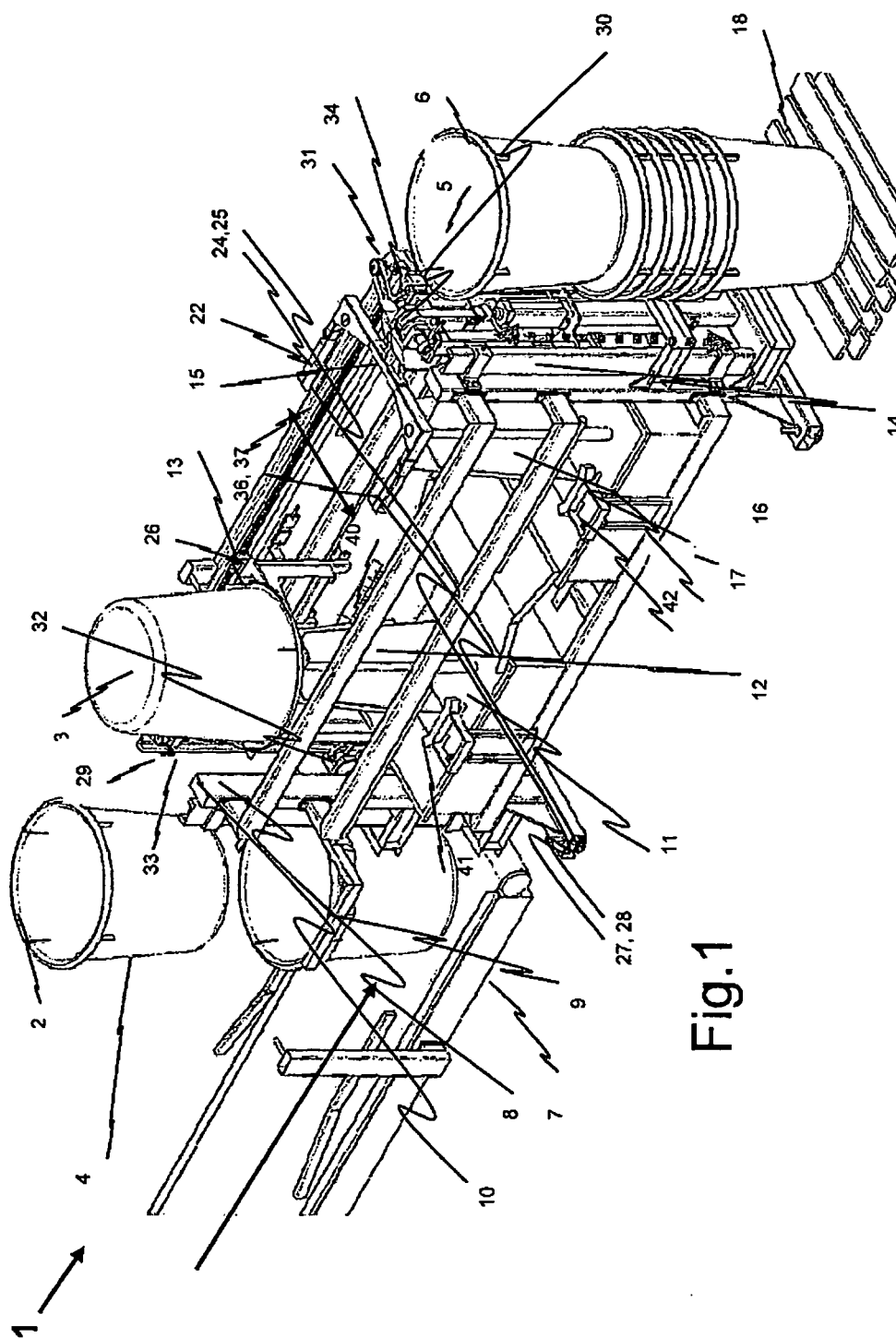


Fig.1

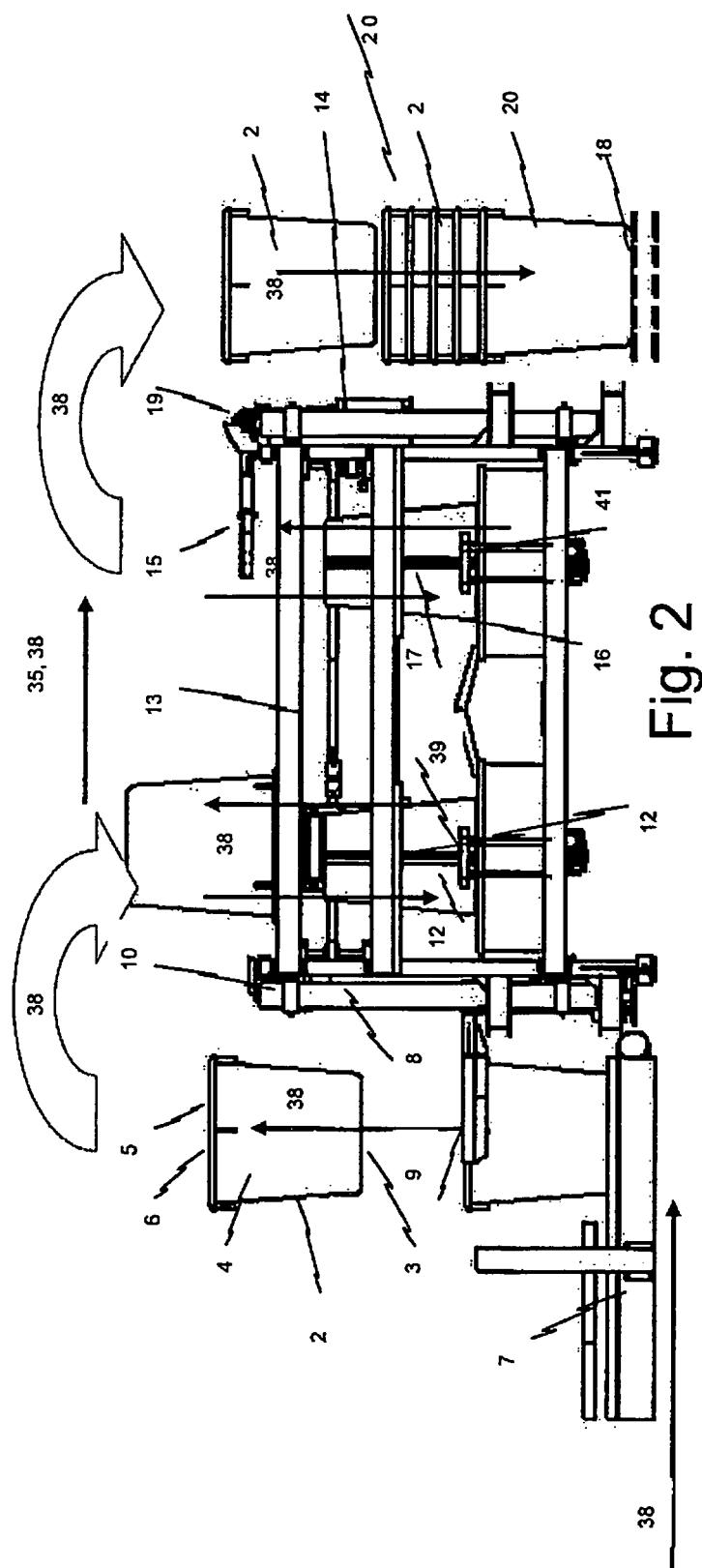


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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