PROCEEDURE AND DEVICE FOR CLEANING FLOORS WITH FLAT CLEANING MOPS

Abstract: In a procedure for cleaning floors by hand with the help of flat cleaning mops, mops provided with a certain quantity of cleaning solution are used. In this case, at least one mop is removed from a storage container (1), and saturated with solution before or during removal; the solution is applied onto the surface of the mop; the mops are stored as is after use in a holding container (2) up to their disposal for purposes of regeneration. A device for fitting and preparing a larger number of flat cleaning mops consists of a storage container, which has a removal opening (5) for removing mops, and is provided inside with a feeding device (11) for prior saturating the removed mops with cleaning solution.
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PROCEDURE AND DEVICE FOR CLEANING FLOORS
WITH FLAT CLEANING MOPS

The invention relates to a procedure for cleaning floors by hand with the help of flat cleaning mops, wherein mops provided with a certain quantity of cleaning solution are used.

This procedure is carried out on large surfaces by means of a device for supplying and preparing flat cleaning mops with a storage container, which stores a larger number of mops.

The use of flat cleaning mops, so called flat mops, in cleaning technology is very widespread. Flat mops are used in particular on floors that need to be cleaned by hand, e.g., in laboratories, hospitals, production facilities with high demands on purity and cleanliness, e.g., in computer technology, chip manufacture, medical technology, and the like.

Flat mops have the advantage of covering a large floor surface area, wherein the operator can easily check the result. One special advantage lies in the fact that the used flat mop need only be replaced by a fresh one at the latest when the cleaning solution applied to the fresh flat mop has been used up. The precondition for achieving a high standard of cleaning is that the operator does not have to rinse, wring and again saturate the flat mop, as is usually the case.

As a result, this invention proceeds from the knowledge that the mop replacement principle is to replace on-site mop cleaning, i.e., the used mop, whose cleaning solution has been used up, is replaced by a fresh mop saturated with fresh cleaning solution. The cleaning solution is to be applied to a fresh mop in the dosage needed for the desired cleaning result.

To ensure a suitable dosage, it is already known from EP 90850020 B1 to pack a cleaning mop in a sealed cover, which
also encompasses a sealed container with cleaning solution, so that the liquid is separate from the mop, and the container can be opened without tearing open the cover, so that the liquid flows out inside the cover, and saturates the mop. After use, the mop is taken to the washing plant, where it is washed and packed in a new cover for reuse in the manner described.

Also known from US 4174977 is to have a conventional cleaning cart with rinsing bucket, mop press and waste container incorporate a metering device, which makes it possible to saturate the mop rinsed and dry-pressed for reuse with a selectable quantity of fresh cleaning solution. Metering device operation is valve-controlled, wherein a settable quantity of cleaning solution is diverted from a storage container and applied by means of a swiveling dispensing tube onto the mop bundled in a bucket, which consists of a bundle of mop element skeins. This type of metering device is unsuitable for flat mops, since it cannot be used to achieve a uniform distribution of cleaning solution. In addition, bundled mops are less suitable for the reliable performance of cleaning jobs where high demands are placed on the cleaning result.

By contrast, the object of this invention is to create a procedure and device of the kind mentioned at the outset for cleaning floor surfaces that not only satisfy the highest demands on cleaning quality; in particular, the goal is to support an environment-friendly, cost-effective cleaning procedure with a suitable device that does not require renewed on-site reparation of the cleaning mop.

This object is achieved in the procedure according to a first embodiment of the invention in that at least one mop is removed from a storage container, that the mops are saturated with solution before or during removal and that the solution is applied onto the surface of the mop.
The procedure of the first embodiment of the invention can be advantageously supported by means of a suitable device for fitting and preparing flat cleaning mops with a storage container, which stores a larger number of mops, has a removal opening for removing mops, and is provided inside with a feeding device for prior saturating the removed mops with cleaning solution.

This object is also achieved in the procedure according to a second embodiment of the invention in that at least one mop is removed from a storage container, that the mops are saturated with solution at removal and that the solution is applied onto the surface of the mop.

Furthermore, this object is achieved in the procedure according to a third embodiment of the invention in that at least one mop is removed from a storage container, that the mops are saturated with solution after removal and that the solution is applied onto the surface of the mop. This enables a user to remove a dry mop from the device, which may be saturated with solution after removal.

The procedures of the second and third embodiments of the invention can be advantageously supported by means of a suitable device for fitting and preparing flat cleaning mops with a storage container, which stores a larger number of mops and has a removal opening for removing mops, which device is provided with a feeding device for saturating the mops with cleaning solution.

In addition to at least one storage container, the device according to the invention advantageously encompasses at least one holding container, which accommodates the dirty mops following their use.
The procedure and device according to the invention provide, as it were, a novel way for mastering cleaning jobs involving large surfaces, e.g., of the kind handled in particular by large companies in the cleaning industry, and for which the solution proposed by the invention is therefore of special interest. Because the device according to the invention makes it possible to automatically control how much cleaning solution is metered per mop, requirements for an elevated cleaning quality can be harmonized in an ideal fashion with those for an economical utilization of resources. A suitable metering of cleaning solution makes it possible to adjust the quantity of cleaning solution applied per unit area of the floor surface to be cleaned in a highly reliable and accurate manner; at the same time, this sets the consumption of fresh water and cleansing agent. In comparison to the conventional, individual metering based on cleaning power, an economical use of cleaning agent can therefore also be generally achieved. The fact that the used mops are not washed on-site, but instead collected and washed in a large number at a washing plant, eliminates additional problems involving the disposal of dirty water. This means that fresh water is not used at the cleaning site, and nor must dirty water be removed. Therefore, an economic cost calculation can advantageously be based either on the cleaned surface or number of used mops. This makes it possible to calculate very precisely the financial burden placed on the customer for the "cleaning" service while still ensuring cleaning quality.

The cleaning system proposed by the invention, which is based on the use of flat mops and their exchange, is particularly suitable for use in franchise systems, which are suitably organized to perform cleaning services on-site and maintain a system for supplying fresh flat mops and disposing of dirty flat mops. This activity centers around the device according to the invention, which the franchise sets up in the number required at the customer, and there fits it with fresh flat mops, whose metering device must be serviced accordingly, and
which can have a holding container for keeping the used mops, whose contents must be disposed of.

According to the first embodiment of the invention the mops are advantageously fanned out and stacked one on top of the other in a storage container of the device according to the invention. In this case, either only the mop removed from the stack, e.g., the top mop, is saturated with solution, wherein the remaining stack remains essentially dry, or several mops are moistened simultaneously, if used simultaneously or in rapid succession.

In the first embodiment of the invention the mops are advantageously saturated with cleaning solution by spraying the mops with the solution until saturated. As an alternative, the mops can be saturated through immersion in a corresponding bath with cleaning solution.

For saturation purposes, the mops are removed from the stack of fresh flat mops in the storage container, preferably from the top, by first saturating the uppermost or lowermost mop of the stack with cleaning solution and then removing it. Another possibility is to remove the respective top mop of the stack and only then saturating it with solution in the direction taken off behind the stack. In this variant, the stack remains completely dry. Saturation can either take place by spraying immediately before removal, or drawing the mop through a bath filled with solution. To ensure a uniform saturation of the mop, it makes sense for the removal of the mop from the storage container to be automatically controlled.

The device according to the invention can be configured to have a metering device that routes an adjustable quantity of solution to the feeding device from a tank with fresh cleaning solution. In the first embodiment of the invention the
feeding device is advantageously designed as a spraying device.

In another proposal according to the first embodiment of the invention, the storage container has a removal opening in the front, under which is located the stack with fresh mops, and above which the feeding device is accommodated. In this case, it makes sense for an intermediate floor in the storage container to be adjustable in height based on the stack height, which diminishes as the mops stacked in the magazine are removed. The height of the intermediate floor can here be incrementally adjusted, wherein the height is adjusted by about the thickness of one mop in each increment.

In addition, actuation of the metering device can be linked with each height adjustment, so that the respectively removed mop or the uppermost mop of the stack is saturated with solution. As already stated above, this can either take place while the uppermost mop is still on the stack, or only after the uppermost mop has been taken off the stack.

Instead of a height-adjustable intermediate floor, the stack can rest on a fixed decking, wherein the removal opening adjusts to the stack height.

As concerns the structure of the storage container, the invention according to the first embodiment provides that the feeding device consists of spray nozzles distributed over the container cross section, which are connected to the metering device by a system of lines.

In one advantageous configuration of the metering device, the latter is situated with the tank for the cleaning solution and a compressed air bottle to convey the solution by means of compressed air to the feeding device in a separate casing.
For purposes of maintaining the device according to the invention, it makes sense that its storage and holding container each have a lid section that can be swing open to the side on hinges. Unlatching and tilting the lid makes it easy to both refill the storage container with fresh mops, and remove the dirty mops from the holding container.

In an advantageous form of execution of the invention, the magazine with stack of fresh flat mops is located inside the storage container, specifically above the intermediate floor, wherein the stack is bounded on the sides by vertical guide rods.

The height of the intermediate floor is advantageously adjusted by a spring force, exerted by the removal of the stack weight or through the use of an upper stop. Tension and/or compression springs that act on the intermediate floor are here used.

The storage container preferably has a drip floor below the stack for cleaning solution released to the sides of the stack, which can be returned for reuse. It makes sense to use a drain to connect the drip floor with a collecting basin provided in the lower part of the storage container.

According to the second embodiment of the invention the feeding device is formed as a flat trough, which preferably comprises a perforated flexible upper plate and a stiff lower plate appropriate to support the flexible upper plate. The stiff lower plate is arranged underneath the perforated flexible upper plate with a small distance, such that, upon sufficient elastic deformation of the flexible upper plate, the flexible upper plate may abut against the stiff lower plate. In absence of a sufficient elastic deformation of the flexible upper plate to abut against the stiff lower plate, an intermediate space between the perforated flexible upper plate and the stiff lower plate is formed, which may be at
least partly filled with cleaning solution. Thus, upon elastic deformation of the flexible upper plate, by exerting a mechanical force on the flexible upper plate for instance by means of a rod, the flexible upper plate sinks into the cleaning solution, and, in case that a mop is placed onto the surface of the flexible upper plate, that mop will also sink into the cleaning solution.

In an advantageous embodiment of the invention the stiff lower plate may advantageously be perforated, such that the trough or the intermediate space between upper and lower plates, respectively, may be filled with cleaning solution from below the perforated stiff plate.

According to the second and third embodiments of the invention it is preferable that the storage container is formed as a rotatable drum having a plurality of radially arranged compartments. In then makes sense that the dimensions of each compartment correspond roughly to the dimensions of a fanned out mop, so that each compartment may be filled with a single mop. It may also be convenient to provide for single compartments suitable for filling with a plurality of mops, which may then be arranged in parallel.

It is preferred that the removal opening for removing mops from the storage container is formed in a fixed casing of the drum, wherein the removal opening is arranged in a position underneath a horizontal plane passing through the center of the drum, and wherein an aperture of the removal opening corresponds roughly to an aperture of the radially arranged compartments. Such arrangement of the removal opening results in, that the mops will drop out of the compartments by gravitation in case the removal opening releases said aperture of the respective compartment. In order to bring each compartment in a position, in which its aperture is released by the removal opening, the drum may advantageously be rotated step-
wise, such that one step of rotation corresponds to the rotational increment between adjacent compartments.

The device may advantageously further comprise a guide plate arranged at the removal opening for guiding the mops to a removal position in the trough. In other words, in case the removal opening releases a respective compartment, which results in that the corresponding mop will drop out of the compartment, the mop is led to the trough into a position, in which it can be easily removed by a user.

The device according to the second and third embodiments of the invention may also comprise a filling opening for filling mops in the storage container, which is formed in a fixed casing of the drum, wherein the filling opening is arranged in a position above a horizontal plane passing through the center of the drum, such that mops filled into the compartment will drop into the compartments by gravitation. In order to quickly fill the storage container, an aperture of the filling opening corresponds roughly to a plurality of apertures of the radially arranged compartments, such that a plurality of compartments may be filled simultaneously.

According to the second and third embodiments of the invention the mops are advantageously fanned out and placed in the compartments of the drum. In case a respective compartment is released by the removal opening, only that mop will drop out of the compartment and will be saturated with solution, wherein the remaining mops stay dry. For a secure removal of the mops from the compartments a mop sliding face of each compartment, on which a mop will slide out of the compartment, may advantageously be polished.

For saturation purposes, the mops drop out from its respective compartment and are brought into a removal position, in which they are fanned out horizontally, which removal position is accessible from outside. It is advantageous that each
mop is brought into a removal position with a downward oriented cleaning face.

According to a most preferred variant of the second embodiment of the invention each mop drops out of its respective compartment upon release by the removal opening, is led to the perforated flexible upper plate having its cleaning face downward oriented and is saturated with solution at its removal by sinking it into a stock of cleaning solution by exerting a sufficient mechanical force on the mop such, that the flexible upper plate is elastically deformed until it contacts the stiff lower plate.

The device according to the invention can be configured to have a metering device that routes an adjustable quantity of solution to the feeding device from a tank with fresh cleaning solution, such that each mop may be saturated with a metered quantity of the solution.

In another advantageous configuration of the invention, the removal opening of the storage container is sealed form outside by means of a flap, which, when opened, actuates the metering device, whose subsequent actuation is disabled until the saturated mop has been removed. This ensures that the same mop cannot be moistened over and over again simply by opening the flap. The flap can also be provided with a lock, so that it additionally serves as a safety element when the device is not in use.

In order to reliably prevent already used mops given an empty magazine from again being taken from the holding container, the invention also provides that the holding container have a feed inlet on its lid section that is bridged to the inside by a deflection compartment, which prevents a hand from reaching in. The deflection compartment also enables a better utilization of space for the holding container.
According to the invention, up to 50 or even up to 100 fresh mops can be stored in a dry state without any problem. Based on a cleaned floor surface per mop of 20 m², for example, this yields a savings of approx. $2.00 per liter of used cleaning solution in favor of the cleaning system according to the invention, calculated according to the statistical data valid in the U.S. In terms of the U.S. national economy, this denotes an overall savings of approx. 800 million dollars per year. These savings can essentially be attributed to the ability to precisely, and hence economically, meter the cleaning solution per mop, the surface coverage per mop depending on the cleaning job, and the rational maintenance, fitting and disposal of the device components according to the invention used in the process.

In the device according to the invention storage and holding containers are advantageously set up one next to the other on the casing for the metering device. The casing can be mounted on wheels, so that the operator can bring it along. This minimizes the time required to change out the mop.

In all embodiments of the invention it of course is possible to remove dry mops from the device for instance for the purpose of dust cleaning or spill removal. The term "cleaning" of floors as used herein comprises cleaning, treatment and disinfection of floors.

The invention shall now be described based on respective examples of the first and second embodiments of the invention.

Fig. 1 shows a diagrammatic view of an exemplary device according to the first embodiment of the invention. Fig. 2 shows a diagrammatic view of an exemplary device according to the second embodiment of the invention.

The device shown in Fig. 1 has a holding container 2 in addition to a storage container 1 for fitting and preparing flat
mops. Both containers are mounted on a casing 3 that can be moved on rollers 4. Situated inside the storage container 1 with the removal opening 5 is a magazine with a stack 6 of flat mops, which are stacked on an intermediate floor 7. Vertically running guide rods secured to the respective interior walls of the storage container 1 for limiting the stack 6 housed in the magazine to the side have not been shown to maintain the clarity of the drawing. Visible under the intermediate floor 7 is the symbolic representation of a compression spring 8, which incrementally shifts the intermediate floor upward in response to the continuous removal of flat mops according to arrows 9 through the removal opening 5. Situated over the floor of the storage container 1 is a drip floor 10, which is used to catch and divert any cleaning solution that was released, i.e., not absorbed by the upper mop. The cleaning solution is sprayed onto the upper mop by means of a feeding device 11, which has nozzles uniformly distributed over the entire cross section of the storage container 1. The removal opening 5 of the storage container 1 can be sealed by the flap 12 denoted by a dashed line. The operator opens the flap 12 to grasp the uppermost flat mop in the magazine, simultaneously opens the flap to actuate the metering device, which deactivates before or while the mop is removed through the removal opening 5. The metering device is located in casing 3, in which a tank 13 with cleaning solution and a pressure tank 14 are accommodated. A valve-controlled conveying system (not shown) connects the pressure tank, e.g., containing 60 psi of compressed air, with the tank 13, and from there with the feeding device 11 via a hose connection. The lid 15 of the casing 3 is shown folded down in the open position.

The tank 13 with the cleaning solution has a capacity of 30 l, for example. This is enough to saturate approx. 100 mops.

The storage container 1 contains a magazine preferably having 50 to 100 mops stacked one atop the other. The magazine is
filled by swiveling open the lid 16 of the storage container 1 around the hinge 18 according to arrow 17.

The holding container 2 also has a lid section 20 that can be swiveled around the hinges 18 according to arrow 18, which accommodates the feed inlet 21. The dirty mops to be disposed of according to arrows 22 are laterally inserted into the holding container 2, passing by a deflection compartment 23, and then drop down into the holding container 2. The storage container 1 and holding container 2 are bonded together, and underneath with the casing 3, by means of bracket joints 24.

The device shown in Fig. 2 has a storage container, which is formed as a drum 25, provided with a plurality of radially arranged compartments 26. Drum 25, which is placed in a horizontal plane 27 passing through the center 28 of the drum 25, is accommodated in a fixed casing 30, which is mounted on wheels 50. A filling opening 29 for filling mops into the drum 25 is formed in the fixed casing 30 of the drum 25 in a position above the horizontal plane 27 passing through the center 28 of the drum 25. The filling opening 29 corresponds roughly to a plurality of apertures of radially arranged compartments 26 (six in Fig. 2). The compartments 26 of the drum 25 which are released by the filling opening 29 may be filled with mops and, upon rotation of the drum 25 in clock-wise direction in Fig. 2, further compartments 26 may be filled with mops before the firstly filled compartment reaches a removal opening 31 releasing its aperture, which would result in that the filled-in mop drops out of its compartment 26. Otherwise casing 30 prevents that filled-in mops can drop out of its compartments 26.

For the purpose of saturating a mop 33 with cleaning solution and for removal of the (non-)saturated mop the device comprises a trough 35, which is accessible from outside. Trough 35 comprises a perforated flexible upper plate 36 and a perforated stiff lower plate 37. The stiff lower plate 37 is
arranged beneath the perforated flexible upper plate 36 at a small distance such, that an intermediate space 45 is formed inbetween. A cleaning solution may be filled into trough 35 until said intermediate space 45 is at least partly filled. A guide plate 32 is provided at the removal opening 32 for guiding a mop 33, which is dropping out from its respective compartment 26, into a removal position within trough 35 onto flexible upper plate 36. In this position mop 33 is horizontally fanned out, while its cleaning face 34 is in a downward orientation.

At removal of the mop 33, mop 33 is forcibly pressed against flexible upper plate 36, which results in that the flexible upper plate 36 is elastically deformed until it abuts against stiff lower plate 37. In case intermediate space 45 is at least partly filled with cleaning solution, by bringing upper plate 36 into contact with lower plate 37, mop 33 sinks into the cleaning solution and is saturated with solution at its removal.

For filling intermediate space 45 with cleaning solution a water container 39, a mechanical fluid pump 38, a container 46 filled with chemicals, and connecting lines for interconnecting containers 39, 46 and fluid pump 38 are provided. More particularly, fluid pump 38 is used to transport water from water container 39 and chemicals from chemicals container 46 through connecting lines 40, 41, 43 to opening 44 for filling of trough 35 with mixed cleaning solution. Connecting line 42 is used to admix chemicals from chemicals container 46 to water from water container 39 to produce the cleaning solution.

A lever arrangement is provided both for step-wise rotation of drum 25 and actuation of fluid pump 38. In said lever arrangement a manually operated first lever 48 is articulated with a second lever 45 which is articulated with a third lever 46. Third lever 46 is articulated with a hinged lever
47, which then is used to actuate fluid pump 38. Said lever arrangement is also used to actuate a means 49 for rotating drum 25 step-wise, such that each single actuation of manually operated first lever 48 results in a single rotational step of drum 25. Such step-wise rotation of drum 25 results in that a next compartment adjacent a compartment which currently is situated opposite to removal opening 31 is brought into a position opposite to removal opening 31, in which its aperture then will be released by removal opening 31. Fig. 2 shows two further mops 33, which are in a position to next reach removal opening 31 one after another.

Said lever arrangement comprises two different positions of manually actuated first lever 48. In a first position of first lever 48, which is reached by manually pulling first lever 48 downwards, drum 25 is rotated one step in a clockwise direction to bring a further compartment 26, which is adjacent in a counter-clockwise direction to that compartment, which is opposite to removal opening 31, in a position, in which it is in a position opposite to removal opening 31, to release its aperture by removal opening 31, so that filled-in mop 33 will drop out of its compartment 26. Afterwards, in a second position of first lever 48, which is reached by further pulling first lever 48 downwards, fluid pump 38 is actuated to fill trough 35 or intermediate space 45, respectively, with cleaning solution. Thus, in case first lever 48 is only pulled into its first position, drum 25 is rotated by one increment, corresponding to the peripheral distance of two adjacent compartments, and a single mop 33 drops out of its compartment, which may be removed as a dry mop 33. Otherwise, in case first lever 48 is first pulled into its first position and then pulled into its second position, drum 25 is rotated by one increment, corresponding to the peripheral distance of two adjacent compartments, a single mop 33 drops out of its compartment and trough 35 or intermediate space 45, respectively, is filled with cleaning
solution. In the latter case, mop 33 is saturated with cleaning solution at its removal.
CLAIMS

1. Procedure for cleaning floors by hand with the help of flat cleaning mops, wherein mops provided with a certain quantity of cleaning solution are used, characterized in that at least one mop is removed from a storage container (1), that the mops are saturated with solution before or during removal and that the solution is applied onto the surface of the mop.

2. Procedure according to claim 1, characterized in that the mops are fanned out and are stacked one on top of the other in the storage container (1).

3. Procedure according to claim 2, characterized in that only the respective mop removed from the stack (6) is saturated with solution.

4. Procedure according to claim 3, characterized in that the respective uppermost or lowermost mop of the stack (6) is saturated with solution and then removed.

5. Procedure according to claim 3, characterized in that the respective uppermost mop of the stack (6) is taken off and saturated with solution in the direction taken off behind the stack (6).

6. Procedure according to claim 1, characterized in that the mops are saturated with a metered quantity of the solution.

7. Procedure according to claim 6, characterized in that the mops are saturated with the solution via spraying.

8. Procedure according to claim 1, characterized in that the mops are kept as is after use in a holding con-
tainer (2) until disposed of for purposes of their regeneration.

9. Procedure for cleaning floors by hand with the help of flat cleaning mops, wherein mops provided with a certain quantity of cleaning solution are used, characterized in that at least one mop is removed from a storage container, that the mops are saturated with solution at removal and that the solution is applied onto the surface of the mop.

10. Procedure for cleaning floors by hand with the help of flat cleaning mops, wherein mops provided with a certain quantity of cleaning solution are used, characterized in that at least one mop is removed from a storage container, that the mops are saturated with solution after removal and that the solution is applied onto the surface of the mop.

11. Procedure according to claim 9 or 10, characterized in that the mops are individually filled in compartments (26) and are removed therefrom, respectively.

12. Procedure according to claim 11, characterized in that each compartment (26) is filled with a single mop.

13. Procedure according to claims 9 or 10, characterized in that the mops are removed from its respective compartments and are brought into a removal position, in which they are fanned out horizontally, which removal position is accessible from outside.

14. Procedure according to claim 13, characterized in that the mops (33) are brought into a removal position with a downward oriented cleaning face (34).
15. Procedure according to one of claims 9 and 10 to 14, characterized in that the mops (33) are saturated with solution at its removal by sinking it into a stock of cleaning solution.

16. Procedure according to claim 15, characterized in that each mop (33) is saturated with a metered quantity of the solution.

17. Procedure according to claim 9 or 10, characterized in that the mops are kept as is after use in a holding container until disposed of for purposes of their regeneration.

18. Procedure according to claim 8 or 17, characterized in that the storage and holding containers (1, 2) are safeguarded against unauthorized removals.

19. Procedure according to claim 1, 9 or 10 characterized in that removal of the mops from the storage container (1) is automatically controlled.

20. Device for fitting and preparing flat cleaning mops with a storage container, which stores a larger number of mops, has a removal opening (5) for removing mops, and is provided inside with a feeding device (11) for saturating the mops with cleaning solution.

21. Device according to claim 20, characterized in that it also has a holding container (2) for accommodating the dirty mops after their use.

22. Device according to claim 20, characterized in that it comprises a metering device that routes an adjustable quantity of the solution to the feeding device (11) from a tank (13) with fresh cleaning solution.
23. Device according to claim 22, characterized in that the metering device, the tank (13) for the cleaning solution and a compressed air bottle (14) are situated in a separate casing (3) to convey the solution via compressed air to the feeding device (11).

24. Device according to claim 20, characterized in that the feeding device (11) is designed as a spraying device.

25. Device according to claim 20, characterized in that the storage container (1) has a magazine with a horizontal cross section, which corresponds roughly to the dimensions of a fanned-out mop, and whose height is dimensioned according to the stacking height of the number of fresh mops stacked one on top of the other therein.

26. Device according to claim 25, characterized in that the stack (6) with fresh mops is situated below, and the feeding device (11) above, inside the storage container (1) relative to the removal opening (5).

27. Device according to claim 26, characterized in that the feeding device (11) has spray nozzles distributed over the container cross section, which are connected with the metering device.

28. Device according to claim 25, characterized in that an intermediate floor (7) carrying the stack (6) and situated in the storage container (1) can be adjusted in height based on the stack height, which diminishes as the mops stacked in the magazine are removed.

29. Device according to claim 28, characterized in that the height of the intermediate floor (7) can be incrementally adjusted, wherein the height is adjusted by about the thickness of one mop in each increment.
30. Device according to claim 29, characterized in that each height adjustment is linked with an actuation of the metering device, so that the respectively removed mop or uppermost mop of the stack (6) is saturated with solution (6).

31. Device according to claim 28, characterized in that the height of the intermediate floor (7) is advantageously adjusted by a spring force, exerted by the removal of the stack weight or through the use of an upper stop.

32. Device according to claim 20, characterized in that the removal opening (5) is sealed from outside by a flap (12), which, when opened, actuates the metering device, whose subsequent actuation is disabled until the saturated mop has been removed.

33. Device according to claim 21, characterized in that the lid section (20) of the holding container (2) has a feed inlet (21) bridged to the inside by a deflection compartment (23), which prevents a hand from reaching in.

34. Device according to claim 25, characterized in that the storage container (1) has a drip floor (10) below the stack (6) for cleaning solution released to the sides of the stack (6).

35. Device for fitting and preparing flat cleaning mops with a storage container, which stores a larger number of mops and has a removal opening for removing mops, which device is provided with a feeding device for prior saturating the removed mops with cleaning solution.

36. Device according to claim 35, characterized in that the feeding device is formed as a flat trough (35).
37. Device according to claim 36, characterized in that the trough (35) comprises a perforated flexible upper plate (36) and a stiff lower plate (37), the stiff lower plate (37) being arranged underneath the perforated flexible upper plate (36) at a distance such, that, upon elastic deformation of the flexible upper plate (36), the flexible upper plate (36) may abut against the stiff lower plate (37).

38. Device according to claim 37, characterized in that the stiff lower plate (37) is perforated.

39. Device according to claim 35, characterized in that the storage container is formed as a rotatable drum (25) having a plurality of radially arranged compartments (26), wherein the dimensions of each compartment correspond roughly to the dimensions of a fanned out mop.

40. Device according to claim 39, characterized in that the removal opening (31) for removing mops from the drum (25) is formed in a fixed casing (30) of the drum (25), wherein the removal opening (31) is arranged in a position underneath a horizontal plane (27) passing through the center (28) of the drum, and wherein the aperture of the removal opening (31) corresponds roughly to an aperture of the radially arranged compartments (26).

41. Device according to claim 40, characterized in that a guide plate (32) is arranged at the removal opening (31) for guiding the mops to a removal position in the trough (35).

42. Device according to claim 39, characterized in that a filling opening (29) for filling mops in the storage container is formed in a fixed casing (30) of the drum (25), wherein the filling opening (29) is arranged in a
position above a horizontal plane (27) passing through the center (28) of the drum (25).

43. Device according to claim 42, characterized in that an aperture of the filling opening (29) corresponds roughly to a plurality of apertures of the radially arranged compartments (26).

44. Device according to claim 35, characterized in that it has a holding container for accommodating the dirty mops after their use.

45. Device according to claim 35, characterized in that it comprises a metering device that routes an adjustable quantity of the solution to the feeding device from a tank with fresh cleaning solution.

46. Device according to claim 44, characterized in that a lid section (20) of the holding container (2) has a feed inlet (21) bridged to the inside by a deflection compartment (23), which prevents a hand from reaching in.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B08B 7/00, 3/00
US CL. : 134/6, 18, 95.3, 172, 177, 198, 200, 201

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEACHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 134/6, 18, 95.3, 172, 177, 198, 200, 201

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 4,174,977 A (SHALLENBERG et al) 20 November 1979 (20.11.79), see the document in general.</td>
<td>1, 6, 9, 10</td>
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<td>2-5, 7-8, 11-46</td>
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<tr>
<td>A</td>
<td>US 5,058,738 A (SVENSSON) 22 October 1991 (22.10.91), see the document in general.</td>
<td>1, 6, 9, 10</td>
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<td>2-5, 7-8, 11-46</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search

06 November 2003 (06.11.2003)

Date of mailing of the international search report

23 DEC 2003

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