

LIQUID SPRAYING APPARATUS

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the priority of Korean Patent Application No. 10-2017-0143003 filed on 31 October 2017, the entire contents of which are incorporated herein by reference.

BACKGROUND

(a) Technical Field

The present invention relates to a liquid spraying apparatus, and more particularly, to a liquid spraying apparatus for implementing functions of preventing scattering and reapplying.

(b) Background Art

In the case of painting a paint on the outer wall of a building or implementing various images such as a picture, a character, a symbol, and a logo for an image and the like of a building, in the related art, a worktable is suspended by the rope to be moveable vertically on the rooftop of the building using a gondola or the like, and an operator has directly performed a painting operation or an imaging operation while getting on the worktable or performed the painting operation or the imaging operation while climbing down a rope fixed on the rooftop.

Particularly, when the operator draws the image on the outer wall of the building, a designer makes a rough sketch on the wall of the building by the same means and method as described above and then, a painter draws the made design phrase using a brush or a paint roller.

However, this method has a disadvantage in that the operator needs to directly perform such a painting operation or imaging operation at a high place of the outer wall of the building, and thus is always exposed to the risk of fall accident, and the risk of accidents is further increased on a somewhat strong windy day.

Further, since the operator performs the painting operation or the imaging operation at the high place, the operator is not free to move and as a result, there is a problem in that the painting operation or the imaging operation is slowed down and thus an operating period is increased.

In addition, in addition to the risk of industrial accidents, due to the characteristic of the painting operation manually performed by the operator, labor costs have been unnecessarily increased and thus an increase in construction costs has been caused.

In the case of painting the paint on the outer wall of the building or implementing various images such as a picture, a character, a symbol, and a logo for an image and the like of a building, in the related art, the operation is manually performed, but it is difficult to expect a realistic value even though the operation is natural. Particularly, when figures, patterns, and photographs are expressed by large printed matters, it is not easy to express one large image and thus, the size of the printed matter has no choice but to be extremely limited.

For the above reason, an apparatus for painting a paint on the outer wall of the building or printing automatically various images such as figures, characters, symbols, and logos for the image and the like of the building has been developed, but a conventional

printing apparatus cannot solve a problem that the paint is scattered during operation.

In addition, the conventional printing apparatus has a problem that painting performance and printing performance are not completely satisfied by consumers.

Of course, the above problem occurs even when various images are automatically printed on the inner wall of the building using the conventional printing apparatus.

SUMMARY OF THE DISCLOSURE

The present invention has been made in an effort to provide a liquid spraying apparatus capable of preventing scattering of a liquid which may occur in a process of applying an outer wall or an inner wall of a building or printing various images by spraying a liquid including paints, ink, and the like and improving applying and printing performance.

An exemplary embodiment of the present invention provides a liquid spraying apparatus as an apparatus which sprays a liquid on a target surface to apply an outer wall or an inner wall of a building or print various images, the liquid spraying apparatus including: a frame; a spraying unit which is movably mounted on the frame and sprays the liquid on the target surface; and a scattering prevention unit which is disposed in front of the spraying unit to prevent scattering of the liquid sprayed by the spraying unit, in which the scattering prevention unit absorbs the liquid sprayed by the spraying unit to prevent scattering of the liquid.

At least a part of the scattering prevention unit may be located in a spraying range of the liquid sprayed by the spraying unit.

The scattering prevention unit may be formed by a cylindrical sponge.

At least a part of the scattering prevention unit may be located beyond a spraying range of the liquid sprayed by the spraying unit.

The scattering prevention unit may include a first scattering prevention unit and a second scattering prevention unit which are disposed at upper and lower sides of the spraying unit, respectively, and the first scattering prevention unit and the second scattering prevention unit may be spaced apart from each other to form a spraying space for directly spraying the liquid sprayed by the spraying unit on the target surface.

A side of the spraying space may be closed so as to prevent the liquid sprayed by the spraying unit from being scattered.

The first scattering prevention unit and the second scattering prevention unit may be formed by cylindrical sponges and rotatable.

The first scattering prevention unit and the second scattering prevention unit may be rotated by contact with the target surface.

Sides of the first scattering prevention unit and the second scattering prevention unit may be closed so as to prevent the liquid sprayed by the spraying unit from being scattered.

The scattering prevention unit may be moved in a vertical direction by interlocking with the vertical movement of the spraying unit.

The scattering prevention unit may be position-shifted based on the frame to change a positional relationship with the spraying unit.

The frame may include a horizontal support frame supporting a horizontal movement of the spraying unit, a vertical support frame supporting a vertical movement of the horizontal support frame so that the vertical movement of the spraying unit is implemented, and a mounting frame on which the scattering prevention unit is mounted, and the mounting frame may be moved in a vertical direction by interlocking with the vertical movement of the horizontal support frame.

The mounting frame may surround the horizontal support frame and define a limitation on the horizontal movement of the spraying unit.

The scattering prevention unit may have a width corresponding to a width in the horizontal direction of the mounting frame.

The scattering prevention unit may be located so as to further protrude forward than the mounting frame.

The spraying unit may include a first spraying unit and a second spraying unit which are disposed in a vertical direction, and the first spraying unit and the second spraying unit may be mounted on the frame to be independently movable.

According to the liquid spraying apparatus of the present invention, it is possible to prevent scattering of a liquid which may occur in a process of applying a liquid on an outer wall or

an inner wall of a building or printing various images by spraying the liquid including paints, ink, and the like.

Further, it is possible to maximize applying and printing performance.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention will now be described in detail with reference to certain exemplary embodiments thereof illustrated the accompanying drawings which are given hereinbelow by way of illustration only, and thus are not limitative of the present invention, and wherein:

FIG. 1 is a schematic perspective view illustrating a liquid spraying apparatus according to an exemplary embodiment of the present invention;

FIG. 2 is a schematic perspective view illustrating a state in which the liquid spraying apparatus according to the exemplary embodiment of the present invention is located on an inner wall of a building;

FIG. 3 is a schematic perspective view for describing a process of applying a liquid on the inner wall of the building by the liquid spraying apparatus according to the exemplary embodiment of the present invention;

FIG. 4 is a schematic cross-sectional view taken along line AA of FIG. 1; and

FIG. 5 is a schematic cross-sectional view taken along line AA of FIG. 1 for describing a reapplying function of the liquid spraying apparatus according to the exemplary embodiment of the present invention.

DETAILED DESCRIPTION

An exemplary embodiment of the present invention provides a liquid spraying apparatus as an apparatus which sprays a liquid on a target surface to apply an outer wall or an inner wall of a building or print various images, the liquid spraying apparatus including: a frame; a spraying unit which is movably mounted on the frame and sprays the liquid on the target surface; and a scattering prevention unit which is disposed in front of the spraying unit to prevent scattering of the liquid sprayed by the spraying unit, in which the scattering prevention unit absorbs the liquid sprayed by the spraying unit to prevent scattering of the liquid.

Hereinafter, exemplary embodiments of the present invention will be described in more detail with reference to the accompanying drawings. However, the spirit of the present invention is not limited to exemplary embodiments to be described, and those skilled in the art understanding the spirit of the present invention can easily propose other degenerative inventions or other exemplary embodiments included within the scope of the present invention by adding, changing, and deleting other components in the same scope, but will be included in the scope of the present invention.

Further, in the following description, the same reference numerals are used to designate components having the same function in the same scope illustrated in the drawing of each exemplary embodiment.

FIG. 1 is a schematic perspective view illustrating a liquid spraying apparatus according to an exemplary embodiment of the

present invention, FIG. 2 is a schematic perspective view illustrating a state in which the liquid spraying apparatus according to the exemplary embodiment of the present invention is located on an inner wall of a building, and FIG. 3 is a schematic perspective view for describing a process of applying a liquid on the inner wall of the building by the liquid spraying apparatus according to the exemplary embodiment of the present invention.

In addition, FIG. 4 is a schematic cross-sectional view taken along line AA of FIG. 1.

Referring to FIGS. 1 to 4, a liquid spraying apparatus 100 according to an exemplary embodiment of the present invention may be a kind of automatic applying/printing apparatus which sprays a liquid containing paints, ink, and the like on a target surface of an outer wall or a target surface of an inner wall of a building to apply the target surface or print various images such as figures, characters, symbols, logos, and the like.

Herein, the target surface may be at least a partial surface of the outer wall or the inner wall of the building, that is, may refer to a surface to be applied or a surface to be printed with the image.

Further, the liquid spraying apparatus 100 may be a kind of automatic cleaning apparatus capable of automatically cleaning the target surface of the outer wall or the target surface of the inner wall by spraying the liquid containing water, a cleaner, or the like on the target surface of the outer wall or the target surface of the inner wall of the building.

When the target surface of the outer wall of the building needs to be applied with the liquid or the image needs to be printed on

the target surface of the outer wall, the liquid spraying apparatus 100 may be moved to a position of the target surface by a crane, a winch drum installed on a rooftop of the building, or the like. In addition, when the target surface of the inner wall of the building needs to be applied with the liquid or the image needs to be printed on the target surface of the inner wall, as illustrated in FIG. 2, the liquid spraying apparatus 100 may be moved to a desired position automatically or manually by a wheel in contact with the ground.

The liquid spraying apparatus 100 may include a position guiding unit 105 contacting the outer wall or the inner wall of the building so as to be located at a desired accurate position based on the target surface, and the position guiding unit 105 may be stretched and contracted.

The position guiding unit 105 may include an elastic member having predetermined elasticity.

In addition, the position guiding unit 105 may also be implemented to be detachably mounted on the target surface using a vacuum state by a vacuum pump (not illustrated).

The liquid spraying apparatus 100 may include a frame 110 serving as a whole supporter, a spraying unit 120 spraying the liquid on the target surface, and a scattering prevention unit 130 preventing scattering of the liquid sprayed by the spraying unit 120.

Herein, the spraying unit 120 may include at least one nozzle and the liquid may be supplied from a liquid storage unit in which the liquid is stored to be sprayed on the target surface at a high pressure.

The spraying of the liquid by the spraying unit 120 may be implemented by a compressed air unit that supplies compressed air to provide spraying force, and the pressure of the compressed air may be adjusted by a pressure adjusting unit and as a result, the spraying force of the liquid by the spraying unit 120 may also be adjusted.

Moisture of the liquid supplied from the liquid storage unit to the spraying unit 120 may be removed by a moisture removing unit and as a result, the liquid sprayed from the spraying unit 120 may be prevented from flowing down from the target surface.

Meanwhile, the liquid spraying apparatus 100 according to the present invention may further have a constant temperature and/or humidity function or the like in order to improve performance of application and printing by the liquid sprayed from the at least one nozzle.

The constant temperature function may be implemented by a temperature sensor which is located in an internal space provided by a periphery of the nozzle, for example, a mounting frame 116 to be described below to sense a temperature around the nozzle.

In addition, the constant humidity function may be implemented by a humidity sensor which is located in an internal space provided by the periphery of the nozzle, for example, the mounting frame 116 to sense humidity around the nozzle.

If the temperature sensor senses that the temperature around the nozzle is in an abnormal state, a cooling means or a heating means may be operated so that the temperature around the nozzle may be returned to a normal state, and the cooling means or the heating means may be a known means, for example, a thermoelectric

element such as a Peltier element, a heat dissipation element, a fan, and the like.

In addition, if the humidity sensor senses that the humidity around the nozzle is in an abnormal state, a dehumidifying means or a humidifying means may be operated so that the humidity around the nozzle may be returned to a normal state, and the dehumidifying means or the humidifying means may be applied as a known means.

On the other hand, a series of processes for implementing the constant temperature function and/or the constant humidity function may be implemented automatically and in real time by a control unit (not illustrated). The frame 110 may provide an external appearance of the liquid spraying apparatus 100 and may include a horizontal support frame 112, a vertical support frame 114, a longitudinal support frame (not illustrated), and a mounting frame 116 on which the scattering prevention unit 130 is mounted.

The horizontal support frame 112 may be a kind of track for supporting and implementing movement in a horizontal direction D1 of the spraying unit 120.

The horizontal support frame 112 may be surrounded by the mounting frame 116 and define a limitation on the movement in the horizontal direction D1 of the spraying unit 120.

Since the mounting frame 116 surrounds the horizontal support frame 112, the mounting frame 116 also defines a limitation on the movement in the horizontal direction D1 of the spraying unit 120.

The spraying unit 120 may spray the liquid on the target surface while moving in the horizontal direction D1 along the horizontal support frame 112.

Herein, the movement of the horizontal support frame 112 of the spraying unit 120 may be implemented by a power supply unit (not illustrated) such as a motor or the like, and may be implemented when power is transmitted through components such as various gears.

Of course, the power supply of the power supply unit for moving the spraying unit 120 along the horizontal support frame 112 may be automatically controlled by a control unit (not illustrated) or the like.

The vertical support frame 114 may be a kind of track for supporting and implementing movement of the horizontal support frame 112 so as to implement movement in a vertical direction D2 of the spraying unit 120.

Herein, the mounting frame 116 may be mounted movably on the vertical support frame 114, but the present invention is not necessarily limited thereto, and the horizontal support frame 112 in the mounting frame 116 may be mounted movably on the vertical support frame 114.

The movement of the vertical support frame 114 of the mounting frame 116 may be implemented by a power supply unit (not illustrated) such as a motor or the like, and may be implemented when power is transmitted through components such as various gears.

Of course, the power supply of the power supply unit for moving the mounting frame 116 along the vertical support frame 114 may be automatically controlled by a control unit (not illustrated) or the like.

The longitudinal support frame may be a kind of track for supporting and implementing the movement in a longitudinal direction D3 of the spraying unit 120.

Herein, the movement of the longitudinal support frame of the spraying unit 120 may be implemented by a power supply unit (not illustrated) such as a motor or the like, and may be implemented when power is transmitted through components such as various gears.

Of course, the power supply of the power supply unit for moving the spraying unit 120 along the longitudinal support frame may be automatically controlled by a control unit (not illustrated) or the like.

As the mounting frame 116 or the horizontal support frame 112 are moved on the vertical support frame 114 in the vertical direction D2, the spraying unit 120 spraying the liquid while moving in the vertical direction D2 in association therewith may be automatically moved in the longitudinal direction D3 based on the degree of bending of the target surface and may be automatically controlled by the control unit.

In addition, when the spraying unit 120 sprays the liquid while moving in the horizontal direction D1 along the horizontal support frame 112, the spraying unit 120 may be automatically position-shifted in the longitudinal direction D3 based on the degree of bending of the target surface and may be automatically controlled by the control unit.

Meanwhile, the movement in the longitudinal direction D3 of the spraying unit 120 may also be manually implemented.

As described above, the spraying unit 120 sprays the liquid on the target surface while moving in the horizontal direction D1, the vertical direction D2, and the longitudinal direction D3 as illustrated in FIG. 3.

The mounting frame 116 may be formed in a kind of polyprism box shape, for example, a rectangular column box shape and may be moved in the vertical direction D2 by interlocking with the movement in the vertical direction D2 of the horizontal support frame 112.

The front side of the mounting frame 116 may be opened so that a liquid L sprayed by the spraying unit 120 is directly sprayed on the target surface, and the scattering prevention unit 130 is disposed in front of the spraying unit 120 to prevent the scattering of the liquid sprayed by the spraying unit 120.

The scattering prevention unit 130 may prevent the scattering of the liquid L by absorbing the liquid L sprayed by the spraying unit 120 as illustrated in FIG. 4.

The scattering prevention unit 130 may be formed by a cylindrical sponge and rotated by contacting the target surface.

A part of the scattering prevention unit 130 may be located in a spraying range R of the liquid L sprayed by the spraying unit 120 and the entire scattering prevention unit 130 may also be located in the spraying range R of the liquid L sprayed by the spraying unit 120.

In other words, at least a part of the scattering prevention unit 130 may be located in the spraying range R of the liquid L sprayed by the spraying unit 120.

Alternatively, a part of the scattering prevention unit 130 may be located beyond the spraying range R of the liquid L sprayed by the spraying unit 120 and the entire scattering prevention unit 130 may also be located beyond the spraying range R of the liquid L sprayed by the spraying unit 120.

In other words, at least a part of the scattering prevention unit 130 may be located beyond the spraying range R of the liquid L sprayed by the spraying unit 120.

The scattering prevention unit 130 may include a first scattering prevention unit 132 and a second scattering prevention unit 134 which are disposed at upper and lower sides of the spraying unit 120, respectively.

The first scattering prevention unit 132 may prevent the liquid sprayed by the spraying unit 120 from be scattered upwardly and the second scattering prevention unit 134 may prevent the liquid sprayed by the spraying unit 120 from be scattered downwardly.

Herein, the first scattering prevention unit 132 and the second scattering prevention unit 134 may be spaced apart from each other so as to form a spraying space S for directly spraying the liquid sprayed by the spraying unit 120 on the target surface.

The first scattering prevention unit 132 and the second scattering prevention unit 134 may be formed by cylindrical sponges as described above and may be rotated based on the mounting frame 116 by contacting the target surface.

That is, the first scattering prevention unit 132 and the second scattering prevention unit 134 may be rolled by contacting the target surface during the movement in the vertical direction D2 of the mounting frame 116, the horizontal support frame 112, or the spraying unit 120.

In other words, the first scattering prevention unit 132 and the second scattering prevention unit 134 may be moved in the vertical direction by interlocking with the movement in the vertical direction of the spraying unit 120.

Meanwhile, the first scattering prevention unit 132 and the second scattering prevention unit 134 may have a width corresponding to a width in the horizontal direction D1 of the mounting frame 116.

In addition, the first scattering prevention unit 132 and the second scattering prevention unit 134 may be located on the mounting frame 116 so as to further protrude forward than the mounting frame 116.

The reason is that the first scattering prevention unit 132 and the second scattering prevention unit 134 are formed by the sponges to contact the target surface and then slightly contracted, thereby preventing the mounting frame 116 from contacting the target surface.

Meanwhile, sides of the first scattering prevention unit 132 and the second scattering prevention unit 134 may be closed to prevent the liquid sprayed by the spraying unit 120 from being scattered.

In particular, the first scattering prevention unit 132 and the second scattering prevention unit 134 may be rotatably mounted on an inner surface of a side wall 117 of the mounting frame 116, and as a result, the sides of the first scattering prevention unit 132 and the second scattering prevention unit 134 may be closed by the side wall 117.

Further, a side of the spraying space S formed between the first scattering prevention unit 132 and the second scattering prevention unit 134 may be closed to prevent the liquid sprayed by the spraying unit 120 from being scattered.

Particularly, as illustrated in the drawing, the side of the spraying space S may be closed by the side wall 117.

If the first scattering prevention unit 132 and the second scattering prevention unit 134 are not mounted on the inner surface of the side wall 117 of the mounting frame 116 and rotatably mounted on the front side of the side wall 117 of the mounting frame 116, the side of the spraying space S may be closed by a separate component, for example, a separate sponge or a separate blocking wall, or may be closed by changing a shape of the side wall 117, for example, by changing the shape to a "T" shape protruding toward the spraying space S.

Meanwhile, the scattering prevention unit 130 including the first scattering prevention unit 132 and the second scattering prevention unit 134 may be position-shifted based on the mounting frame 116 of the frame 110 to change a positional relationship with the spraying unit 120.

The first scattering prevention unit 132 and the second scattering prevention unit 134 may be moved to optimal positions by considering the spraying range R according to spraying force of the spraying unit 120 and there is no limitation to a means for implementing the positional movement.

Meanwhile, although not illustrated, a plurality of spraying units 120 may be implemented.

For example, the spraying unit 120 may include a first spraying unit and a second spraying unit which are disposed in the vertical direction D2, and the first spraying unit and the second spraying unit may be mounted on the horizontal support frame 112

so as to be independently movable on the horizontal support frame 112 of the frame 110.

Of course, in this case, a plurality of horizontal support frames 112 may be disposed in the vertical direction D2, but the present invention is not necessarily limited thereto, and one horizontal support frame 112 may be implemented so that the first spraying unit and the second spraying unit are movable in the horizontal direction D1.

In addition, the positions of the first scattering prevention unit 132 and the second scattering prevention unit 134 may be adjusted by considering the spraying range of the first spraying unit and the spraying range of the second spraying unit.

FIG. 5 is a schematic cross-sectional view taken along line AA of FIG. 1 for describing a reapplying function of the liquid spraying apparatus according to the exemplary embodiment of the present invention.

Referring to FIG. 5, the liquid spraying apparatus 100 according to the exemplary embodiment of the present invention may implement a reapplying function, thereby maximizing performance of the application.

Hereinafter, the reapplying function of the liquid spraying apparatus 100 according to the exemplary embodiment of the present invention will be described by referring to the scattering prevention unit 130 described with reference to FIGS. 1 to 4 as an applying unit 130.

In addition, hereinafter, it should be understood that a component described as the applying unit 130 includes all features such an object, a configuration, an effect, and the like of the

scattering prevention unit 130 described with reference to FIGS. 1 to 4.

The spraying unit 120 may spray a first liquid L1 on a target surface as illustrated in FIG. 5A and in this case, the applying unit 130 absorbs a second liquid L2.

Herein, the first liquid L1 is a concept including the whole liquid sprayed by the spraying unit 120 and the second liquid L2 may be a concept meaning a liquid in which a part of the first liquid L1 sprayed from the spraying unit 120 is not directly sprayed on the target surface, but sprayed on the applying unit 130 to be absorbed by the applying unit 130.

The applying unit 130 may include a first applying unit 132 and a second applying unit 134 which are disposed at upper and lower sides of the spraying unit 120, and the first applying unit 132 and the second applying unit 134 may be formed by cylindrical sponges and rotatably mounted on the mounting frame 116.

The applying unit 130 may apply the second liquid L2 absorbed after absorbing the second liquid L2 on the target surface, and as a result, the target surface is directly sprayed with the remainder except for the second liquid L2 of the first liquid L1 sprayed from the spraying unit 120 to be primarily applied as illustrated in FIG. 5A and then secondarily applied by the absorbed second liquid L2 as illustrated in FIG. 5B.

For convenience of the description, when a part of the target surface is defined as a first target surface X, as illustrated in FIG. 5A, the first target surface X is directly sprayed with a remainder except for the second liquid L2 of the liquid sprayed

by the spraying unit 120, that is, the first liquid L1 to be primarily applied.

Thereafter, when the spraying unit 120 is moved in the vertical direction D2, that is, a downward direction D2' as illustrated in FIG. 5B, the first applying unit 132 is moved to the first target surface X while rotating by contacting the target surface to secondarily apply the first target surface X.

Of course, when the spraying unit 120 is moved in the downward direction D2' to be located at a position illustrated in FIG. 5A, the first target surface X is first applied by the second applying unit 134.

Through the above series of processes, the target surface may be applied by the applying unit 130 many times, thereby maximizing the performance of application.

In addition, the applying unit 130 which is first applied on a specific target surface may vary according to the movement direction of the spraying unit 120.

As described above, the configurations and the features of the present invention are described based on the exemplary embodiments of the present invention, but the present invention is not limited, and it will be apparent to those skilled in the art that various changes or modifications can be made within the scope of the present invention, and therefore, these changes or modifications are included within the scope of the appended claims.

Claims

1. A liquid spraying apparatus which sprays a liquid on a target surface, the liquid spraying apparatus comprising:

a frame;

a spraying unit which is movably mounted on the frame and sprays the liquid on the target surface; and

a scattering prevention unit which is disposed in front of the spraying unit to prevent scattering of the liquid sprayed by the spraying unit,

wherein the scattering prevention unit absorbs the liquid sprayed by the spraying unit to prevent scattering of the liquid.

2. The liquid spraying apparatus of claim 1, wherein at least a part of the scattering prevention unit is located in a spraying range of the liquid sprayed by the spraying unit.

3. The liquid spraying apparatus of claim 1, wherein the scattering prevention unit is formed by a cylindrical sponge.

4. The liquid spraying apparatus of claim 1, wherein at least a part of the scattering prevention unit is located beyond a spraying range of the liquid sprayed by the spraying unit.

5. The liquid spraying apparatus of claim 1, wherein the scattering prevention unit includes a first scattering prevention unit and a second scattering prevention unit which are disposed at upper and lower sides of the spraying unit, and

the first scattering prevention unit and the second scattering prevention unit are spaced apart from each other to form a spraying space for directly spraying the liquid sprayed by the spraying unit on the target surface.

6. The liquid spraying apparatus of claim 5, wherein a side of the spraying space is closed so as to prevent the liquid sprayed by the spraying unit from being scattered.

7. The liquid spraying apparatus of claim 5, wherein the first scattering prevention unit and the second scattering prevention unit are formed by cylindrical sponges and rotatable.

8. The liquid spraying apparatus of claim 7, wherein the first scattering prevention unit and the second scattering prevention unit are rotated by contact with the target surface.

9. The liquid spraying apparatus of claim 7, wherein sides of the first scattering prevention unit and the second scattering prevention unit are closed so as to prevent the liquid sprayed by the spraying unit from being scattered.

10. The liquid spraying apparatus of claim 1, wherein the scattering prevention unit is moved in a vertical direction by interlocking with the vertical movement of the spraying unit.

11. The liquid spraying apparatus of claim 1, wherein the scattering prevention unit is position-shifted based on the frame to change a positional relationship with the spraying unit.

12. The liquid spraying apparatus of claim 1, wherein the frame includes a horizontal support frame supporting a horizontal movement of the spraying unit, a vertical support frame supporting a vertical movement of the horizontal support frame so that the vertical movement of the spraying unit is implemented, and a mounting frame on which the scattering prevention unit is mounted, and

the mounting frame is moved in a vertical direction by interlocking with the vertical movement of the horizontal support frame.

13. The liquid spraying apparatus of claim 12, wherein the mounting frame surrounds the horizontal support frame and defines a limitation on the horizontal movement of the spraying unit.

14. The liquid spraying apparatus of claim 13, wherein the scattering prevention unit has a width corresponding to a width in the horizontal direction of the mounting frame.

15. The liquid spraying apparatus of claim 12, wherein the scattering prevention unit is located so as to further protrude forward than the mounting frame.

16. The liquid spraying apparatus of claim 1, wherein the spraying unit includes a first spraying unit and a second spraying unit which are disposed in a vertical direction, and

the first spraying unit and the second spraying unit are mounted on the frame to be independently movable.