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Cleaning Device and Method

The present invention relates to a device for machine cleaning the tread elements of an escalator or a rolling walkway according to the preamble of claim 1, to a corresponding automatic cleaning method and to a method for cleaning the tread elements of an escalator or a rolling walkway with a controllable drive, and to a device for carrying out said method.

DE 195 39 186 A1 discloses a cleaning device for cleaning the tread elements of an escalator according to the preamble of claim 1. In this development a brush which consists of a rotating drivable belt with rows of brushes attached thereto serves to clean the tread surfaces and the front surfaces of the steps. The belt comprises a horizontal section acting on the tread surface of the step, and a vertical section acting on the front surface of the step. Furthermore, the device is provided with spray nozzles for applying a washing fluid from a supply tank and with a collecting container for dirty water which is supplied to the collecting container via a suction device arranged at the end of the path of actuation. After the cleaning operation for a first lower step has been completed, the device is gradually lifted step by step with the aid of a lifting means and by an operator to be then deposited at the respective place for a new cleaning cycle. Hence, the device on the whole must be moved upwards, which may turn out to be cumbersome and, in the final analysis, also dangerous for the operator.

The design of the cleaning element as a rotating brush belt often yields unsatisfactory results, specifically when the element is used on escalators, as the corner portions between the tread surfaces and the front surfaces are frequently cleaned in an unadequate manner. On account of their mounting the brushes do not



move or only move partly into the corner portions, so that no adequate cleaning effect is achieved, in particular at such problematic places. A later cleaning operation by hand is then often required at said places. To move the cleaning device onwards by one tread element, it must be guided manually so that the permanent presence of an operator is required, which renders an economic use difficult.

Starting from the above, it is the object of the present invention to provide an improved device and an improved method for cleaning tread elements of an escalator or a rolling walkway for ensuring a thorough and substantially automatic cleaning action.

With a cleaning device of the above-mentioned type, said object is achieved with the features of the characterizing part of claim 1 and by a method comprising the features of claim 20.

Advantageous developments are the subject matter of the dependent claims.

Since the means with the cleaning members can be driven in an oscillating manner approximately in parallel with the tread surfaces, i.e. is automatically moved in the horizontal direction in a reciprocating movement over the tread surface, a thorough cleaning of all areas of the tread element is ensured. This is specifically advantageous in the case of groove-profiled escalators and rolling walkways in which dirt and deposits can easily accumulate in the grooves and can only be removed under difficulties. The cleaning operation with the oscillatory movements specifically makes it possible whenever escalators are cleaned that the cleaning members move up into the corner portion formed between a step and the front surface of the next-higher step, so that this corner portion is also cleaned in a satisfactory manner.



According to an advantageous development of said cleaning device the means which carries the cleaning members is designed to be oscillatingly drivable also in the vertical direction in synchronism with the horizontal oscillatory movement. With such an embodiment of the cleaning device an oscillatory horizontal movement can be synchronously superimposed with the oscillatory vertical movement, so that during each cycle the cleaning members are first lowered onto the tread surfaces, then upon contact with the tread surfaces are retracted, thereupon they are lifted again and above the tread surfaces they are again returned to the lowering point. Dirt and deposits are thereby moved in one direction out of the grooved profile of the tread elements of the escalator or the rolling walkway so that the dirt is not whirled up, but pushed in one direction. Since the cleaning members, due to the oscillatory movements, repeatedly sweep over the surfaces to be cleaned, a thorough cleaning of all areas of the tread element is guaranteed.

The horizontal oscillatory movement of the cleaning members can be carried out such that only part of the surface to be cleaned is covered. The means which carries the cleaning members is then adjustably supported over the tread surface so that it is gradually pulled over the tread surface while the oscillatory movement is performed. An enhanced cleaning effect is achieved by the path of the oscillatory movement being shortened in this way.

The cleaning members can be used for cleaning both the tread surfaces and the front surfaces of the steps of an escalator. However, it is particularly advantageous when special second cleaning members, e.g. in the form of an absorbent pad, are provided that act on the front surfaces of the steps, with the means being also adjustable in the vertical direction. To be more specific, when an escalator is cleaned, the dirt of the front surfaces can be wiped off and absorbed. As will be



explained further below, the pad can automatically be wiped off and cleaned in a collecting tub.

To clean the corner portion in an even further improved manner when escalators are cleaned, cleaning brushes which extend in a direction transverse to the motional direction of the escalator are advantageous as cleaning members for the tread surfaces.

When the individual cleaning elements are not configured in accordance with the width of a tread element, the cleaning device is laterally shifted or automatically displaced within the cleaning device after a portion of a tread element has been cleaned. It is however particularly advantageous when the cleaning members extend approximately over the width of the escalator.

To ensure longer service lives of the cleaning members without the need for any replacement, spray nozzles and/or a collecting tub which is preferably equipped with a wiper may be provided for cleaning the cleaning members between individual operations. To this end a mechanism may e.g. be provided for wiping off the cleaning members on the wiper and for cleaning the same with the help of the spray nozzles.

Specifically with escalators and rolling walkways with a controllable drive, the object underlying the invention is also achieved by a method comprising the features of the characterizing part of claim 25 and by a generic device comprising the features of claim 34.

Advantageous developments are also the subject matter of the subclaims depending on said claims.



Since the drive of the escalator or the rolling walkway can be controlled by signals emitted by the control unit of the cleaning device, the cleaning device itself can fetch the escalator, for instance, intermittently and step by step, so that the cleaning operation can be performed automatically without any operator by electronic communication between cleaning device and escalator control unit. To this end a connection for connection to the control unit of the escalator or the rolling walkway is provided in the inventive device on the control unit of the cleaning device.

Such a method and such a device enable the cleaning device to control the escalator after a predetermined number of tread elements have been cleaned so as to move said escalator onwards by a predetermined number of tread elements. While the respective number of tread elements are being cleaned, the cleaning device is in the same position whereas the escalator or the rolling walkway continues its travel. This travel is triggered by the signals of the control unit of the cleaning device. Hence, it is in particular not necessary to move the device upwards along the steps. A fully automatic cleaning sequence is possible thanks to the direct automatic communication between the escalator or rolling walkway and the cleaning device.

In an advantageous development the cleaning device is moved into the one end of the escalator or the rolling walkway and the drive control unit of the escalator or the rolling walkway is connected to the control unit of the cleaning device. A first number of tread surfaces, e.g. one, will then be cleaned with the cleaning device. After the cleaning operation has been completed, the control unit of the device transmits a signal to the drive control unit of the escalator or the rolling walkway so that the escalator can be moved further by a number of tread elements corresponding to the first number, and the operation can be started anew.



The cleaning device has just to be positioned by an operator once, e.g. at the lower end of the escalator; all of the other operations will then be performed automatically until the entire escalator has been cleaned.

The connection of the control unit of the cleaning device to the drive of the escalator or the rolling walkway can be established with the help of a correspondingly adapted interface cable.

The cleaning operation is here performed in a particularly advantageous manner in accordance with the method according to claims 18 to 20 or with a cleaning device according to any one of claims 1 to 19. When the device is used on an escalator, it is particularly advantageous when the front surfaces of the steps are cleaned in addition to the cleaning of the tread surfaces. To this end the control unit of the cleaning device controls the stairs in such a manner that at least one front surface is exposed and that a front-surface cleaning operation is then also possible after or before the tread-surface cleaning operation.

A cleaning method according to any one of claims 23 and 24 is preferably used for cleaning the respective front surfaces.

The drawings show a preferred embodiment of an inventive device which will be explained in the following together with the method of the invention.

Fig. 1 is a side view showing a cleaning device of the invention in its operative position which has been assumed for cleaning the tread surface of a step of an escalator;

Fig. 2 shows the cleaning device according to Fig. 1 while the front surface of a



step is being cleaned;

Fig. 3 shows the cleaning device according to Fig. 1 in an intermediate position;

Fig. 4 is an enlarged view showing the support arm provided in the cleaning device of Fig. 1 with a plunger;

Fig. 5 is a section taken along line V-V of Fig. 4; and

Fig. 6 is an enlarged sectional view of the cleaning members provided in the cleaning device of Fig. 1 and including an associated spray nozzle and a collecting tub.

The device which is shown in Figs. 1 to 3 and designated by 11 in each figure serves to clean the steps 2 of an escalator 1 and consists essentially of a support arm 13 which is arranged in a movable housing 12 and is adjustable in vertical and horizontal direction and has mounted thereon an oscillatingly drivable plunger 14 equipped with cleaning members 61, 62. Thus the cleaning members 61, 62 can act on the tread surfaces 3 and the front surfaces 4 of the individual steps 2 repeatedly, thereby freeing the same from dirt. The cleaning members 61 for the tread surfaces 3 are rows of brushes which are arranged in a direction perpendicular to the plane of the figures and which can also work their way into the grooved profile of the tread surfaces in an efficient manner. The cleaning members 62 for the front surfaces 4 are designed as sponges.

To enable the cleaning device 11 to automatically assume its operative position, two wheels 21 and one or two vertically adjustable drive wheels 22 are provided in an end portion of the housing 12, which is equipped with a grip member 20, and



vertically adjustable running wheels 26 and one or two change-over wheels 29 are provided in the opposite end portion. An electric motor, which is not shown for the sake of clarity, is provided for driving the drive wheels 22. Toothed racks 23 and 27, respectively, which are adjustable by a motor 24 via a gearing 25 assigned thereto or directly by a motor 28 serve to vertically adjust the drive wheels 22 and the running wheels 26. Furthermore, the support arm 13 is also adjustable horizontally in the direction of arrow C with the aid of a spindle 16 and an associated drive motor 17 and vertically in the direction B with the aid of a further spindle 18 having an associated drive motor 19.

To be able to oscillatingly drive the plunger 14 and the cleaning members, which consist of brushes 61 and, for instance, of a sponge 62, the plunger 14, as can particularly be seen from Figs. 4 and 5, is drivingly connected via a crank mechanism 31 to the drive motor 32. The drive shaft 33 of the drive motor 32 has mounted thereon a crank 34 which is provided with a crank pin 35 and an inertial mass 34'. The crank pin 35 engages into a recess which is incorporated into a plate 36 and designed in the form of an elongated hole 37. The plate 36 forms part of the plunger 14 so that said plunger is horizontally drivable via the crank mechanism 31.

To adjust the plunger 14 in the vertical direction at the same time, a cam 38 which is drivable by means of a belt drive 43 acts on said plunger, and the plunger 14 is supported to be pivotable about two bolts 39 by means of a linkage 41 which is provided with guide rolls 32. To this end the bolts 39 are rotatably supported in two plates 40 which enclose the crank mechanism 31 and are held together by means of screws 57.

The belt drive 43 which is provided for driving the cam 38 and which has assigned thereto a tension roller 46 is guided by deflection rollers 44 and 45 which are



drivingly connected to the drive shaft 33 of the drive motor 42 and to the cam 38. To effect a constant contact of the plunger 14 on the cam 38, a compression spring 49 is provided which is arranged on a bolt 48 and which at one end carries a roll 50 resting on the plunger 14. Apart from the free end of the bolt 48, the compression spring 49 is also supported on an attachment piece 47 which is secured to the plunger 14. When the plunger 14 is pivoted downwards around the bolts 39 by rotation of the cam 38, the compression spring 49 is tensioned, so that the plunger 14 is returned in accordance with the configuration of the cam 38. A control means (not explicitly shown in the figures) which e.g. comprises a microprocessor is provided for controlling the individual components of the cleaning device 11. The microprocessor controls the drive of the oscillating plunger, the vertical and horizontal movements of the support arm 13 with the aid of motors 19 and 17 and the vertical adjustment as well as the drive of the running wheels 26 and 22. Furthermore, it is possible with the microprocessor to control the drive of the escalator to move the same onwards by a defined number of steps. To this end an interface cable is provided which can be linked to a control input of the escalator 1.

To clean the tread surfaces 3 and the front surfaces 4 of the individual steps 2 of the escalator 1 with the device 11, said device 11 has just to be positioned in the end portion of the escalator 1, and the control units of the device 11 and of the escalator 1 have just to be linked to each other. This is accomplished by way of the interface cable. In the stopped state of the escalator 1 the control unit of the motor controls the drive wheels 22 of the device 11 in such a manner that said device will be moved automatically until a sensor 55 which is mounted on the axle 29 of the running wheels 26 and which is also connected to the control unit outputs a signal because of the fact that a step 2 is approached. Thereupon, the control unit moves the escalator 1 whereby the latter travels upwards. The cleaning device 11 is thereby



pulled into the position shown in Fig. 1, said movement being possibly supported by the drive of the running wheels 22.

In another development, the running wheels 26 are vertically extended upon the output of the signal from the sensor 55 and the device 11 is displaced with the aid of the drive wheels 22 by a predetermined path in the direction of the escalator 1. The running wheels 26 are then retracted again in such a manner that the change-over wheel 29 is supported on the successive step. The next step of the escalator 1 is traveled over in the same manner so that the device 11 also assumes the position shown in Fig. 1.

In the stopped state of the escalator a horizontal displacement of the support arm 13 will free the tread surface 3 from dirt and a vertical displacement of the support arm the front surface 4, namely by means of the cleaning members 61 and 62, respectively.

In particular in the case of a horizontal displacement for cleaning the tread surfaces 3, the plunger 14 will perform oscillatory movements so that each of the cleaning members 61 acts on the same places of the tread surfaces repeatedly. This is accomplished by driving the crank mechanism 31 by motor 32. The oscillatory horizontal movement is superimposed by a synchronous oscillatory vertical movement, so that during one cycle the cleaning members 61 are first lowered onto the tread surfaces 3, then in contact with the tread surfaces 3 are retracted by a predetermined distance, thereupon they are lifted again and, above the tread surfaces 3, they are again returned to the lowering point. The horizontal portion of said oscillatory movement covers only part of the tread surface 3 in the motional direction of the escalator 1. In Fig. 1, A schematically designates the motional



sequence of said oscillatory movement of the cleaning brushes 61. For the sake of clarity, curve A is, however, drawn one step lower.

Thanks to an additional and continuous horizontal adjustment of the support arm 13 with the aid of the drive motor 17 on the spindle 16, the plunger 14 is moved rearwards in the motional direction of the escalator, in addition to the oscillatory movement, so that dirt and deposits are successively removed from the grooved profile of the tread surface. An efficient cleaning of the grooved profile of the tread surface 3 is ensured by the oscillatory movement.

For cleaning the front surface 4 of a step the support arm 13 is moved upon a signal from the control unit with the aid of the drive motor 17 along the spindle 16 towards the front surface 4 of a step 2.

The cleaning members which are designed as a sponge 62 and used for cleaning the front surfaces 4 are mounted on an intermediate member 51 which is pivotably held by means of a hinge 52 on the plunger 14. The intermediate member 51 is pressed against the stop plate 53 by a pneumatic spring 54. When the plunger 14 is now moved upwards with the aid of the drive motor 19 on the spindle 18 after the sponge 62 has come into contact with the front surface 4, said intermediate member 51 will be able to follow the profile of the front surfaces 4 whereby an optimum contact of the sponge 62 with the front surface 4 is ensured. Depending on the degree of soiling the front surface 4 can thereby be cleaned with the sponge 62 once or repeatedly.

When the operations for cleaning the tread surface 3 and the front surface 4 have been completed, the cleaning device is moved rearwards by the control unit with the aid of the drive wheels 22. With the aid of the change-over rollers 29 the running



wheels 26 are put onto the next-lower step 2, and the running wheels 26 can be displaced downwards by a certain length with the help of the motor 28 and the toothed rack 27. This results in a state as is shown in Fig. 3. The control unit now sends a signal to the drive of the escalator again so that the latter moves upwards by one step. Like in the initial process, the cleaning device 11 is again pulled into the position shown in Fig. 1. The control unit transmits a stop signal to the drive of the escalator 1 and the cleaning operation for the next tread surface or the next front surface can be started now.

The movement of the cleaning device 11 is monitored by a number of sensors. Sensors 55 and 56 are shown by way of example in the drawings. The sensor 55, for instance, serves to output a signal when the cleaning device abuts on a front surface 4; the sensor 56 serves to detect the distance from a tread surface 3. Further sensors, for instance for the lateral alignment of the device 11, may be provided and used for changing the position of the device 11 automatically.

The support arm 13 with the plunger 14 and the cleaning members 15 can be moved into a position in which a cleaning operation can be carried out with the spray nozzle 63 (see Fig. 6). Such a cleaning operation may be performed periodically, e.g. after the cleaning of a number of steps, which number has been predetermined by a user. The sponge 62 is cleaned by being sprayed with the help of the spray nozzle 63 and can then be pressed out on the wiper member 65. The exiting cleaning liquid is collected in the collecting tub 64 and possibly pumped off or let out. The wiper 65 can also be used for wiping off the cleaning brushes 61 that serve to clean the tread surfaces 3. To this end the control unit 11 predetermines a corresponding motional sequence for the support arm 13. To this end the support arm 13 is retracted at such a level that the cleaning brushes are wiped off on the wiper 65. After the cleaning



members 61, 62 have been cleaned, the cleaning operation for the escalator 1 is continued in the manner as described.

The method has been described for a case where the escalator is moved upwards by the control unit by one step 2 each. With a corresponding control of the components of the cleaning device 11, specifically of the running wheels 22 and 26, the method can also be carried out when the escalator is moved downwards by one step each after a tread surface and a front surface have been cleaned. Likewise, the device can be used for cleaning a rolling walkway, the front surfaces being then of course not cleaned.

With the cleaning device of the invention escalators and rolling walkways, respectively, can be cleaned in a particularly thorough, fully automatic and thus economic manner. The device need only be positioned in the end portion of the escalator or the rolling walkway and will automatically carry out the rest of the cleaning operation. To be more specific, when escalators are cleaned, the corner portion between the respective front surface 4 and the underlying tread surface 3 is reliably cleaned through an oscillatory movement of the cleaning members, in the illustrated example the cleaning brushes 61.





Patent Claims

1. A device for machine cleaning the tread elements of an escalator or of a rolling walkway, said device comprising a housing which is movable and vertically adjustable in a controlled manner and includes a means which comprises first cleaning members that act at least on the tread surfaces of the individual tread elements of the escalator,
characterized in that
the means (14) with the cleaning members is oscillatingly drivable approximately in parallel with the tread surfaces (3).
2. The cleaning device according to claim 1,
characterized in that
during the horizontal oscillatory movement the means (14) is also oscillatingly drivable in the vertical direction.
3. The cleaning device according to any one of claims 1 and 2,
characterized in that
the means (14) is horizontally adjustable during the oscillatory movement.
4. The cleaning device according to claim 3,
characterized in that
the means (14) comprises a drivable plunger (14) which is supported by a support arm (13) arranged in the housing (12) and whose free end has mounted thereon the cleaning members (61), the horizontal displacement being performable with the aid of the support arm (13), and the plunger (14) being oscillatingly drivable relative to the support arm (13).





5. The cleaning device according to claim 4,
characterized in that
for oscillatingly driving the plunger (14) said plunger is drivingly connected via a crank mechanism (31) to a drive motor (32) and pivotably supported about an axis (39) in the vertical direction by means of a drivable cam (38) against the action of a spring (49).
6. The cleaning device according to claim 5,
characterized in that
the plunger (14) is provided with a recess (37), e.g. in the form of an elongated hole (37), which is incorporated into a plate (36) molded thereon, and in which the crank pin (35) of the crank mechanism (31) which acts on the plunger (14) is displaceably guided.
7. The cleaning device according to any one of claims 5 and 6,
characterized in that
the plunger (14) is displaceably guided in a linkage (41) which is pivotably supported and provided with guide rolls (42), slide rails, or the like.
8. The cleaning device according to one or several of claims 5 to 7,
characterized in that
the cam (38) is drivingly connected to the drive motor (32) assigned to the plunger (14), e.g. via a chain drive or a toothed belt drive (43).
9. The cleaning device according to any one of claims 4 to 8,
characterized in that





a first drivable spindle (16), a chain drive or a belt drive, a servo means which is operable by pressurizing means, or the like, is provided for horizontally adjusting the support arm (13).

10. The cleaning device according to any one of claims 1 to 9,
characterized in that
the device (11) comprises second cleaning members (62) acting on the front surfaces (4) of the steps (2), and that the means (14) is also adjustable in the vertical direction.

11. The cleaning device according to claim 10 and one of claims 4 to 9,
characterized in that
a second drivable spindle (18), a chain drive or a belt drive, a servo means which is operable by pressurizing means, or the like, is provided for vertically adjusting the support arm (13).

12. The cleaning device according to any one of claims 1 to 11,
characterized in that
in the area facing away from the tread elements (2) the housing (12) of the device (11) is provided with wheels (21) and with at least one vertically adjustable drive wheel (22) and, in the opposite area, with one or two vertically adjustable running wheels (26) and at least one change-over roller (29).

13. The cleaning device according to claim 12,
characterized in that
a toothed rack (23 and 27, respectively) which is drivable in a controlled manner or a servo means which is operable by pressurizing means is provided for vertically adjusting the drive wheels (22) and/or the running wheels (26).





14. The cleaning device according to one or several of claims 1 to 13, at least according to claim 10,
characterized in that
a proximity switch (50), or the like, is mounted in the area of the device (11) facing the steps (2), for instance on an axle carrying the running wheels (26).
15. The cleaning device according to one or several of claims 1 to 14,
characterized in that
the cleaning members (61, 62) are mounted on an intermediate member (51) which is detachably connected to the plunger (14) to be pivotable to a limited degree against the action of a spring (54).
16. The cleaning device according to one or several of claims 1 to 15,
characterized in that
one or a plurality of brushes (61) are provided as cleaning members for cleaning the tread surfaces (3) of the tread elements (2), the brushes extending in a direction transverse to the motional direction of the escalator (1) or the rolling walkway and preferably approximately over the width of the tread elements (2).
17. The cleaning device according to any one of claims 1 to 16, at least according to claim 10,
characterized in that
one or a plurality of cleaning cloths, sponges (62), or the like, are provided as the second cleaning members for cleaning the front surfaces (4) of the steps (2), said members extending approximately over the width of the escalator (1).
18. The cleaning device according to any one of claims 1 to 17,





characterized by

a collecting tub (64) which is preferably provided with a wiper (65).

19. The cleaning device according to any one of claims 1 to 18,

characterized by

one or a plurality of spray nozzles assigned to the cleaning members (61, 62).

20. A cleaning method for automatically cleaning the tread elements (2) of an escalator (1) or a rolling walkway, wherein the tread surfaces (3) of the tread elements (2) are cleaned by performing an oscillatory movement of cleaning members (61) approximately in parallel with the tread surfaces (3).

21. The cleaning method according to claim 20,

characterized in that

the oscillatory movement along the tread surfaces (3) is superimposed by an oscillatory vertical movement in such a manner that during each cycle the cleaning members (61) are first lowered onto the tread surfaces (3), then in contact with the tread surfaces (3) are retracted, thereupon are lifted again and, above the tread surfaces (3), are again returned to the lowering point.

22. The cleaning method according to any one of claims 20 and 21,

characterized in that

the oscillatory movement along the tread surfaces (3) respectively covers only part of the tread surface (3) to be cleaned and the cleaning members (61) are gradually pulled over the entire tread surface (3) and displaced accordingly while the oscillatory movement is carried out.

23. The cleaning method according to any one of claims 20 to 22,





characterized in that

at least one cleaning element (62) is moved along the front surfaces for cleaning the front surfaces (4) of the steps (2) of an escalator (1).

24. The cleaning method according to claim 23,

characterized in that

the at least one cleaning element (62) is guided from the bottom to the top along the front surfaces (4).

25. A method for cleaning the tread elements of an escalator or a rolling walkway with a controllable drive with the aid of a cleaning device, wherein the drive of the escalator (1) or the rolling walkway is controlled by signals emitted by the control unit of the cleaning device (11).

26. The method according to claim 25,

characterized in that

the cleaning device (11) is moved into the one end of the escalator (1) or the rolling walkway, and the drive control unit of the escalator (1) or the rolling walkway is connected to the control unit of the cleaning device (11), a first number of tread surfaces (3) of tread elements (2) are cleaned by the cleaning device (11) and, after the cleaning process, the drive of the escalator (1) or of the rolling walkway is controlled by signals emitted by the control unit of the cleaning device (11) in such a manner that the escalator (1) or the rolling walkway is moved further by a number of tread elements (2) corresponding to said first number.

27. The method according to claim 26,

characterized in that





after the cleaning device (11) has been moved into the one end of the escalator (1) or the rolling walkway the control unit of the cleaning device (11) controls said device in such a manner that it automatically assumes the position for cleaning a tread surface (3) of a tread element (2).

28. The method according to any one of claims 25 to 27,
characterized in that
a cleaning method according to one or several of claims 20 to 22 is used for cleaning the respective tread surfaces (3).

29. The method according to claim 28,
characterized in that
a cleaning device (11) according to one or several of claims 1 to 19 is used for carrying out the method.

30. The method according to any one of claims 26 to 29,
characterized in that
the method is used for cleaning an escalator (1) and the control unit of the cleaning device (11) controls the cleaning device (11) in such a manner that said device in the position for cleaning the first number of tread surfaces (3) additionally cleans a corresponding number of front surfaces (4) of steps (2) of the escalator (1) before the escalator (1) is moved by a number of steps corresponding to the first number.

31. The method according to claim 30,
characterized in that
a cleaning method according to any one of claims 23 and 24 is used for cleaning the respective front surface (4).





32. The method according to any one of claims 30 and 31,
characterized in that

the cleaning device (11) is moved into the lower end of the escalator (1) before the individual steps (2) are cleaned and, after the first number of tread surfaces (3) and the corresponding first number of front surfaces (4) have been cleaned, the escalator (1) is moved upwards by a number of steps corresponding to said first number.

33. The method according to any one of claims 25 to 32,
characterized in that
the first number is one.

34. A device for cleaning the tread elements of an escalator or a rolling walkway with a controllable drive, said device comprising cleaning members acting on the individual tread elements of the escalator or the rolling walkway, and further comprising a control unit with a connection to the drive of the escalator (1) or the rolling walkway, so that the movement of the escalator (1) or of the rolling walkway can be controlled by signals emitted by the control unit of the device (11) in such a manner that the escalator or the rolling walkway can be moved by a predetermined number of tread elements (2).

35. The device according to claim 34,
characterized by

a housing (12) which is movable and vertically adjustable in a controlled manner and is used for accommodating a means (14) which comprises the cleaning members (15, 61) acting on the tread surfaces (3), and a horizontal drive for moving the housing (12), said horizontal drive being controlled by the control unit of the device (11).





36. The device according to claim 35,
characterized in that
the device (11) serves to clean an escalator (1) and comprises a vertical drive for
vertically adjusting the housing (12), said vertical drive being controlled by the
control unit of the device (11).

37. The device according to any one of claims 34 and 36,
characterized in that
a device according to any one of claims 1 to 19 is used for cleaning the tread
elements (2).

38. The cleaning method according to any one of claims 20 to 24,
characterized in that
a device according to any one of claims 1 to 19 is used.

