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LAUNDRY TREATING APPARATUS

Abstract

A laundry treating apparatus includes a cabinet having a cover and a laundry inlet extending through the cover, a tub disposed inside the cabinet to provide a space for storing water, a drum that is rotatably disposed inside the tub and stores laundry introduced into the laundry inlet therein, a mounting portion including a hub fixed to the cover, and a first mounting groove and a second mounting groove facing each other along a width direction of the cover with the hub interposed therebetween, a first detergent box that stores detergent supplied to the tub and is slidable toward the hub from an edge of the first mounting groove along the width direction of the cover, and a second detergent box that stores the detergent supplied to the tub and is slidable toward the hub from an edge of the second mounting groove along the width direction of the cover.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS [0001] This application is the National Phase of PCT International Application No. PCT/KR2022/019916, filed on Dec. 8, 2022, which claims priority under 35 U.S.C. 119 (a) to Patent Application No. 10-2022-0150763, filed in the Republic of Korea on Nov. 11, 2022, all of which are hereby expressly incorporated by reference into the present application.

TECHNICAL FIELD
[0002] The present disclosure relates to a laundry treating apparatus.
BACKGROUND
[0003] A laundry treating apparatus that removes dirt from an object-to-be-washed (laundry or the like) using water includes a tub in which water is stored, a drum rotatably disposed inside the tub and storing the laundry therein, a water supply that supplies water to the tub, and a drainage that drains water stored in the tub.
[0004] For easy removal of the dirt, among existing laundry treating apparatuses, there was one that is equipped with a detergent supply apparatus that supplies detergent to the tub. Among the existing detergent supply apparatuses, there was one that includes a drawer extendable from a cabinet of the laundry treating apparatus, and a detergent passage defined in the drawer to guide the detergent to the tub.
[0005] In the existing detergent supply apparatus described above, the water supply supplies water to the detergent passage. Therefore, when the water supply is operated, the detergent introduced into the detergent passage was supplied to the tub along with water (Publication number 10-2020-0007549). However, the detergent supply apparatus described above had a possibility of injecting more detergent than necessary, and there was an inconvenience in that a user has to inject the detergent into the detergent passage every time washing is necessary.
[0006] To solve the above-mentioned shortcomings, among the existing detergent supply apparatuses, there was one that automatically supplies the detergent to the tub during the washing.
[0007] The existing automatic detergent supply apparatus includes a detergent box (also known as a cartridge) that is detachable from the laundry treating apparatus and provides a space for storing the detergent, and a transferrer that transfers the detergent to the tub when the cartridge is mounted in the laundry treating apparatus.
[0008] The automatic detergent supply apparatus described above may store a relatively great amount of detergent in the cartridge, and a controller may adjust an operating time point and an operating time duration of the transferrer, so that not only an appropriate amount of detergent may be supplied to the tub, but also an inconvenience of the user supplying the detergent to the tub when the washing is necessary may be solved.
[0009] It was general that the cartridge disposed in the existing automatic detergent supply apparatus is extended from the cabinet of the laundry treating apparatus. That is, conventionally, the cartridge had a structure of being extended from a casing fixed to the cabinet to be located under the tub, a casing fixed to the cabinet to be located on the tub, or a casing fixed to a top surface of the cabinet and exposed to the outside of the laundry treating apparatus (Publication number 10-2018-0096008, Publication number 10-2020-0120202).

[0010] Because great vibrations may be intermittently transmitted to the cabinet when the laundry treating apparatus operates, the casings fixed inside the cabinet to be located under the tub and on the tub have a low risk of the cartridge being extended from the cabinet.
[0011] However, because the cartridge disposed in the casing exposed to the outside of the cabinet is highly likely to be separated from the casing when the laundry treating apparatus vibrates, the existing automatic detergent supply apparatuses had a structure in which the casing surrounds all surfaces excluding one surface of the cartridge.
[0012] That is, the existing casing had a structure that surrounds a top surface, both side surfaces, and a rear surface of the cartridge, excluding a front surface where an outlet of the cartridge is disposed. This is to minimize the risk of the cartridge being separated from the case by the vibration.
[0013] However, the structure in which only one surface of the cartridge is exposed to the outside of the casing had inconvenience of requiring the user to extend the cartridge from the casing to supply the detergent to the cartridge or check a remaining amount of detergent.
[0014] In addition, the automatic detergent supply apparatus had a structural limitation that it is difficult to increase a volume of the cartridge when applied to a top-loading laundry treating apparatus.
[0015] The top-loading laundry treating apparatus is a laundry treating apparatus that puts the laundry into the drum via a laundry inlet defined in the top surface of the cabinet. Because the laundry inlet is located at a center of a space provided by the top surface of the cabinet, the cartridge had to be installed in a space other than the space where the laundry inlet is located.
[0016] That is, the casing had to be installed in a space located in front of the laundry inlet or a space located at the rear of the laundry inlet among spaces provided by the top surface of the cabinet, and the cartridge was inserted into the casing by moving rearwards from the space in front of the laundry inlet (Publication number 10-2018-0080013).
[0017] However, the rear space of the cabinet top surface has a vertical length (a length of the cabinet in a depth direction, a length of the rear space parallel to a cartridge insertion direction) smaller than a horizontal length (a length of the cabinet in a width direction), and the transferrer (a pump or the like) that transfers the detergent of the cartridge to the tub must be installed inside the casing, so that it was difficult for the existing automatic detergent supply apparatus to design the cartridge to have a great storage capacity.

SUMMARY

Technical Problem

[0018] The present disclosure is to provide a laundry treating apparatus equipped with a detergent supply that is mounted in a state of being exposed to the outside of a cabinet.
[0019] In addition, the present disclosure is to provide a laundry treating apparatus equipped with a detergent supply that may not only store a great amount of detergent, but also minimize a risk of separation from a cabinet by vibration.
[0020] In addition, the present disclosure is to provide a laundry treating apparatus that may introduce detergent into a detergent supply mounted on a cabinet.
[0021] In addition, the present disclosure is to provide a laundry treating apparatus that may check a remaining amount of detergent without removing a detergent supply from a cabinet.

Technical Solutions

[0022] Provided is a laundry treating apparatus including a cabinet having a cover forming a top surface and a laundry inlet extending through the cover, a tub disposed inside the cabinet to provide a space for storing water, a drum that is rotatably disposed inside the tub and stores laundry introduced into the laundry inlet therein, a mounting portion including a hub fixed to the cover, and a first mounting groove and a second mounting groove provided to face each other along a width direction of the cover with the hub interposed therebetween, a first detergent box that stores detergent to be supplied to the tub and is slidable toward the hub from an edge of the first mounting

groove along the width direction of the cover, and a second detergent box that stores the detergent to be supplied to the tub and is slidable toward the hub from an edge of the second mounting groove along the width direction of the cover.
[0023] The mounting portion may include a first fastening pipe protruding from the hub along the width direction of the cover and connecting the tub with the first detergent box, and a second fastening pipe protruding from the hub along the width direction of the cover and connecting the tub with the second detergent box.
[0024] The first detergent box may include a first storage body where the detergent is stored, and a first detergent discharge port where the first fastening pipe is inserted when the first storage body is inserted into the first mounting groove along the width direction of the cover, and the second detergent box may include a second storage body where the detergent is stored, and a second detergent discharge port where the second fastening pipe is inserted when the second storage body is inserted into the second mounting groove along the width direction of the cover.
[0025] The first storage body may be restricted from moving in a height direction of the cover and a front and rear direction of the cover when the first fastening pipe is inserted into the first detergent discharge port, and the second storage body may be restricted from moving in the height direction of the cover and the front and rear direction of the cover when the second fastening pipe is inserted into the second detergent discharge port.
[0026] The laundry treating apparatus may further include a first withdrawal prevention portion preventing the first fastening pipe from being withdrawn from the first detergent discharge port when the first fastening pipe is inserted into the first detergent discharge port, and a second withdrawal prevention portion preventing the second fastening pipe from being withdrawn from the second detergent discharge port when the second fastening pipe is inserted into the second detergent discharge port.
[0027] The first withdrawal prevention portion may restrict the first storage body from moving in a direction away from the hub along the width direction of the cover, and the second withdrawal prevention portion may restrict the second storage body from moving in the direction away from the hub along the width direction of the cover.
[0028] The first storage body may be constructed such that at least two surfaces thereof are exposed to the outside of a first mounting space, and the second storage body may be constructed such that at least two surfaces thereof are exposed to the outside of a second mounting space.
[0029] At least one of the surfaces exposed to the outside of the first mounting groove of the first storage body may be entirely or partially made of a transparent material.
[0030] At least one of the surfaces exposed to the outside of the second mounting groove of the second storage body may be entirely or partially made of a transparent material.
[0031] The laundry treating apparatus may further include a first detergent inlet defined in a surface of the first storage body located outside the first mounting groove to enable introduction of the detergent into the first storage body, and a second detergent inlet defined in a surface of the second storage body located outside the second mounting groove to enable introduction of the detergent into the second storage body.
[0032] The first detergent inlet may be defined in a top surface of the first storage body parallel to the cover, and the first detergent discharge port may be disposed on a surface of the first storage body facing the hub, and the second detergent inlet may be defined in a top surface of the second storage body parallel to the cover, and the second detergent discharge port may be disposed on a surface of the second storage body facing the hub.
[0033] The laundry treating apparatus may further include a transferrer that transfers the detergent introduced into the first fastening pipe and the second fastening pipe to the tub.
[0034] The laundry treating apparatus may further include a tub inlet defined in the tub to be located under the laundry inlet, a water supply passage including a passage body fixed to the cabinet, and a chamber that is disposed inside the passage body and guides water supplied from a

water supply source to the tub inlet, and a transferrer that guides the detergent introduced into the first fastening pipe and the second fastening pipe to the chamber.
[0035] The laundry treating apparatus may further include a drawer extendable from the chamber, and a detergent passage that is defined in the drawer and guides the detergent supplied to the drawer into the chamber.
[0036] The laundry treating apparatus may further include a connection chamber protruding from one surface of the passage body in an insertion direction of the drawer or in a direction perpendicular to the insertion direction of the drawer, wherein the connection chamber is in communication with the chamber, and the transferrer may include a first transferrer that moves the detergent introduced into the first fastening pipe to the connection chamber, and a second transferrer that moves the detergent introduced into the second fastening pipe to the connection chamber.
[0037] The laundry treating apparatus may further include a distributer disposed inside the chamber and located on the drawer, wherein the distributer guides some of water introduced into the chamber to the detergent passage and guides the rest to the connection chamber.
Advantageous Effects
[0038] The present disclosure provides the laundry treating apparatus equipped with the detergent supply that is mounted in the state of being exposed to the outside of the cabinet.
[0039] In addition, the present disclosure provides the laundry treating apparatus equipped with the detergent supply that may not only store the great amount of detergent, but also minimize the risk of separation from the cabinet by the vibration.
[0040] In addition, the present disclosure may provide the laundry treating apparatus that may introduce the detergent into the detergent supply mounted on the cabinet.
[0041] In addition, the present disclosure may provide the laundry treating apparatus that may check the remaining amount of detergent without removing the detergent supply from the cabinet.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0042] FIGS. **1** and **2** show an example of a laundry treating apparatus.
[0043] FIG. **3** shows an example of an internal structure of a laundry treating apparatus.
[0044] FIG. **4** shows an example of a detergent supply disposed in a laundry treating apparatus.
[0045] FIG. **5** shows an example of an automatic detergent supply (a second supply).
[0046] FIGS. **6** and **7** show an example of a first detergent box disposed in a second supply.
[0047] FIGS. **8** and **9** show an example of a second detergent box disposed in a second supply.
[0048] FIG. **10** shows an example of a mounting portion.
[0049] FIG. **11** shows a combined structure of a detergent box and a mounting portion.
[0050] FIG. **12** shows an example of a transferrer.
[0051] FIGS. **13**, **14**, and **15** show an example of a water supply passage and a manual detergent supply (a first supply).
[0052] FIG. **16** shows a passage through which detergent is supplied to a tub.
DETAILED DESCRIPTION
[0053] Hereinafter, a preferred embodiment of a laundry treating apparatus and a method for controlling the same will be described in detail with reference to the attached drawings.
[0054] As shown in FIG. **1**, a laundry treating apparatus **100** includes a cabinet **1**, and treating portions **2** and **3** that are defined inside the cabinet to provide a space for receiving laundry.
[0055] As shown in FIG. **2**, the cabinet **1** may include a housing **11** that provides a space in which the treating portions are accommodated, and a cover **12** that closes an open top surface of the housing.

[0056] The cover **12** may include a cover body **121** fixed to the housing **11** to form a top surface of the laundry treating apparatus, and a laundry inlet **124** defined to extend through the cover body **121**. The laundry inlet **124** may be closed by a door **13** pivotably coupled to the cover body **121**.
[0057] The cover body **121** may include a front space (first space) **122** located in front of the laundry inlet **124**, and a rear space (second space) **123** located at the rear of the laundry inlet **124**. The front space **122** may have a control panel **125**, and the control panel **125** may include an input device **126** that receives a control command from a user, and a display **127** that displays information related to the laundry treating apparatus.
[0058] As shown in FIG. **3**, the treating portion may include a tub **2** in which water is stored, and a drum **3** disposed inside the tub and storing an object-to-be-washed (the laundry and the like) supplied through the laundry inlet **124**.
[0059] Because the tub **2** must be formed in a structure capable of storing water, the tub **2** may be formed as a cylindrical hollow tub body **21**.
[0060] The tub body **21** is fixed to the cabinet **1** via a tub support **23**. The tub support **23** may be formed as a bar having one end fixed to the cover **12** or the housing **11** and the other end fixed to a circumferential surface of the tub body **21**. A top surface of the tub body **21** has a tub inlet **22** located under the laundry inlet **124**.
[0061] The tub body **21** may receive water via a water supply S, and water inside the tub body **21** may be discharged to the outside of the cabinet **1** via a drainage **25**.
[0062] The water supply S may include a water supply pipe **4** connected to a water supply source, a water supply valve **5** that controls opening and closing of the water supply pipe **4** in response to a control signal of a controller (a first controller), and a water supply passage **6** that guides water supplied from the water supply pipe **4** into the tub **2**. FIG. **3** shows a case in which the water supply passage **6** guides water into the tub body **21** via the tub inlet **22**.
[0063] The drainage **25** may include a drain pipe **251** that guides water inside the tub body **21** to the outside of the cabinet **1**, and a drain valve **252** that controls opening and closing of the drain pipe in response to the control signal of the first controller.
[0064] The drum **3**, as a means that is located inside the tub body **21** and provides a space for storing the laundry, may be formed as a cylindrical hollow drum body **31**.
[0065] A top surface of the drum body **31** may have a drum inlet **32** located under the tub inlet **22**. Accordingly, the user may put the laundry into the drum body **31** via the laundry inlet **124**, the tub inlet **22**, and the drum inlet **32**. A communication hole **33** that allows the tub body **21** to be in communication with the inner space of the drum body **31** may be defined in a circumferential surface, a bottom surface, and the like of the drum body **31**.
[0066] An agitator **34** that is disposed to be rotatable inside the drum body and is able to form a water flow inside the drum body **31** may be further disposed on the bottom surface of the drum body **31**.
[0067] The drum body **31** and the agitator **34** are rotatable by a driver. The driver may include a motor **35** fixed to a bottom surface of the tub body **21** and located outside the tub body **21**, a drum shaft **36** that connects the motor with the drum body **31**, and an agitator shaft **37** that connects the motor with the agitator **34**.
[0068] The agitator shaft **37** may be disposed to extend through the drum shaft **36** and directly connect a rotor of the motor **35** with the agitator **34**. In this case, a gear **38** that connects the agitator shaft **37** with the drum shaft **36**, and a clutch **39** that controls connection between one end of the drum shaft **36** and the rotor may be disposed inside the drum shaft **36**.
[0069] As shown in FIG. **4**, the laundry treating apparatus **100** may have a detergent supply **7** and **8** for supplying detergent to the tub **2**.
[0070] The detergent supply may include a first supply (a manual detergent supply) **7** that receives the detergent from the user and supplies the detergent to tub **2**, and a second supply (an automatic detergent supply) **8** that supplies an appropriate amount of detergent to the tub **2** at a set time point

under control of the first controller.
[0071] The first supply **7** may be formed as a drawer **71** that may be extended from the water supply passage **6** defined in the cover **12**. The drawer **71** may be extended along a direction in which a center of the laundry inlet **124** is located (an +X-axis direction) from the water supply passage **6**.
[0072] The drawer **71** may include a first detergent passage **72** and a second detergent passage **74** that guide the detergent provided from the user to the water supply passage **6**.
[0073] The first detergent passage **72** and the second detergent passage **74** must define separate passages. The first detergent passage **72** may be connected to the water supply passage **6** via a first outlet **73**, and the second detergent passage **74** may be connected to the water supply passage **6** via a second outlet.
[0074] The first outlet **73** may be defined as a hole that extends through a rear surface of the first detergent passage **72**, and the second outlet may be defined as a siphon passage (or a water trap) that, when a certain amount or more of liquid (water or liquid detergent) is supplied to the second detergent passage **74**, discharges the liquid to the water supply passage **6**. In this case, the first detergent passage **72** will be able to be used as a supply passage of powder detergent or liquid detergent required for washing, and the second detergent passage **74** will be able to be used as a supply passage of liquid detergent or powder detergent introduced at a specific time (a rinsing cycle, a dehydration cycle, and the like).
[0075] As described above, the cover body **121** may include the front space **122** located in front of the laundry inlet **124**, and the rear space **123** located at the rear of the laundry inlet **124**. The second supply **8** may be located in the rear space **123**. Unlike as shown in the drawing, the control panel **125** may be disposed in the rear space **123** and the second supply **8** may be disposed in the front space **122**.
[0076] As shown in FIGS. **4** and **5**, the second supply **8** may include a detergent box **81** that provides a space for storing the detergent, a mounting portion **82** fixed to the rear space **123** and to which the detergent box **81** is detachably fixed, and a transferrer **83** that withdraws the detergent from the detergent box **81** coupled to the mounting portion **82** and allows the detergent to flow to the water supply passage **6**.
[0077] As shown in FIG. **5**, the detergent box **81** may include a first detergent box **81***a* and a second detergent box **81***b* that are detachably fixed to the mounting portion **82**.
[0078] The first detergent box **81***a* may include a storage body (a first storage body) **811** that provides a space for storing the detergent, a detergent inlet (a first detergent inlet) **812** defined to extend through one surface of the first storage body, and a detergent box door (a first detergent box door) **813** that may open and close the first detergent inlet.
[0079] As shown in FIG. **6**, the first detergent inlet **812** may be defined to extend through a top surface of the first storage body **811**, and the first detergent box door **813** may be pivotably fixed to a top surface of the storage body **811**.
[0080] As shown in FIG. **7**, a bottom surface of the first storage body **811** may have a detergent discharge port (a first detergent discharge port) **814**, and the first detergent discharge port **814** may have a check valve (a first check valve) **814***a*.
[0081] A bottom surface **814***c* of the first storage body **811** may have a guide passage (a first guide passage) **814***b* that guides the detergent inside the first storage body **811** to the first detergent discharge port **814**. In this case, the first detergent discharge port **814** may be located on a surface facing a direction in which a second storage body **815** is located (a surface facing a +Z-axis direction, a surface facing a hub of the mounting portion) in a space provided by the first guide passage **814***b*.
[0082] As shown in FIG. **8**, the second detergent box **81***b* may include the storage body (the second storage body) **815** that provides a space for storing the detergent, a detergent inlet (a second detergent inlet) **816** defined to extend through one surface of the second storage body, and a

detergent box door (a second detergent box door) **817** that may open and close the second detergent inlet.

[0083] The second detergent inlet **816** may be defined to extend through a top surface of the second storage body **815**, and the second detergent box door **817** may be pivotably fixed to the top surface of the second storage body **815**.

[0084] As shown in FIG. **9**, a bottom surface **818***c* of the second storage body **815** may include a detergent discharge port (a second detergent discharge port) **818**, and the second detergent discharge port **818** may have a check valve (a second check valve) **818***a*.

[0085] A bottom surface of the second storage body **815** may have a guide passage (a second guide passage) **818***b* that guides the detergent inside the second storage body **815** to the second detergent discharge port **818**. In this case, the second detergent discharge port **818** may have a surface facing a direction in which the first storage body **811** is located (a surface facing a −Z-axis direction, a surface facing the hub of the mounting portion) in a space provided by the second guide passage **818***b*.

[0086] As shown in FIG. **10**, the mounting portion **82** may include a mounting body **82***a* that is fixed to the cover body **121** and is located in the rear space **123** of the cover, and a hub **82***b* that is disposed on the mounting body **82***a* and to which the first detergent box **81***a* and the second detergent box **81***b* are fixed. FIG. **10** shows a case in which the hub **82***b* is positioned between the first detergent discharge port **814** and the second detergent discharge port **818** to fix the discharge ports **814** and **818** as an example.

[0087] The mounting body **82***a* has a first mounting space **821** and a second mounting space **822** arranged to face each other with the hub **82***b* interposed therebetween. The first mounting space **821** is a space where the first detergent box **81***a* is mounted, and the second mounting space **822** is a space where the second detergent box **81***b* is mounted.

[0088] The first mounting space **821** may be defined in a direction (a −Y-axis direction) away from the second mounting space **822** along a width direction of the cover body **121** from the hub **82***b*, and the second mounting space **822** may be defined in a direction (a +Y-axis direction) away from the first mounting space **821** along the width direction of the cover body **121** from the hub **82***b*.

[0089] The first mounting space **821** may be defined as a groove (a first mounting groove) in which the bottom surface of the first storage body **811** is accommodated, and the second mounting space **822** may be defined as a groove (a second mounting groove) in which the bottom surface of the second storage body **815** is accommodated.

[0090] For example, the first mounting space **821** may be defined as a groove that accommodates entire edges of the bottom surface of the first storage body **811**, and the second mounting space **822** may be defined as a groove that accommodates entire edges of the bottom surface of the second storage body **815**.

[0091] Additionally, a bottom surface of the first mounting space **821** and a bottom surface of the second mounting space **822** may be formed in a shape inclined downward toward the hub **82***b*. In this case, the bottom surface **814***c* or **818***c* of each of the storage bodies **811** and **815** is preferably inclined to correspond to a shape of the mounting space corresponding thereto.

[0092] The mounting portion **82** may include a first fastening pipe **823** that protrudes from the hub **82***b* in a direction away from the hub **82***b* (the −Y-axis direction) along the width direction of the cover body **121**, and a second fastening pipe **824** that protrudes in the direction away from the hub (the +Y-axis direction) along the width direction of the cover body **121**.

[0093] As shown in FIG. **11**, the first fastening pipe **823** may be inserted into the first detergent discharge port **814** of the first detergent box, and the second fastening pipe **824** may be inserted into the second detergent discharge port **818** of the second detergent box.

[0094] When the first detergent box **81***a* is inserted into the first mounting space **821**, the first fastening pipe **823** is inserted into the first detergent discharge port **814**, so that the first check valve **814***a* will open the first detergent discharge port **814**. When the second detergent box **81***b* is

inserted into the second mounting space **822**, the second fastening pipe **824** is inserted into the second detergent discharge port **818**, so that the second check valve **818***a* will open the second detergent discharge port **818**.

[0095] As shown in FIG. **12**, the transferrer **83** may include a first transferrer **83***a* that allows the detergent flowing into the first fastening pipe **823** to flow to the tub body **21**, and a second transferrer **83***b* that allows the detergent flowing into the second fastening pipe **824** to flow to the tub body **21**.

[0096] The first transferrer **83***a* may include a first detergent pump **831** mounted in the rear space **123** of the cover body, a first supply passage **832** that connects an inlet of the first detergent pump with the first fastening pipe **823**, and a first discharge passage **833** that connects an outlet of the first detergent pump with the water supply passage **6**.

[0097] The second transferrer **83***b* may include a second detergent pump **834** mounted in the rear space **123**, a second supply passage **835** that connects an inlet of the second detergent pump with the second fastening pipe **824**, and a second discharge passage **836** that connects an outlet of the second detergent pump with the water supply passage **6**.

[0098] Because an open top surface of the rear space **123** is closed by the mounting body **82***a*, the first transferrer **83***a* and the second transferrer **83***b* mounted in the rear space **123** are not exposed to the outside of the cover by the mounting body **82***a*.

[0099] In addition, the transferrers **83***a* and **83***b* are disposed so as not to interfere with the spaces where the detergent boxes **81***a* and **81***b* are mounted. That is, the first transferrer **83***a* and the second transferrer **83***b* are disposed in the rear space **123** independent of the mounting spaces **821** and **822** rather than at the rear of the two detergent boxes **81***a* and **81***b*, so that the laundry treating apparatus **100** is advantageous in designing the storage bodies **811** and **815** disposed in the respective detergent boxes to have a great volume.

[0100] The first controller mentioned above is means for controlling at least one of the input device **126**, the display **127**, the motor **35**, the water supply valve **5**, and the drain valve **252**. The first detergent pump **831** and the second detergent pump **834** that are disposed in the transferrer **83** may operate in response to the control signal of the first controller. However, as shown in FIG. **12**, the first detergent pump **831** and the second detergent pump **834** may operate in response to a control signal of a second controller (a pump controller) **9** separate from the first controller.

[0101] When the second controller **9** is separated from the first controller, the first controller and the second controller **9** must be connected to each other to enable communication therebetween, and the second controller **9** is desirable to control the two detergent pumps based on a control command (an operating time point and an operating time duration of the pump) requested by the first controller. The second controller **9** is preferably fixed inside the rear space **123**.

[0102] When the first controller and the second controller **9** are constructed as described above, the second supply **8** described above may be modularized (applicable to various laundry treating apparatuses with different structures) and a load of the first controller may be reduced, so that a possibility of operational errors in the laundry treating apparatus may be minimized.

[0103] As mentioned above, the water supply S may include the water supply pipe **4**, the water supply valve **5**, and the water supply passage **6**.

[0104] The water supply pipe **4** may include a first water supply pipe **41** connected to a water supply source that supplies water at a first temperature, and a second water supply pipe **42** connected to a water supply source that supplies water at a second temperature higher than the first temperature.

[0105] The first water supply pipe **41** may be branched into a first branch pipe and a second branch pipe via a branch unit **54**. In this case, the water supply valve **5** may be composed of a first valve **51** that controls opening and closing of the first branch pipe, a second valve **52** that controls opening and closing of the second branch pipe, and a third valve **53** that controls opening and closing of the second water supply pipe **42**.

[0106] As shown in FIG. **13**, the water supply passage **6** may include a passage body **61** that is fixed to the cabinet **1** via the cover body **121**, and a chamber **611** that is disposed in the passage body **61** and guides water supplied from the water supply pipe **4** to the tub inlet **22**. One surface (a surface facing the center of the laundry inlet or the like) of the passage body **61** has a chamber outlet **612** that discharges liquid flowed into the chamber **611** to the tub inlet **22**.
[0107] The chamber **611** is connected to the water supply valve **5** via an inlet **63**. The inlet **63** may include a first inlet port **634**, a second inlet port **635**, and a third inlet port **636** that are disposed on the passage body **61** and connected to an upper space of the chamber **611**.
[0108] As shown in FIG. **12**, the first inlet port **634** may be connected to the first valve **51** via a first valve connecting pipe **631**, the second inlet port **635** may be connected to the second valve **52** via a second valve connecting pipe **632**, and the third inlet port **636** may be connected to the third valve **53** via a third valve connecting pipe **633**.
[0109] As shown in FIG. **13**, the drawer **71** of the first supply may be extended from the chamber **611** via the chamber outlet **612**. In this case, the first outlet **73** and the second outlet of the drawer must discharge the detergent into the chamber **611**.
[0110] Furthermore, a passage through which the detergent or water may flow must be defined between a bottom surface **613** of the chamber **611** and a bottom surface of the drawer **71** such that the detergent discharged from the drawer **71** into the chamber **611** may flow to the tub **2**. FIG. **13** shows a case in which the chamber bottom surface **613** is formed as an inclined surface downwardly inclined toward the chamber outlet **612** to define the passage as an example.
[0111] The passage body **61** may further include a connection portion **84** that guides the detergent supplied from the transferrer **83** to the bottom surface **613** of the chamber.
[0112] The connection portion **84** may include a connection chamber **841** that protrudes from the passage body **61** and is in communication with the chamber **611**, a first detergent supply pipe **842** that connects the first discharge passage **833** of the transferrer to the connection chamber **841**, and a second detergent supply pipe **843** that connects the second discharge passage **836** of the transferrer to the connection chamber **841**.
[0113] The connection chamber **841** may protrude in a direction in which the drawer **71** is inserted (the −X-axis direction) or in a width direction of the drawer (the Y-axis direction, a direction perpendicular to a direction in which the drawer is inserted).
[0114] When the detergent stored in the detergent box **81** is supplied via a top surface of the chamber **611** rather than the connection chamber **841**, the detergent discharged from the transferrer **83** will be supplied to the tub **2** via the first detergent passage **72** or the second detergent passage **74** defined in the drawer **74** and the chamber bottom surface **613**. Because the flow path of the detergent as described above is longer than a path in which the detergent flows to the tub **2** via the connection chamber **841** and the chamber bottom surface **613**, a possibility that the detergent is not able to be entirely supplied to the tub and the detergent remains in the flow path increases. The connection chamber **841** is means of solving such problem.
[0115] Inside the chamber **611**, a distributer **62** that is located on the drawer **71** and guides water flowing into the chamber **611** to the first detergent passage **72** and the second detergent passage **74** of the drawer may be further disposed. The distributer **62** may guide some of water flowing into the chamber **611** to the detergent passages **72** and **74** and guide the remainder to the connection chamber **841**.
[0116] The distributer **62** may include a distribution body **621** fixed inside the chamber **611** and located on the drawer **71**, and a partition wall **622** that divides the distribution body **621** into a first distribution space **623** located on the first detergent passage **72** of the drawer and a second distribution space **625** located on the second detergent passage **74**.
[0117] As shown in FIG. **14**, the first distribution space **623** may have a first supply hole **624** extending through the first distribution space **623**, and the second distribution space **625** may have a second supply hole **626** extending through the second distribution space **625**.

[0118] Water discharged from the first water supply pipe **41** via the first valve **51** will be supplied to the first detergent passage **72** of the drawer via the first inlet port **634** and the first supply hole **624**, and water discharged from the first water supply pipe **41** via the second valve **52** will be supplied to the second detergent passage **74** of the drawer via the second inlet port **635** and the second supply hole **626**.
[0119] The distributer **62** may further include a guide **627** that facilitates flow of some of water supplied to the distribution body **621** toward the connection chamber **841**.
[0120] The guide **627** may be formed as a board extending from a rear end of the distribution body **621** toward the connection chamber **841**. In this case, the guide **627** may include a guide first through-hole **628** and a guide second through-hole **629**.
[0121] The guide first through-hole **628** is means for allowing the detergent discharged from the first detergent supply pipe **842** to flow to a bottom surface of the connection chamber **841** without interfering with the guide, and the guide second through-hole **629** is means for allowing the detergent discharged from the second detergent supply pipe **843** to flow to the bottom surface of the connection chamber **841** without interfering with the guide. As shown in the drawing, the guide second through-hole **629** may be defined as a groove in which a free end of the guide **627** is concavely bent.
[0122] As shown in FIG. **15**, the laundry treating apparatus equipped with the guide **627** is able to guide some of water flowing into the chamber **611** during water supply toward the connection chamber **841**, so that a possibility that the detergent remains on the bottom surface of the connection chamber **841** may be minimized (a set amount of detergent may be entirely supplied to the tub).
[0123] As shown in FIG. **16**, the laundry treating apparatus of the above-described structure supplies water to the drawer **71** via the water supply pipe **4** when the water supply valve **5** is operated, and the detergent inside the drawer **71** is supplied to the tub body **21** via the chamber outlet **612** after being discharged into the chamber **611** together with water.
[0124] In one example, the detergent stored in the detergent box **81** flows to the connection chamber **841** when the transferrer **83** is operated, and the detergent inside the connection chamber **841** is supplied to the tub body **21** via the chamber outlet **612**.
[0125] As shown in FIG. **1**, the laundry treating apparatus **100** described above has a structure in which the first detergent box **81***a* and the second detergent box **81***b* protrude from a top surface of the cover **12**.
[0126] Considering that a top surface of the top-loading laundry treating apparatus **100** is generally located higher than a top surface of a front-loading laundry treating apparatus, a vibration amplitude of the first detergent box **81***a* and the second detergent box **81***b* described above may be greater than that of a detergent box (a detergent storage space) located at an upper portion of the front-loading washing machine when the laundry treating apparatus **100** operates.
[0127] That is, when the drum **3** rotates, great vibrations may occur in the first detergent box **81***a* and the second detergent box **81***b*, so that when the two detergent boxes are not firmly fixed to the cabinet **1** via the mounting portion **82**, there is a possibility that the detergent boxes may be separated from the mounting portion **82** during the operation of the laundry treating apparatus **100**.
[0128] To minimize the above-mentioned risk, the first detergent box **81***a* is formed such that, when the first storage body **811** is inserted into the first mounting space **821** along the width direction of the cover **12** (the +Y-axis direction), the first fastening pipe **823** is coupled to the first detergent discharge port **814**.
[0129] When the first fastening pipe **823** is inserted into the first detergent discharge port **814**, a movement of the first storage body **811** in a height direction of the cover **12** (the Z-axis direction) and a depth direction of the cover **12** (the X-axis direction, a front and rear direction of the cover) is restricted, so that the laundry treating apparatus **100** may suppress vibrations in the two directions of the first detergent box **81***a* only with the locations of the first fastening pipe **823** and the first

detergent discharge port **814**.
[0130] In addition, in the laundry treating apparatus **100**, the first transferrer **83***a* that allows the detergent stored in the first detergent box **81***a* to flow to the tub is located in an external space of the mounting portion **82** (the rear space **123** of the cover), so that the volume of the first storage body **811** may be maximized.
[0131] The second detergent box **81***b* is formed such that, when the second storage body **815** is inserted into the second mounting space **822** along the width direction of the cover **12** (the −Y-axis direction), the second fastening pipe **824** is inserted into the second detergent discharge port **818**.
[0132] When the second fastening pipe **824** is inserted into the second detergent discharge port **818**, a movement of the second storage body **815** in the height direction of the cover **12** (the Z-axis direction) and the depth direction of the cover **12** (the front and rear direction of the cover, the X-axis direction) is restricted, so that the laundry treating apparatus may suppress vibrations in the two directions of the second detergent box **81***b* only with the locations of the second fastening pipe **824** and the second detergent discharge port **818**.
[0133] In addition, in the laundry treating apparatus **100**, the second transferrer **83***b* that allows the detergent stored in the second detergent box **81***b* to flow to the tub is located in the external space of the mounting portion **82** (the rear space **123** of the cover), so that the volume of the second storage body **815** may be maximized.
[0134] In one example, an edge of the first storage body **811** may be inserted into the first mounting space **821**, and an edge of the second storage body **815** may be inserted into the second mounting space **822**. Accordingly, the laundry treating apparatus **100** may also suppress the vibrations of each detergent box along the width direction (the Y-axis direction) and the depth direction (the X-axis direction) of the cover.
[0135] As shown in FIGS. **7** and **9**, to more effectively suppress the vibrations of the detergent boxes **81***a* and **81***b*, the second supply **8** may further include a fixing portion **85**. The fixing portion **85** may include a first withdrawal prevention portion **851** disposed on the first storage body **811** and a second withdrawal prevention portion **854** disposed on the second storage body **815**.
[0136] As shown in FIG. **7**, the first withdrawal prevention portion **851** may be formed to restrict the first detergent box **81***a* from moving along the width direction of the cover (the −Y-axis direction) when the first fastening pipe **823** is inserted into the first detergent discharge port **814**.
[0137] The first withdrawal prevention portion **851** may be formed as a bar that may reciprocate along a height direction of the first detergent box **81***a* (the Z-axis direction). When the first detergent box **81***a* is seated in the first mounting space **821**, a free end of the first withdrawal prevention portion **851** may be withdrawn from the first detergent box **81***a* to be in contact with an edge of the first mounting space **821**. The first withdrawal prevention portion **851** may move into the first detergent box **81***a* by a first lever **853** disposed on the first storage body **811**.
[0138] As shown in FIG. **9**, the second withdrawal prevention portion **854** may be formed to restrict the second detergent box **81***b* from moving along the width direction of the cover (the +Y-axis direction) when the second fastening pipe **824** is inserted into the second detergent discharge port **818**.
[0139] The second withdrawal prevention portion **854** may be formed as a bar that may reciprocate along a height direction of the second detergent box **81***b* (the Z-axis direction). When the second detergent box **81***b* is seated in the second mounting space **822**, a free end of the second withdrawal prevention portion **854** may be withdrawn from the second detergent box **81***b* to be in contact with an edge of the second mounting space **822**. The second withdrawal prevention portion **854** may move into the second detergent box **81***b* by a second lever **856** disposed on the second detergent box **81***b*.
[0140] The fixing portion **85** may further include a first body fixing portion **852** disposed in the first detergent box **81***a* and a second body fixing portion **855** disposed in the second detergent box **81***b*.

[0141] The first body fixing portion **852** may be formed as a protrusion protruding from the edge of the first detergent box **81***a* toward the first detergent discharge port **814**, and the second body fixing portion **855** may be formed as a protrusion protruding from the edge of the second detergent box **81***b* toward the second detergent discharge port **818**.
[0142] In this case, the mounting body **82***a* preferably has a first fixing groove **825** into which the first body fixing portion **852** is inserted, and a second fixing groove **826** into which the second body fixing portion **855** is inserted. When the first detergent box **81***a* is coupled to the first mounting space **821**, the first body fixing portion **852** will be inserted into the first fixing groove **825** and the second body fixing portion **855** will be inserted into the second fixing groove **826**.
[0143] The first body fixing portion **852** and the first fixing groove **825** restrict the first detergent box **81***a* from moving in the depth direction (the X-axis direction) and the height direction (the Z-axis direction) of the cover **12**, and the direction in which the hub **82***b* is located (the +Y-axis direction). The second body fixing portion **855** and the second fixing groove **826** may restrict the second detergent box **81***b* from moving in the depth direction (the X-axis direction) and the height direction (the Z-axis direction) of the cover **12**, and the direction in which the hub **82***b* is located (the −Y axis direction).
[0144] The first detergent box **81***a* and the second detergent box **81***b* are fixed to the mounting portion **82** such that at least two of multiple surfaces constituting the first storage body **811** are exposed to the outside of the first mounting space **821** and at least two of multiple surfaces constituting the second storage body **815** are exposed to the outside of the second mounting space **822**. However, the first detergent box **81***a* and the second detergent box **81***b* may be stably fixed to the cabinet **1** via the fastening pipes **823** and **824**, the detergent discharge ports **814** and **818**, and the fixing portion **85** described above.
[0145] One surface of the first storage body **811** (a surface facing the direction in which the laundry inlet is located or the like) exposed to the outside of the first mounting space **821** may be entirely or partially made of a transparent material. This is to allow the user to check a remaining amount of detergent without separating the first detergent box from the mounting portion **82**. For the same reason, one surface of the second storage body **815** (a surface facing the direction in which the laundry inlet is located or the like) exposed to the outside of the second mounting space **822** may be entirely or partially made of the transparent material.
[0146] The first detergent inlet **812** may be defined in the surface of the first storage body **811** located outside the first mounting space **821**, and the second detergent inlet **816** may be defined in the surface of the second storage body **815** located outside the second mounting space **822**. This is to enable the detergent to be injected into each detergent box without separating the first detergent box and the second detergent box from the mounting portion **82**. FIG. **4** shows a case in which the first detergent inlet **812** is defined in the top surface of the first storage body **811** and the second detergent inlet **816** is defined in the top surface of the second storage body **815** as an example.
[0147] Because the structure and the control method of the laundry treating apparatus described above describe an example of the present disclosure, the scope of rights of the present disclosure is not able to be limited to the structure and the control method described above.

Claims

1-**16**. (canceled)
17. A laundry treating apparatus comprising: a cabinet having a cover defining a top surface of the cabinet, the cover having a laundry inlet extending therethrough; a tub located inside the cabinet, the tub being configured to store water therein; a drum rotatably located inside the tub, the drum being configured to store laundry therein; a mounting portion including: a hub fixed to the second space; a first mounting groove; and a second mounting groove facing the first mounting groove along a width direction of the cover with the hub interposed therebetween; a first detergent box

configured to store a detergent therein, the first detergent box being slidable toward the hub from an edge of the first mounting groove along the width direction of the cover; and a second detergent box configured to store the detergent therein, the second detergent box being slidable toward the hub from an edge of the second mounting groove along the width direction of the cover.

18. The laundry treating apparatus of claim 17, wherein the mounting further portion includes: a first fastening pipe protruding from the hub along the width direction of the cover, the first fastening pipe being configured to place the tub in communication with the first detergent box; and a second fastening pipe protruding from the hub along the width direction of the cover, the second fastening pipe being configured to place the tub in communication with the second detergent box.

19. The laundry treating apparatus of claim 18, wherein the first detergent box includes: a first storage body configured to store the detergent; and a first detergent discharge port configured to receive the first fastening pipe when the first storage body is inserted into the first mounting groove along the width direction of the cover, and wherein the second detergent box includes: a second storage body configured to store the detergent; and a second detergent discharge port configured to receive the second fastening pipe therein when the second storage body is inserted into the second mounting groove along the width direction of the cover.

20. The laundry treating apparatus of claim 19, wherein the first storage body is restricted from moving in a height direction of the cover and a front and rear direction of the cover when the first fastening pipe is inserted into the first detergent discharge port, and wherein the second storage body is restricted from moving in the height direction of the cover and the front and rear direction of the cover when the second fastening pipe is inserted into the second detergent discharge port.

21. The laundry treating apparatus of claim 20, further comprising: a first withdrawal prevention portion configured to prevent the first fastening pipe from being withdrawn from the first detergent discharge port when the first fastening pipe is received in the first detergent discharge port; and a second withdrawal prevention portion configured to prevent the second fastening pipe from being withdrawn from the second detergent discharge port when the second fastening pipe is received in the second detergent discharge port.

22. The laundry treating apparatus of claim 21, wherein the first withdrawal prevention portion is configured to restrict the first storage body from moving in a direction away from the hub along the width direction of the cover, and wherein the second withdrawal prevention portion is configured to restrict the second storage body from moving in a direction away from the hub along the width direction of the cover.

23. The laundry treating apparatus of claim 19, wherein at least two surfaces of the first storage body are exposed outside of the first mounting groove, and wherein at least two surfaces of the second storage body are exposed outside of the second mounting groove.

24. The laundry treating apparatus of claim 23, wherein at least one of the two surfaces of the first storage body exposed outside of the first mounting groove is a least partially made of a transparent material.

25. The laundry treating apparatus of claim 24, wherein at least one of the two surfaces of the second storage body exposed outside of the second mounting groove is at least partially made of a transparent material.

26. The laundry treating apparatus of claim 19, wherein the first storage body includes a first detergent inlet located in a surface outside of the first mounting groove, and wherein the second storage body includes a second detergent inlet located in a surface outside of the second mounting groove.

27. The laundry treating apparatus of claim 19, wherein the first storage body includes: a first detergent inlet in a top surface of the first storage body parallel to the cover; and the first detergent discharge port located on a surface of the first storage body opposite the top surface, the first detergent discharge port facing the hub, and wherein the second storage bodying includes: a second detergent inlet in a top surface of the second storage body parallel to the cover; and the second

detergent discharge port located on a surface of the second storage body opposite the top surface, the second discharge port facing the hub.

28. The laundry treating apparatus of claim 19, further comprising a transferrer configured to transfer the detergent introduced into the first fastening pipe and the second fastening pipe to the tub.

29. The laundry treating apparatus of claim 19, further comprising: a tub inlet in the tub, the tub inlet being located under the laundry inlet; a water supply passage including: a passage body fixed to the cabinet; and a chamber located inside the passage body and configured to guide water supplied from a water supply source to the tub inlet; and a transferrer configured to guide the detergent introduced into the first fastening pipe and the second fastening pipe to the chamber.

30. The laundry treating apparatus of claim 29, further comprising a drawer extendable from the chamber, the drawer including a detergent passage configured to guide the detergent introduced into the first fastening pipe and the second fastening pipe into the chamber.

31. The laundry treating apparatus of claim 30, wherein the passage body includes a connection chamber protruding from one surface of the passage body in an insertion direction of the drawer or in a direction perpendicular to the insertion direction of the drawer, the connection chamber being in communication with the chamber, and wherein the transferrer includes: a first transferrer configured to move the detergent introduced into the first fastening pipe to the connection chamber; and a second transferrer configured to move the detergent introduced into the second fastening pipe to the connection chamber.

32. The laundry treating apparatus of claim 31, further comprising a distributer located inside the chamber and above the drawer, the distributer being configured to guide some of the water introduced into the chamber to the detergent passage and to guide a remainder of the water introduced into the chamber to the connection chamber.

33. The laundry treating apparatus of claim 19, wherein the first detergent box further includes a first check valve at a distal end of the first detergent discharge port, and wherein the second detergent box includes a second check valve at a distal end of the second detergent discharge port.

34. The laundry treating apparatus of claim 17, wherein at least two surfaces of the first detergent box are exposed outside of the first mounting groove, and wherein at least two surfaces of the second detergent box are exposed outside of the second mounting groove.

35. The laundry treating apparatus of claim 34, wherein at least one of the two surfaces of the first detergent box exposed outside of the first mounting groove is a least partially made of a transparent material.

36. The laundry treating apparatus of claim 35, wherein at least one of the two surfaces of the second detergent box exposed outside of the second mounting groove is at least partially made of a transparent material.