

# US Patent & Trademark Office

## Patent Public Search | Text View

United States Patent Application Publication

20250257515

Kind Code

A1

Publication Date

August 14, 2025

Inventor(s)

KIM; Younghun et al.

### LAUNDRY TREATING APPARATUS

#### Abstract

A laundry treating apparatus includes a mounting part provided on the top cover to deliver a laundry agent to the tub and a first storage part detachably disposed in the mounting part to store the laundry agent. The mounting part may include a mounting groove allowing the first storage part to be seated therein, a communication passage provided in the mounting groove to communicate with the first storage part, and a drain hole provided in the mounting groove to communicate with the tub. The laundry agent stored in the first storage part may be delivered to the tub through the mounting part. A fluid present in the mounting groove may be discharged to the tub through the drain hole.

**Inventors:** KIM; Younghun (Seoul, KR), JUNG; Sungwoon (Seoul, KR), KIM; Kunwoo (Seoul, KR)

**Applicant:** LG ELECTRONICS INC. (Seoul, KR)

**Family ID:** 1000008591402

**Assignee:** LG ELECTRONICS INC. (Seoul, KR)

**Appl. No.:** 18/708145

**Filed (or PCT Filed):** December 13, 2022

**PCT No.:** PCT/KR2022/020177

#### Foreign Application Priority Data

KR 10-2022-0150882

Nov. 11, 2022

#### Publication Classification

**Int. Cl.:** D06F39/02 (20060101); D06F37/12 (20060101); D06F39/08 (20060101)

## Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS [0001] This application is the National Phase of PCT International Application No. PCT/KR2022/020177, filed on Dec. 13, 2022, which claims priority under 35 U.S.C. 119 (a) to Patent Application No. 10-2022-0150882, 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 ART

[0003] Generally, a laundry treating apparatus (clothing processing apparatus) is a household appliance for removing dirt from clothing by using water and detergent, and includes a tub arranged to store water, a water supply configured to supply water to the tub, and a detergent supply disposed in a flow path connecting the water supply and the tub to supply detergent to the tub together with the water. When the drum is rotated by the motor with wash water supplied to the laundry that is accommodated in the drum, dirt can be removed from the laundry by friction between the laundry and the drum and wash water.

[0004] The laundry treating apparatus is capable of performing operations such as washing, rinsing, dehydrating, and drying. Laundry treating apparatuses may be divided into a top-loading type and a front-loading type based on the method of loading the laundry into the drum.

[0005] The detergent supply device is provided with a laundry agent supply function for supplying a detergent or laundry agent (hereinafter referred to as “laundry agent”) to enhance the washing effect.

[0006] Here, the laundry agent refers to a substance that enhances a washing effect, such as a fabric detergent, a fabric softener, and a fabric bleach. The laundry agent may include a powdered laundry agent or a liquid laundry agent.

[0007] Korean Patent No. 10-2205280 B1 discloses a top-loading type laundry treating apparatus including a detergent supply device.

[0008] The laundry treating apparatus applies a drawer-type automatic detergent supply device to a top-loading type washing machine having an opening at the top of a cabinet through which clothing is loaded, and a door for opening and closing the opening.

[0009] The cartridge of the automatic detergent supply device is of the drawer type, which is slidably inserted and withdrawably mounted in a dispenser housing including a water supply passage in communication with the tub.

[0010] The laundry detergent, by its very nature, deposits and solidifies over time, requiring cleaning in and around the cartridge. In addition, when inserting and withdrawing the cartridge, leaked laundry detergent or residual water from the connection port connected to the dispenser housing may remain in the cartridge.

[0011] However, when the cartridge is embedded in the laundry treating apparatus as a drawer type, as in the prior art, there is no need to remove residual water or residual detergent because the area where the connection port is positioned is not exposed to the outside of the washing machine.

[0012] However, in the case of an externally exposed type cartridge that is exposed to the outside of the laundry treating apparatus, the detergent or residual water remaining in the cartridge may be seen to the user, which may cause aesthetic degradation or hygiene issues.

[0013] Therefore, there is a need to minimize the residual detergent leaking from the connection port when the cartridge is removed.

## DISCLOSURE

### Technical Problem

[0014] An object of the present disclosure devised to solve the above-described problems is to provide a laundry treating apparatus capable of removing residual detergent from a seating part where a cartridge or a storage part storing detergent is seated in an automatic detergent supply device of a top-loading type washing machine.

[0015] Another object of the present disclosure is to provide a laundry treating apparatus capable of removing residual water present in the seating part in an automatic detergent supply device of a top-loading type washing machine.

[0016] Another object of the present disclosure is to provide a laundry treating apparatus capable of discharging detergent or residual water remaining in the seating part in an automatic detergent supply device of a top-loading type washing machine to a tub.

[0017] Another object of the present disclosure is to provide a laundry treating apparatus capable of minimizing the amount of detergent or residual water that remains in the seating part of an automatic detergent supply device of a top-loading type washing machine to improve the hygiene of the seating part.

### Technical Solution

[0018] The object of the present disclosure can be achieved by providing a laundry treating apparatus (clothing processing apparatus) including a cabinet including a top cover provided with an inlet, a tub disposed inside the cabinet to store water, a drum rotatably disposed in the tub to accommodate laundry (clothing), a mounting part provided on the top cover to deliver a laundry agent to the tub, a first cartridge (or a first storage part) detachably disposed in the mounting part to store the laundry agent, wherein the mounting part may include a mounting groove allowing the first cartridge to be seated therein, a communication passage provided in the mounting groove to communicate with the first cartridge, and a drain hole provided in the mounting groove to communicate with the tub, wherein the laundry agent stored in the first cartridge may be delivered to the tub through the mounting part, wherein a fluid present in the mounting groove may be discharged to the tub through the drain hole.

[0019] In one embodiment, the mounting groove may be inclined downwardly towards the drain hole.

[0020] In one embodiment, the mounting part may further include a drain groove formed by recessing a portion of the mounting groove, wherein the drain hole may be formed in the drain groove.

[0021] In one embodiment, the first cartridge may be detachably arranged in the mounting part in a width direction of the cabinet.

[0022] In one embodiment, the mounting groove may include a restriction surface provided on an inner side or one end of the mounting groove to support the first cartridge, wherein the communication passage may be provided on the restriction surface, wherein the drain hole may be provided in a bottom surface of the mounting groove.

[0023] In one embodiment, the first cartridge may include a connector extending from the drain hole to allow the fluid to flow therethrough.

[0024] In one embodiment, the laundry treating apparatus may further include a second cartridge (or a second storage part) provided in the top cover to store the laundry agent in communication with the tub, wherein one end of the connector may be connected to the drain hole, and an opposite end of the connector may be connected to the second cartridge to discharge the fluid into the tub.

[0025] In one embodiment, the connector may be provided with a hose to allow the fluid to flow into the tub.

[0026] In one embodiment, the second cartridge may include a wash hole provided at a position

corresponding to the drain hole, wherein the opposite end of the connector may be connected to the wash hole.

[0027] In one embodiment, the laundry treating apparatus may further include a gasket arranged at the opposite end of the connector along an outer circumferential surface of the connector.

[0028] In one embodiment, one end of the connector may be connected to the drain hole, and an opposite end of the connector may be provided in an open top of the tub.

[0029] In one embodiment, the laundry treating apparatus may further include a nozzle part disposed facing the tub, wherein an opposite end of the connector may be connected to the nozzle part.

[0030] In one embodiment, the laundry treating apparatus may further include a water supply provided in the cabinet to supply water to the tub, wherein the nozzle part may include a spray nozzle connected to the water supply and disposed facing the tub.

[0031] In one embodiment, the nozzle part may include a drainage nozzle connected to the opposite end of the connector and disposed facing the tub, wherein the spray nozzle and the drainage nozzle may be spaced apart from each other.

[0032] In one embodiment, the first cartridge may be detachably mounted on the mounting part in a height direction of the cabinet, wherein a bottom surface of the mounting groove may be provided with the communication passage and the drain hole.

#### Advantageous Effects

[0033] According to embodiments of the present disclosure, residual detergent may be removed from a seating part where a cartridge or a storage part storing detergent is seated in an automatic detergent supply device of a top-loading type washing machine.

[0034] According to embodiments of the present disclosure, residual water present in the seating part in an automatic detergent supply device of a top-loading type washing machine may be removed.

[0035] According to embodiments of the present disclosure, detergent or residual water remaining in the seating part in an automatic detergent supply device of a top-loading type washing machine may be discharged to a tub.

[0036] According to embodiments of the present disclosure, the amount of detergent or residual water that remains in the seating part of an automatic detergent supply device of a top-loading type washing machine may be minimized, thereby improving the hygiene of the seating part.

---

## Description

### DESCRIPTION OF DRAWINGS

[0037] FIG. 1 illustrates a configuration of a laundry treating apparatus according to the present disclosure.

[0038] FIG. 2 shows an exterior of the laundry treating apparatus according to the present disclosure.

[0039] FIG. 3 shows a structure of the top cover of the laundry treating apparatus according to the present disclosure.

[0040] FIG. 4 is a rear perspective view showing an automatic detergent supply device according to the present disclosure.

[0041] FIG. 5 illustrates an embodiment of attachment and detachment of a storage part to and from a mounting part according to the present disclosure.

[0042] FIG. 6 illustrates another embodiment of attachment and detachment of the storage part to and from the mounting part according to the present disclosure.

[0043] FIG. 7 is a perspective view showing the mounting part.

[0044] FIG. 8 is a top view showing the mounting part.

[0045] FIG. **9** is a cross-sectional view showing the mounting part.

[0046] FIG. **10** shows a detailed structure of the storage part according to an embodiment.

[0047] FIG. **11** shows the structure of a manual detergent supply device of the laundry treating apparatus according to the present disclosure.

[0048] FIG. **12** shows a connector according to an embodiment of the present disclosure.

[0049] FIG. **13** shows a detailed structure of the connector according to the embodiment of the present disclosure.

[0050] FIG. **14** shows a connector according to another embodiment of the present disclosure.

[0051] FIG. **15** shows a detailed structure of the connector according to the embodiment of the present disclosure.

[0052] FIG. **16** shows a connector according to one embodiment of the present disclosure.

[0053] FIG. **17** shows a detailed structure of the connector according to the embodiment of the present disclosure.

[0054] FIG. **18** shows a sprayer and a connector according to one embodiment of the present disclosure.

[0055] FIG. **19** is a cross-sectional view showing the sprayer.

[0056] FIG. **20** is an enlarged view showing the sprayer.

[0057] FIG. **21** is an enlarged view showing the sprayer.

#### BEST MODE

[0058] Hereinafter, exemplary embodiments will be described in detail with reference to the accompanying drawings. In the present specification, the same or similar reference numerals are assigned to the same or similar elements in different embodiments, and each of them will be described only once. As used herein, the singular forms “a”, “an” and “the” include plural forms unless the context clearly indicates otherwise. In addition, in describing the embodiments disclosed herein, the detailed description of the related known technology may be omitted to avoid obscuring the subject matter of the embodiments. It should be noted that the accompanying drawings are merely provided to facilitate understanding of the embodiments disclosed in the present specification and are not to be construed as limiting the technical spirit disclosed in the present specification.

[0059] FIG. **1** illustrates a configuration of a laundry treating apparatus according to the present disclosure.

[0060] The laundry treating apparatus **1** of the present disclosure may be configured to perform any washing course to remove foreign matter from the clothing with water and detergent.

[0061] The laundry treating apparatus of the present disclosure may include a cabinet **10** defining an exterior, a tub **50** disposed inside the cabinet **10** to store water, a drum **60** rotatably disposed in the tub **50** to accommodate laundry (or clothing), and a drive part **90** coupled to the tub **50** and configured to rotate the drum **60**.

[0062] The cabinet **10** may have an opening **21** at the top into which the clothing is loaded, and the tub **50** and the drum **60** may also each have an inlet at the top into which the clothing is loaded.

[0063] Further, the drive part **90** may be fixed to a bottom surface of the tub **50** to rotate the drum **60**.

[0064] The laundry treating apparatus of the present disclosure may further include a suspension arranged inside the cabinet **10** to support the tub **50**. The suspension may include a damper and a spring connecting the lower portion of the tub **50** to an inner upper portion of the cabinet **10**.

[0065] The laundry treating apparatus of the present disclosure may include a water supply **70** arranged at the rear of the cabinet **10** to communicate with an external water source to supply water to the tub **50**, and a drainage part **80** arranged to communicate with the lower portion of the tub **50** to drain water accommodated in the tub **50** to the outside of the cabinet **10**.

[0066] The laundry treating apparatus of the present disclosure may include one or more of a manual detergent supply device **100** and an automatic detergent supply device **1000** configured to

supply detergent to the tub **50**.

[0067] The manual supply device **100** may allow a user to manually add detergent.

[0068] The manual supply device **100** may be arranged to communicate with the water supply **70** and the tub **50** to receive water supplied from the water supply **70**, such that all of the detergent added is delivered to the tub **50**. As a result, the manual supply device **100** is arranged to be supplied with an appropriate amount of detergent directly from the user each time the course is performed.

[0069] The automatic detergent supply device **1000** may be arranged to store a large amount of detergent to be supplied to the tub **50**. In other words, the automatic detergent supply device **1000** may be arranged to store as much detergent as to perform the course multiple times such that an appropriate amount of detergent is discharged into the tub **50** each time the course is performed.

[0070] Unlike the manual detergent supply device **100**, the automatic detergent supply device **1000** may be configured not to be supplied with water from the water supply **70**. In other words, since the automatic detergent supply device **1000** is not supplied with water from the water supply **70**, the water supplied to the water supply **70** may be prevented from fully discharging the detergent even when a large amount of detergent is stored.

[0071] The automatic detergent supply device **1000** may have a downstream portion connected to the water supply **70** or the tub **50**, but an upstream portion thereof may communicate with the water supply **70**.

[0072] The laundry treating apparatus of the present disclosure may include both the manual detergent supply device **100** and the automatic detergent supply device **1000**, or may include only one of the devices.

[0073] When both the manual detergent supply device **100** and the automatic detergent supply device **1000** are provided, the manual detergent supply device **100** and the automatic detergent supply device **1000** may be arranged such that the downstream portions thereof communicate with each other. Thereby, the flow path structure may be simplified.

[0074] FIG. **2** shows an exterior of the laundry treating apparatus according to the present disclosure.

[0075] The laundry treating apparatus **1** of the present disclosure may include a top cover **20** coupled to an upper portion of the cabinet **10**. The top cover **20** may define a top surface of the laundry treating apparatus **1** and may be provided with an opening **21** through which clothing is loaded.

[0076] The top cover **20** may be provided with a control panel **40** having an input part configured to receive a command to perform the course, and a display configured to externally display the status of the course being performed, the status of the automatic detergent supply device **1000**, and the like.

[0077] The top cover **20** may be formed of a different material than the cabinet **10**.

[0078] Thus, even when the cabinet **10** is formed of metal to ensure durability, the top cover **20** may be formed of resin or the like to provide a complex structure or to facilitate coupling of other components.

[0079] For example, a door **30** to open and close the opening **21** may be rotatably coupled to the top cover **20**.

[0080] The automatic detergent supply device **1000** may store a larger amount of detergent as its volume increases, thereby reducing the number of times a user needs to refill the detergent.

[0081] Further, the automatic detergent supply device **1000** may be detachably attached to the laundry treating apparatus **1** of the present disclosure. Thus, the automatic detergent supply device **1000** may be easily cleaned by the user. Furthermore, the user may easily replace any unwanted detergent or foreign matter introduced.

[0082] Also, the suspension is not arranged at the corners of the cabinet **10**, and the tub **50** is arranged adjacent to the cabinet **10** up to the inner upper end of the cabinet **10**. Accordingly, there

is insufficient space inside the cabinet **10** for the automatic detergent supply device **1000** to be installed in.

[0083] Therefore, the automatic detergent supply device **1000** may be disposed outside the cabinet **10**, and may expand to have a sufficient volume without being constrained by the space in the cabinet **10**.

[0084] The automatic detergent supply device **1000** may be coupled to the top cover **20** to be exposed to the outside. As a result, the automatic detergent supply device **1000** may be easily removed from and mounted to the top cover **20**.

[0085] When the automatic detergent supply device **1000** is disposed in front of or on either side of the door **30** or the opening **21**, the automatic detergent supply device **1000** may interfere with opening the door **30** and/or loading clothing into the opening **21**.

[0086] Accordingly, the automatic detergent supply device **1000** may be disposed at the rear of the door **30** or the opening **21**. Thereby, a user may open the door **30** or load the clothing into the opening **21** without being interfered with by the automatic detergent supply device **1000**.

Furthermore, the automatic detergent supply device **1000** may support the opened door **30**, thereby preventing the door **30** from being excessively opened in the opening **21**.

[0087] The drive part **90** is disposed under the tub **50**. Accordingly, when the laundry treating apparatus of the present disclosure vibrates, the top cover **20** may vibrate the most. Since the automatic detergent supply device **1000** is capable of accommodating a large amount of detergent, it weighs a lot and is therefore subjected to a large inertia force. In such a situation, when the automatic detergent supply device **1000** is detachably coupled to the upper portion of the top cover **20**, the automatic detergent supply device **1000** of the laundry treating apparatus is subjected to the highest amplitude vibration. Thus, the automatic detergent supply device **1000** is likely to be unintentionally detached from the top cover **20**.

[0088] Therefore, the automatic detergent supply device **1000** may be fully accommodated in a housing provided in the top cover and may have a drawer type form that is withdrawable outwardly from one side of the housing.

[0089] However, when the automatic detergent supply device **1000** is provided as a drawer type while being coupled to the rear of the door **30** of the top cover **20**, the direction in which the automatic detergent supply device **1000** is withdrawn from the housing may correspond to any one of the top, side, or front.

[0090] Since the top-loading type washing machine is formed to have a height greater than a width thereof in order to secure a washing capacity, it is very difficult for a user to withdraw and insert the automatic detergent supply device **1000** from and into the housing of the top cover **20** in a vertical direction. Furthermore, since the automatic detergent supply device is disposed at the rear of the door **30**, it may be very difficult for the user to withdraw and insert the automatic detergent supply device **1000** from and into the housing of the top cover **20** in the vertical direction.

[0091] Further, it may be easier for the user to withdraw and insert the automatic detergent supply device when the automatic detergent supply device is arranged to be laterally withdrawn from and inserted into the housing of the top cover **20** than when it is arranged to be withdrawn and inserted in the vertical direction.

[0092] However, in order for the entire automatic detergent supply device to be withdrawn from the housing, space allowing the automatic detergent supply device to be withdrawn laterally as far as the length of the automatic detergent supply device is needed. Accordingly, if the space in which the laundry treating apparatus is arranged is narrow and thus the distance by which the automatic detergent supply device can be withdrawn is not secured, the user cannot use the automatic detergent supply device.

[0093] When the automatic detergent supply device is arranged to be withdrawn from and inserted into the top cover **20** in a front-back direction, the distance by which the automatic detergent supply device is withdrawn may always be secured.

[0094] However, in order for the automatic detergent supply device to be coupled to the housing to communicate with the tub, a pump or hose to be coupled to the automatic detergent supply device to communicate with the automatic detergent supply device needs to be provided on the back side of the housing facing the side into which the automatic detergent supply device is inserted.

[0095] Therefore, additional space where the pump and/or hose is to be installed should be provided on the back side of the door **30** and the inlet because the automatic detergent supply device should be disposed ahead of the pump or hose. As a result, a sufficient volume of the automatic detergent supply device may not be secured. If the length in the insertion/withdrawal direction is extended sufficiently to secure the volume of the automatic detergent supply device, the area of the opening **21** may be reduced. As a result, it may become difficult to insert and withdraw clothing, or the opening **21** and the door **30** may be disposed with an excessive forward bias with respect to the top cover **20**, causing an imbalance due to preferential loading of clothing only in the front of the drum **60**.

[0096] As a result, for a top-loading type washing machine such as the laundry treating apparatus of the present disclosure, it is not preferable to configure the automatic detergent supply device **1000** as a drawer type.

[0097] Therefore, the automatic detergent supply device **1000** of the laundry treating apparatus of the present disclosure may be configured to be mounted on the top of the top cover **20**, such that it is exposed to the outside.

[0098] As a result, in the laundry treating apparatus of the present disclosure a direction in which the automatic detergent supply device **1000** is mounted to or detached from the top cover **20** is less restricted than in the case of the drawer type, while securing a degree of freedom. Further, it is allowed to extend at least one of a sufficient height, width, or length of the automatic detergent supply device.

[0099] FIG. **3** shows a structure of the top cover of the laundry treating apparatus according to the present disclosure.

[0100] The automatic detergent supply device **1000** of the laundry treating apparatus of the present disclosure may be disposed on the top cover **20**.

[0101] The top cover **20** may be formed of a plastic material and may be readily molded into a structure on which the automatic detergent supply device **1000** may be seated.

[0102] The water supply **70** may be installed on the rear surface of the top cover **20**. The manual supply device **100** may be disposed at a rear lower portion of the opening **21** formed through the top cover **20**.

[0103] The manual supply device **100** may be forwardly withdrawable from the top cover **20** to receive a powdered detergent or liquid detergent. The manual supply device **100** may be configured to communicate with the water supply **70** to receive water and discharge the loaded detergent downward.

[0104] Since the inlet of the tub **50** is disposed below the opening **21**, the detergent discharged from the manual supply device **100** may be delivered directly into the tub **50**.

[0105] The manual supply device **100** may include a drawer **130** that is withdrawable forwardly from the opening **21**. Thus, the drawer may be withdrawn forward only when detergent is being loaded, and at other times may remain accommodated in the top cover **20** so as not to interfere with the clothing being loaded.

[0106] The automatic detergent supply device **1000** may be disposed on the rear upper portion of the top cover **20**. The automatic detergent supply device **1000** may be disposed above the water supply **70**, and may be disposed above the manual detergent supply device **100**.

[0107] Thus, the detergent discharged from the automatic detergent supply device **1000** may be delivered to the water supply **70** or the manual detergent supply device **100** so as to be supplied to the tub **50**.

[0108] The automatic detergent supply device **1000** may include a storage part **200** (a cartridge)



configured to store the detergent supplied to the tub **50**, and a mounting part **300** configured to secure the storage part **200** to an upper portion of the top cover **20**.

[0109] The storage part **200** may be detachably attached to the mounting part **300**. Thus, the storage part **200** may be detached from the mounting part **300** when necessary, which may facilitate cleaning/maintenance.

[0110] Further, the storage part **200** may be detached from the mounting part **300** for a user to supply detergent to the storage part **200**. This may allow the user to supply the detergent to the storage part **200** without being restricted to a location, and prevent contamination of the top cover **20** or the like during the process of supplying the detergent to the storage part **200**.

[0111] A plurality of storage parts **200** may be provided to store different detergents. The plurality of the storage parts **200** may be mounted on the mounting part **300** along the width direction of the top cover **20**.

[0112] The mounting part **300** may be disposed on a rear portion of the top cover **20** in the width direction of the top cover **20**. The mounting part **300**, which may be integrated with the top cover **20**, may be mounted on the top cover **20** at the rear of the door **30**.

[0113] The mounting part **300** may be configured to allow the storage part **200** to be mounted thereon, and the storage part **200** may be configured such that the lower portion thereof is secured to the mounting part **300**.

[0114] The storage part **200** may be coupled to and detached from the mounting part **300** while exposed to the outside of the top cover **20**. Thus, the direction in which the storage part **200** is coupled to or detached from the mounting part **300** is not fixed to a particular direction, and may thus allow the user to couple and detach the storage part **200** to and from the mounting part **300** without being significantly interfered with by the height of the cabinet **10**.

[0115] The overall length of the storage part **200** may be greater than the height or thickness of the storage part **200**. Thus, the center of gravity of the storage part **200** may be lowered and the area of the door **30** or the opening **21** may be ensured, while increasing the detergent storage capacity of the storage part **200**.

[0116] The mounting part **300** may be provided with a conveying part to receive the detergent from the storage part **200** and discharge the same to the tub **50**. The conveying part may include a detergent pump configured to discharge the detergent from the storage part **200**, and a detergent supply pipe allowing the detergent pump to communicate with at least one of the water supply **70**, the tub **50**, or the manual detergent supply device **100** therethrough.

[0117] FIG. **4** is a rear perspective view showing an automatic detergent supply device according to the present disclosure.

[0118] With reference to FIG. **4**, the storage part **200** and mounting part **300** disposed on the rear portion of the top cover **20** will be described.

[0119] The storage part **200** may include a first storage part **200a** (a first cartridge) detachably coupled to the mounting part **300** to store a first detergent, and a second storage part **200b** (a second cartridge) provided separately from the first storage part **200a** and detachably coupled to the mounting part **300** to store a second detergent.

[0120] The first detergent may be a laundry detergent necessary to remove foreign matter from the clothing, and the second detergent may be a bleaching agent to bleach the clothing or a softener to control the stiffness and fragrance of the fibers.

[0121] The first detergent and the second detergent may be provided in liquid form and may be easily discharged into the mounting part **300** by their own weights.

[0122] The manual detergent supply device **100** may be configured to store a third detergent. The third detergent may be a separate detergent different from the first and second detergents, or may be the same as the first and second detergents but in powdered form.

[0123] Of course, the third detergent may be completely identical to one of the first and second detergents.

[0124] The first storage part **200a** and the second storage part **200b** may have the same shape and be arranged symmetrical to each other with respect to the surfaces thereof facing each other, or may have shapes completely different from each other.

[0125] However, the first storage part **200a** and the second storage part **200b** may have the same function in structure and may be detachably attached to the mounting part **300** in the same manner.

[0126] Therefore, the structure, coupling, and residual detergent discharge method of the storage part **200** and the mounting part **300** will be described below based on the first storage part **200a**, which is merely intended to avoid redundant description. The same description may be applied to the second storage part **200b**.

[0127] The storage part **200** may include a storage body **210** that provides a space for storing detergent, and a cover door **214** that shields an upper surface of the storage body **210** may be rotatably coupled thereto. The storage part **200** may be positioned at a top rear portion of the top cover **20** and exposed to the user.

[0128] The storage body **210** may be partially or fully formed of a transparent material. The transparent portion of the storage body **210** allows the user to view the remaining amount of the laundry detergent accommodated in the storage body **210**.

[0129] The cover door **214** covers the top of the storage body **210**. An opening is formed in the top of the storage body **210**. The cover door **214** opens and closes the opening of the storage body **210**. The laundry agent is accommodated in the storage space through the opening of the storage body **210**. A user may open the cover door **214**, fill the storage space of the storage body **210** with the laundry detergent, and close the cover door **214** to close the storage space.

[0130] According to an embodiment of the present disclosure, a push portion **260** may be formed at the rear of the storage part **200**. The push portion **260** may be formed by recessing the rear of the storage body **210**. For example, the push portion **260** may be formed by a combination of the cover door **214** and the recessed portion of the storage body **210**. The push portion **260** may include a portion of the cover door **214** exposed by the recessed portion of the storage body **210**. A user may hold the bottom surface of the exposed portion of the cover door **214** with a hand and lift the storage part **200** upward to detach the storage part **200** from the mounting part **300**. As the push portion **260** is positioned at the rear of the storage part **200**, the user may pull the storage part **200** toward the user's body while lifting the storage part **200** upward, and the storage part **200** may be reliably detached. As an example, when the storage part **200** is detached, the storage part **200** may be prevented from falling rearward of the laundry treating apparatus **1**.

[0131] FIG. 5 illustrates an embodiment of attachment and detachment of a storage part to and from a mounting part according to the present disclosure.

[0132] The storage part **200** may be attached to and detached from the mounting part **300** in the height direction of the cabinet **10**. In other words, the storage part **200** may be coupled to the mounting part **300** in a vertically pluggable manner.

[0133] The first storage part **200a** and the second storage part **200b** are detachable. As the storage part **200** is detachable from the mounting part **300**, a user may conveniently refill the storage part **200** with laundry detergent. In addition, the storage part **200** may be conveniently cleaned.

[0134] The cover door **214** may be hingedly coupled to the storage body **210**. A hinge coupling portion **2116** may be pivotably provided at a rear top of the body **210**. The hinge coupling portion **2116** may be provided at the push portion **260**.

[0135] The push portion **260** may be formed in a shape inwardly recessed in the storage body **210**. The hinge coupling portion **2116** may be provided on the sidewall formed by the recess. The cover door **214** may pivotally rotate around the hinge coupling portion **2116**.

[0136] As the hinge coupling portion **2116** is positioned at the rear of the storage body **260**, the cover door **214** pivots rearward to open. Thus, when a user detaches the storage part **200** from the mounting part **300** while holding the push portion **260**, the cover door **214** may be prevented from opening.

[0137] The mounting part **300** defines the rear top surface of the top cover **20**. The mounting part **300** is formed in a shape corresponding to the bottom surface of the storage part **200**.

[0138] FIG. **6** illustrates another embodiment of attachment and detachment of the automatic detergent supply device to and from the laundry treating apparatus of the present disclosure.

[0139] The storage body **210**, according to one embodiment, may be coupled and decoupled by sliding on the mounting part **300** along the width direction of the top cover **20**.

[0140] The storage body **210** does not need to be lifted from the mounting part **300** when detached from the mounting part **300**, and does not need to be lifted to the top of the mounting part **300** when coupled to the mounting part **300**. Thus, even though the storage body **210** is mounted on the top of the top cover **20** at the rear of the top cover **20**, the user is allowed to easily attach and detach the storage body **210** to and from the mounting part **300**.

[0141] Further, the storage body **210** may be attached to the mounting part **300** by being pushed or pulled from a side of the mounting part **300**. Thus, the storage body **210** may be slidably attached and detached to and from the mounting part **300** at the rear of the door **30**, even when the door **30** is in the open position of the opening **21**.

[0142] Once the storage body **210** is detached by moving laterally from the mounting part **300**, the storage body **210** is then allowed to freely move not only laterally on the mounting part **300**, but also upwards, forwards, backwards, and so on.

[0143] In other words, the storage body **210** may be detached from the mounting part **300** even when the inner surface of the storage body **210** does not move up to the outer side of the mounting part **300**. For example, the storage body **210** may be completely detachable from the mounting part **300** once the storage body **210** and the mounting part **300** are decoupled in terms of fluidic communication. Thus, the storage body **210** may continue to move to the side of the mounting part **300** while supported on the mounting part **300**, or it may be lifted from the mounting part **300** in all directions except the downward direction to be detached from the mounting part **300**.

[0144] As a result, the storage body **210** may be detached from the mounting part **300** even when a wall or other appliance or the like is placed on a lateral outer surface of the top cover **20** or a lateral outer surface of the mounting part **300** and thus a space allowing the storage body **210** to slide a distance corresponding to the length of the storage body **210** is not secured.

[0145] When the storage body **210** is coupled to the mounting part **300**, the operations of the method described above may be performed in reverse order.

[0146] The mounting part **300** may include a communication passage **370** that is detachably coupled to the storage body **210**. The storage body **210** may be detachably coupled to the communication passage **370** and may be configured to discharge the stored detergent into the communication passage **370**.

[0147] The communication passage **370** may be configured to protrude from the mounting part **300** in a width direction of the top cover **20**. Thereby, the storage body **210** may be moved in the width direction of the top cover **20** to be coupled to the communication passage **370**.

[0148] The mounting part **300** may allow the storage body **210** to slide on the top of the mounting part **300** until the storage body **210** is completely decoupled from the mounting part **300**.

[0149] However, the storage body **210** may slidably move on the mounting part **300** when it is coupled to the communication passage **370**. When it is released from the communication passage **370**, the storage body may be completely decoupled without slidably moving on the mounting part **300**.

[0150] As a result, the storage body **210** may slide on the top of the mounting part **300** in the width direction of the top cover **20** to be coupled to and decoupled from the mounting part **300**. However, the storage body **210** may be supported and slidable on the top of the mounting part **300** on when the storage body **210** is fluidly coupled to and decoupled from the mounting part **300**. In other words, when the storage body **210** is released from the fluidic coupling with the mounting part **300**, the storage body **210** may be allowed to freely move on the top of the mounting part **300** regardless

of the shape of the mounting part **300**.

[0151] The mounting part **300** may include a mounting groove **310** that accommodates and supports at least a portion of the lower portion of the storage body **210**.

[0152] The lower surface of the storage body **210** may be supported on both side surfaces of the mounting groove **310** and be guided to slide while accommodated in the mounting groove **310**.

[0153] One end or inner side of the mounting groove **310** may be provided with a restriction surface **320** that restricts inward movement or insertion of the storage body **210**.

[0154] The restriction surface **320** may support the storage body **210** to prevent the storage body **210** from vibrating inwardly.

[0155] The communication passage **370** may protrude outward from the restriction surface **320**. The communication passage **370** may be disposed closer to a lower portion of the restriction surface **320** than to an upper portion of the restriction surface **320**.

[0156] When the storage part **200** is decoupled from or coupled to the mounting part **300**, the laundry agent may leak through the communication passage **370** and pool in the mounting groove **310**. Accordingly, it is necessary to remove the leaked laundry agent. To this end, the mounting part **300** may include a drain **390** for draining any laundry agent or residual water present in the mounting groove **310** into the tub **50**. A detailed structure of the drain **390** will be described later.

[0157] Once the storage part **200** is secured to the mounting part **300**, it is necessary to prevent the storage part **200** from being unintentionally detached from the mounting part **300**. In other words, the ease with which the storage part **200** slides along the mounting groove **310** to be attached to and detached from the mounting part **300** means that the storage part **200** can be easily detached from the mounting part **300**.

[0158] Since the laundry treating apparatus of the present disclosure is configured as a top-loading type washing machine, more vibration is generated in the mounting part **300**. Therefore, the mounting part **300** may be configured to facilitate coupling of the storage part **200** to the mounting part **300**, but to make detachment and relative vibration of the storage part difficult.

[0159] To this end, the mounting part **300** may further include a bump **330** that prevents the storage body **210** from being withdrawn or sliding outward once the storage body **210** is coupled to the communication passage **370** or completely mounted on the mounting part **300**.

[0160] The bump **330** may protrude from the opposite end or outer side of the mounting groove **310**.

[0161] FIG. 7 is a perspective view showing the mounting part of the laundry treating apparatus of the present disclosure, and FIG. 8 is a top view showing the mounting part.

[0162] According to one embodiment, the storage body **210** may be coupled to and decoupled from the mounting part **300** by sliding in the width direction of the top cover **20**.

[0163] In this case, the mounting part **300** may include a mounting body **301** disposed widthwise of the top cover **20** on the top of the top cover **20** to support the storage part **200**, and a mounting groove **310** recessed in the mounting body **301** to accommodate and support a lower portion of the storage part **200**.

[0164] The mounting groove **310** may extend widthwise from the mounting body **301** to guide the slide movement of the storage part **200**, and may accommodate a portion of the lower portion of the storage part **200** to support or anchor the storage part **200** in a front-to-back direction.

[0165] The mounting part **300** may include a restriction surface **320** that extends upwardly stepwise from an inner side of the mounting groove **310** to prevent the storage part **200** from moving further inwardly, and may also include a communication passage **370** provided on the restriction surface **320** and detachably coupled to the storage part **200**. The communication passage **370** may be configured to be at least partially inserted into the storage body **201** to receive detergent accommodated in the storage part **200**. That is, the communication passage **370** may be arranged to communicate with the storage part **200**.

[0166] The communication passage **370** may protrude from the restriction surface **320** toward the

opposite end of the mounting groove **310** or the outside. The restriction surface **320** may support an inner surface or a portion of a lower surface of the storage body **210** to prevent the storage part **200** from vibrating toward the inner side of the restriction surface **320**.

[0167] The mounting part **300** may include accommodation ribs **340** provided on both sides with respect to the direction in which the storage part **200** slides in the mounting groove **310**, or at the front or rear with respect to the top cover **20** to support the storage part **200**.

[0168] The accommodation rib **340** may extend from one end or inner side of the mounting groove **310** toward the opposite end or outer side, and may protrude upward from the mounting body **301** to accommodate at least a portion of the lower portion of the storage part **200**.

[0169] The accommodation ribs **340** may protrude higher than the bottom surface of the mounting groove **310** and may extend outward from the upper end of the restriction surface **320**.

[0170] The mounting part **300** may include a bump **330** that protrudes outward from the outer side or opposite end of the mounting groove **310** to prevent withdrawal of the storage part **200**. The accommodation ribs **340** may extend from the restriction surface **320** to the bump **330**.

[0171] The accommodation ribs **340** may support both sides of the storage part **200** to guide the storage part **200** as it slides inwardly and outwardly of the mounting groove **310**.

[0172] The bump **330** may be arranged to face the restriction surface **320**, and may prevent the storage part **200** from vibrating outwardly beyond the bump **330**.

[0173] Accordingly, the mounting groove **310** may be defined by the accommodation ribs **340**, the bump **330**, and the restriction surface **320** protruding from the mounting body **301**, rather than being recessed in the mounting body **301**.

[0174] The mounting groove **310** may fully accommodate the lower portion of the storage part **200** to securely support the storage part **200**, or may accommodate a portion of the protruding surfaces of the lower portion of the storage part **200** to securely support the storage part **200**.

[0175] The outer surface of the bump **330** may be provided with a fastening portion **334** to detachably engage with the storage part **200**. The fastening portion **334** may be provided as a recess in the outer surface of the bump **330** to detachably engage with a hook provided on the storage part **200**.

[0176] The mounting part **300** may secure the lower portion of the storage part once the storage part is mounted in the mounting groove **310**.

[0177] Once the storage part **200** is coupled to the communication passage **370**, the restriction surface **320** and the bump **330** may secure the storage part **200** so as not to vibrate or further move in the width direction.

[0178] Once the storage part **200** is coupled to the communication passage **370**, the accommodation ribs **340** may secure the storage part **200** so as not to vibrate or further move in the front-to-back direction.

[0179] The mounting part **300** may accommodate or support four surfaces of the lower portion of the storage part **200** to prevent the storage part **200** from being unintentionally detached from the mounting part **300**.

[0180] When the storage part **200** is coupled to the communication passage **370**, the fastening portion **334** provided in the bump **330** may be detachably coupled to the storage part **200** to further secure the storage part **200**.

[0181] The mounting part **300** may further support the lower portion of the storage part **200** using a lateral step **350** disposed outside of the accommodation rib **340**, a support surface **380** disposed inside of the restriction surface **320**, and an outer step **360** disposed outside of the bump **330**.

[0182] Thus, once the storage part **200** is seated, the mounting part **300** may secure the storage part **200**, thereby preventing the storage part **200** from being unintentionally detached and preventing the storage part **200** from vibrating to any of the four sides.

[0183] The mounting groove **310** may be provided with a drain **390** in communication with the tub **50**. Thus, fluid such as detergent or water remaining in the mounting groove **310** may be

discharged to the tub **50** through the drain **390**.

[0184] The fluid may be discharged directly to the tub **50** through the drain **390**, or may be discharged via a connector **400**, which will be described later.

[0185] The communication passage **370** may be provided on the restriction surface **320**, and the drain **390** may be provided in the bottom surface of the mounting groove **310**. Thereby, the laundry agent stored in the storage part **200** may be delivered to the tub **50** through the communication passage **370**, and the fluid remaining in the mounting groove **310** may be discharged to the tub **50** through the drain **390**.

[0186] Thus, the hygiene of the laundry treating apparatus may be improved by removing any laundry agent or residual water remaining in the mounting groove **310** by discharging the same to the tub **50** through the drain **390**.

[0187] Alternatively, when the storage part **200** is attached to and detached from the mounting part **300** in a height direction of the cabinet **10**, the bottom surface of the mounting groove **310** may be provided with both the communication passage **370** and the drain **390**.

[0188] FIG. **9** is a cross-sectional view showing the mounting part.

[0189] The mounting groove **310** may be inclined downward toward the drain **390** to more easily discharge detergent remaining in the mounting groove **310** through the drain **390**.

[0190] The depth **H1** of the mounting groove **310** at a position adjacent to the communication passage **370** or the drain **390** may be greater than the depth **H2** of the mounting groove **310** at a position adjacent to the bump **330**.

[0191] Further, the mounting part **300** may be disposed such that the mounting groove **310** is inclined in the width direction of the top cover.

[0192] Thus, the fluid such as laundry agent or water remaining in the mounting groove **310** may be easily discharged through the drain hole **391** provided in the drain groove **392** by gravity.

[0193] The mounting groove **310** may be provided with a slope that decreases in height from the bump **330** to the restriction surface **320**. The mounting groove **310** may be configured to decrease in height from the opposite end or outer side to the one end or inner side such that the storage part **200** seated in the mounting groove **310** may slidably move by gravity toward the communication passage **370**.

[0194] Furthermore, when the storage part **200** is seated in the mounting groove **310**, gravity may act toward the communication passage **370**, which may facilitate delivery of the laundry agent provided in the storage part **200** to the communication passage **370** by gravity, and prevent the storage part **200** from sliding out of the mounting groove **310** in the opposite direction.

[0195] The lower portion of the storage part **200** may be disposed to have an inclination corresponding to that of the mounting groove **310** such that the center of gravity is further skewed toward the restriction surface **320**.

[0196] Thus, even when the storage part **200** is subjected to vibration in the width direction, the restriction surface **320** or the communication passage **370** may support the load of the storage part **200** while preventing the storage part **200** from moving out of the mounting groove **310**.

[0197] The mounting part **300** may further include a drain groove **392** formed by recessing a portion of the mounting groove **310**, and the drain groove **392** may have the drain hole **391** formed therein.

[0198] In the process of coupling or decoupling the communication passage **370** to or from the storage part **200**, the laundry agent may leak out. The leaked laundry agent may remain in the mounting groove **310**. The residual laundry agent may be deposited to form contaminants, and accordingly the user may need to clean the deposited contaminants. After the user cleans the deposits, any residual water remaining in the mounting groove **310** or the drain groove **392** is discharged into the tub **50** through the drain hole **391**.

[0199] According to one embodiment of the present disclosure, the residual water remaining after cleaning the residual laundry agent and its surroundings may be easily discharged through the drain

hole **391**, and the laundry agent deposited by the drain groove **392** or residual water does not spread to other components, which may facilitate cleaning and maintenance.

[0200] FIG. **10** shows a detailed structure of the storage part according to an embodiment.

[0201] The storage part **200** may include a storage body **210** configured to receive and store detergent, and a plate **220** that is provided on a lower portion of the storage body **210** and may be mounted in the mounting groove **310**.

[0202] The plate **220** defines the lower portion of the storage part **200**. The plate **220** may be integrated with the storage body **210**, or may be coupled to a lower portion of the storage body **210**.

[0203] The plate **220** may be detachably mounted to the mounting part **300**, and may be secured to the mounting part **300**. The storage body **210** may be stably secured to the mounting part **300** by the plate **220**.

[0204] The plate **220** may include a discharge portion **230** detachably coupled to the communication passage **370** at one side or the bottom thereof to discharge detergent.

[0205] The discharge portion **230** may be disposed closer to the one end or inner side than to the opposite end or outer side of the plate **220**.

[0206] Specifically, in the case where the storage part **200** is attached to and detached from the mounting part **300** in a widthwise direction of the cabinet **10**, the discharge portion **230** may be provided on the inner side of the storage body **210**. In the case where the storage part **200** is attached to and detached from the mounting part **300** in a height direction of the cabinet **10**, the discharge portion **230** may be provided on the plate **220**.

[0207] The discharge portion **230** may be provided with a check valve to discharge detergent from the storage body **210** only when coupled to the communication passage **370**.

[0208] The plate **220** may include a lower surface **222** defining the bottom surface of the storage body **210** to move the detergent to the discharge portion **230**.

[0209] The bottom surface **222** may be provided with a slope that decreases in height from the opposite end or outer side of the storage body **210** to the one end or inner side. In other words, the bottom surface **222** may be provided with a slope that decreases in height as it extends towards the discharge portion **230**, thereby guiding discharge of the detergent from the storage body **210** to the discharge portion **230** and preventing the retention of the detergent inside the storage body **210**.

[0210] Both the storage body **210** and the plate **220** may be accommodated and supported in the mounting groove **310**.

[0211] However, once the entire the storage part **200** is accommodated in the mounting groove **310**, it may be easy to support and secure the storage part in the mounting groove **310** but very difficult to withdraw the storage part.

[0212] Therefore, only a portion of the storage part **200** may be accommodated in the mounting groove **310** and the other portion thereof may be disposed on the outside of the mounting groove **310** to facilitate removal from the mounting part **300**.

[0213] To this end, the plate **220** and the storage body **210** may be configured to be longer than the width of the mounting groove **310** such that a portion thereof is disposed on the outside of the mounting groove **310**.

[0214] The plate **220** may include a coupling surface **223** extending from the bottom surface **222** to the other end or outer side. The coupling surface **223** may be disposed on the outside of the mounting groove **310**, and may be supported on an outer surface of the bump **330**.

[0215] As the discharge portion **230** is supported on the communication passage **370**, and the coupling surface **223** is supported on the bump **330**, the storage part **200** may be prevented from moving or vibrating further inwardly of the mounting groove **310**.

[0216] FIG. **11** shows the structure of a manual detergent supply device of the laundry treating apparatus according to the present disclosure.

[0217] The manual detergent supply device **100** may be configured to allow a user to manually add detergent. The manual detergent supply device **100** may be provided in the top cover **20** to

communicate with the tub **50** and store detergent.

[0218] The manual detergent supply device **100** is arranged to communicate with the water supply **70** and the tub **50**. Thus, it receives water supplied by the water supply **70** and supplies the same to the tub **50**. As a result, all of the detergent input is supplied to the tub **50**. As a result, the manual detergent supply device **100** is configured to directly receive an appropriate amount of detergent supplied by the user each time the course is performed.

[0219] The manual detergent supply device **100** may include a drawer **130** withdrawable forwardly out of the opening **21**. Thus, the manual detergent supply device is withdrawn forward only when detergent is loaded, and remains accommodated in the top cover **20** in other times so as not to interfere with the loading of the clothing.

[0220] The drawer **130** may be provided with a second body **120** into which a user may load a first detergent or a second detergent. Since the water supplied through the water supply **70** passes through the second body **120**, the detergent provided in the drawer **130** may be supplied into the tub **50** due to water pressure.

[0221] Further, the manual detergent supply device **100** may include a first body **110** configured to accommodate the second body **120** and the drawer **130** and define the exterior of the manual detergent supply device **100**.

[0222] The top surface of the first body **110** may have a water inlet hole **111** through which water supplied from the water supply **70** flows into the manual detergent supply device **100**, a residual water hole **112** into which residual water flows, and a detergent hole **113** into which detergent discharged from the automatic detergent supply device **1000** flows.

[0223] The laundry treating apparatus **1** may further include a connector **400** extending from the drain **390** through which the fluid flows in order to remove any fluid, such as laundry agent, remaining in the mounting groove **310**.

[0224] Hereinafter, embodiments of the connector **400** for discharging the fluid into the tub **50** will be described.

[0225] FIG. **12** is a cross-sectional view showing a connector according to an embodiment of the present disclosure, and FIG. **13** shows a detailed structure of the connector according to the embodiment of the present disclosure.

[0226] According to one embodiment of the present disclosure, in the laundry treating apparatus, one end of the connector **400** may be connected to the drain **390** and the opposite end of the connector **400** may be connected to the manual detergent supply device **100** to discharge the fluid into the tub **50**.

[0227] One end of the connector **400** may be formed by an extension of the drain groove **392**, or may be configured to surround an outer circumferential surface of the drain groove **392**. The connector **400** may be connected in such a way that the fluid discharged from the drain hole **391** does not leak.

[0228] According to one embodiment of the present disclosure, the connector **400** may include a hose allowing the fluid to flow into the tub **50** therethrough.

[0229] A first connector **410** according to one embodiment of the present disclosure may be connected at its opposite end to the manual detergent supply device **100**. It may include a hose. Specifically, the opposite end of the first connector **410** may be connected to the residual water hole **112** provided in the top surface of the first body **110** such that the fluid may move to the tub **50** through the manual detergent supply device **100**.

[0230] The first connector **410** is provided with an elastic hose. Accordingly, even when the drain **390** and the residual water hole **112** are not arranged to face each other, the fluid may be allowed to flow by connecting the drain **390** and the manual detergent supply device **100**, avoiding the complex structure inside the top cover **20**.

[0231] FIG. **14** is a cross-sectional view showing a connector according to one embodiment of the present disclosure, and FIG. **15** shows a detailed structure of the connector according to the



embodiment of the present disclosure.

[0232] According to one embodiment of the present disclosure, a laundry treating apparatus may be provided in which the opposite end of the connector **400** is connected to the wash hole **114**.

[0233] A second connector **420** according to one embodiment of the present disclosure may include a rigid body having one end connected to the drain **390** and an opposite end connected to the manual detergent supply device **100**. Specifically, the opposite end of the second connector **420** may be connected to the wash hole **114** provided in the top surface of the first body **110** such that the fluid may move to the tub **50** through the manual detergent supply device **100**.

[0234] In this case, the wash hole **114** of the manual detergent supply device **100** may be provided at a position corresponding to the drain **390**. The second connector **420** may include a connection tube **421** formed by the drain groove **392** extending towards the manual detergent supply device **100** and a connection space **422**, which is a space formed inside the connection tube **421**.

[0235] The connecting space **422** may have the same diameter as the drain hole **391**.

[0236] One end of the connection tube **422** may be formed by an extension of the drain groove **392**, and the opposite end of the connection tube **422** may be formed by an extension of the wash hole **114**.

[0237] The second connector **420** may further include a gasket **423** provided along an outer circumferential surface of the connector **422** at the opposite end of the connector **422**.

[0238] The gasket **423** may be arranged between the outer circumferential surface of the connector **422** and an inner circumferential surface of the wash hole **114** to secure the connector **422** to the interior of the wash hole **114**.

[0239] Since the second connector **420** is integrated with the drain **390** and the manual detergent supply device **100**, there is no risk of leakage of the fluid. Further, the second connector **420** and the manual detergent supply device **100** may be securely fixed using the gasket **423**.

[0240] FIG. **16** is a perspective view showing a connector according to one embodiment of the present disclosure, and FIG. **17** a detailed structure of the connector according to one embodiment of the present disclosure.

[0241] According to one embodiment of the present disclosure, a laundry treating apparatus including the connector **400** having an opposite end provided at the open top of the tub **50** may be provided. Thereby, the fluid may flow directly from the automatic detergent supply device **1000** to the tub **50** without passing through the manual detergent supply device **100**.

[0242] Specifically, a third connector **430** according to the embodiment of the present disclosure may have one end connected to the drain **390** and an opposite end provided at the open top of the tub **50**. The opposite end of the third connector **430** may be provided in the top cover **20**.

[0243] Furthermore, the third connector **430** includes an elastic hose. Accordingly, even when the drain **390** and the space of the top cover **20** in which the opposite end of the third connector **430** is provided are not arranged to face each other, the fluid may be allowed to flow by connecting the drain **390** and the manual detergent supply device **100**, avoiding the complex structure inside the top cover **20**.

[0244] Thus, the fluid may be discharged directly into the tub **50** through an empty space, avoiding the complex structure inside the top cover **20**. Accordingly, the space inside the top cover **20** may be efficiently used.

[0245] FIG. **18** shows a sprayer and a connector according to one embodiment of the present disclosure, and FIG. **19** is a cross-sectional view of the sprayer.

[0246] According to one embodiment of the present disclosure, the mounting part **300** may have a drain groove **392** formed by recessing a portion of the mounting groove **310**. The drain groove **392** may include a drain hole **391** through which the fluid is discharged. The drain hole **391** may be provided with a connector **400** connecting the drain hole **391** and the tub **50** for communication.

[0247] The laundry treating apparatus of the present disclosure may further include a sprayer **500** disposed facing the tub to spray water. The sprayer **500** may be disposed next to the manual

detergent supply device **100**.

[0248] The drain hole **391** may be connected to the sprayer **500** by the connector **400**. That is, one end of the connector **400** may be connected to the drain hole **391** and the opposite end of the connector **400** may be connected to the sprayer **500**.

[0249] Thereby, fluid remaining in the mounting groove **310** may be supplied to the tub **50** via the connector **400** using the pressure of water supplied from the water supply **70**.

[0250] The sprayer **500** may further include a drainage part **540** connected to the opposite end of the connector **400** and disposed facing the tub **50**. The drainage part **540** may include a drainage hose **541** connected to the opposite end of the connector **400** and a drainage nozzle **542** connected to the drainage hose **541** and disposed facing the tub **50** to spray water.

[0251] In other words, the drain hole **391** is connected to the drainage nozzle **542** on the side of the drainage part **540** by the connector **400**. In an embodiment, the two connectors **400** connected to the drain hole **391** may merge into the drainage hose **541**, and the drainage hose **541** may be connected to the drainage nozzle **542**.

[0252] The sprayer **500** may include a spray portion **530** connected to the water supply **70** and disposed facing the tub **50**. The water sprayed through the spray portion **530** may be supplied at a higher pressure than is normally supplied.

[0253] The spray portion **530** may include a spray hose **531** connected to the water supply **70** and a spray nozzle **532** connected to the spray hose **531** and disposed facing the tub **50** to spray water.

[0254] In this case, the spray nozzle **532** and the drainage nozzle **542** may be spaced apart from each other. In other words, fluid discharged through the drain hole **391** may be sprayed through the connector **400**, past the drainage hose **541** and the drainage nozzle **542** and into the tub **50**, but at a different location than water sprayed through the spray portion **530**.

[0255] FIG. **20** is an enlarged view showing the sprayer, and FIG. **21** is an enlarged view showing the sprayer.

[0256] The sprayer **500** may be covered by a sprayer cover **510**. The spray nozzle **532** may be positioned in the sprayer **500**. The spray nozzle **532** may be connected to the spray hose **531**. That is, the spray nozzle **532** may receive water from the water supply **70** and spray the same towards the inside of the tub **50**.

[0257] The sprayer **500** may include a bracket **520** on which the spray nozzle **532** is arranged. The bracket **520** may be coupled to the top cover **20**. The drainage nozzle **542** may be coupled to the bracket **520**.

[0258] In this case, the spray nozzle **532** and the drainage nozzle **542** may be spaced apart from each other. That is, the fluid discharged through the drain hole **391** may be sprayed through the connector **400**, past the drain hose **541** and the drainage nozzle **542**, and into the tub **50**, but at a different location than water sprayed through the spray portion **530**.

[0259] Thus, with the structure of the bracket **520** in which the spray nozzle **532** is arranged, any fluid such as laundry agent or water remaining in the mounting groove **310** may be drained through the drain hole **391** and discharged into the tub **50** through the connector **400** and the drainage nozzle **542**.

[0260] Thereby, the exposure of the drainage nozzle **542** to the user may be minimized and residual laundry agent or the like may be easily discharged.

## Claims

**1-15.** (canceled)

**16.** A laundry treating apparatus comprising: a cabinet having a top cover including an inlet; a tub located inside the cabinet, the tub being configured to store water therein; a drum rotatably located in the tub, the drum being configured to accommodate laundry therein; a mounting part located on the top cover, the mounting part being configured to deliver a first laundry agent to the tub; a first

storage part detachably mounted on the mounting part, the first storage part configured to store the first laundry agent, wherein the mounting part includes: a mounting groove configured to support the first storage part; a communication passage located in the mounting groove, the communication passage being configured to communicate with the first storage part; and a drain hole located in the mounting groove, the drain hole being in communication with the tub, wherein the first laundry agent stored in the first storage part is delivered to the tub through the mounting part, and wherein a fluid present in the mounting groove is discharged to the tub through the drain hole.

**17.** The laundry treating apparatus of claim 16, wherein the mounting groove is inclined downwardly towards the drain hole.

**18.** The laundry treating apparatus of claim 17, wherein the mounting groove further includes a drain groove recessed downward, the drain hole being located in the drain groove.

**19.** The laundry treating apparatus of claim 13, wherein the first storage part is configured to be detachable in a width direction of the cabinet.

**20.** The laundry treating apparatus of claim 19, wherein the mounting groove further includes a restriction surface located at an inner side or a first end of the mounting groove to support the first storage part, wherein the communication passage is located on the restriction surface, and wherein the drain hole is located in a bottom surface of the mounting groove.

**21.** The laundry treating apparatus of claim 16, further comprising a connector extending from the drain hole to allow the fluid present in the mounting groove to flow therethrough.

**22.** The laundry treating apparatus of claim 21, further comprising a second storage part provided in the top cover to store a second laundry agent therein, wherein a first end of the connector is connected to the drain hole, and wherein a second end of the connector is connected to the second storage part to discharge the fluid present in the mounting groove into the tub through the second storage part.

**23.** The laundry treating apparatus of claim 22, wherein the connector is a hose.

**24.** The laundry treating apparatus of claim 22, wherein the second storage part includes a wash hole located at a position corresponding to the drain hole, and wherein the second end of the connector is connected to the wash hole.

**25.** The laundry treating apparatus of claim 24, wherein the connector is integrally formed with the mounting part.

**26.** The laundry treating apparatus of claim 25, further comprising a gasket located along an outer circumferential surface of the connector at the second end of the connector.

**27.** The laundry treating apparatus of claim 26, wherein the second storage part includes: a first body; a drawer slidably mounted in the first body.

**28.** The laundry treating apparatus of claim 27, wherein the second storage part includes a second body located between the drawer and an upper surface of the first body, the second body configured to store the second laundry agent therein.

**29.** The laundry treating apparatus of claim 22, wherein the second storage part includes: a first body; a drawer slidably mounted in the first body.

**30.** The laundry treating apparatus of claim 29, wherein the second storage part includes a second body located between the drawer and an upper surface of the first body, the second body configured to store the second laundry agent therein.

**31.** The laundry treating apparatus of claim 21, wherein a first end of the connector is connected to the drain hole, and wherein a second end of the connector is at an open top of the tub.

**32.** The laundry treating apparatus of claim 21, further comprising a sprayer facing the tub, wherein a first end of the connector is connected to the drain hole, and wherein a second end of the connector is connected to the sprayer.

**33.** The laundry treating apparatus of claim 32, further comprising a water supply provided at the cabinet to supply water to the tub, wherein the sprayer includes a spray nozzle connected to the water supply, the spray nozzle being arranged to face the tub.

- 34.** The laundry treating apparatus of claim 33, wherein the sprayer further includes a drainage nozzle connected to the second end of the connector, the drainage nozzle being arranged to face the tub, and wherein the spray nozzle and the drainage nozzle are spaced apart from each other.
- 35.** The laundry treating apparatus of claim 16, wherein the first storage part is detachably mounted on the mounting part in a height direction of the cabinet, and wherein a bottom surface of the mounting groove includes the communication passage and the drain hole.
-