



(11)

EP 4 740 815 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
13.05.2026 Bulletin 2026/20

(51) International Patent Classification (IPC):
A47L 9/00 (2006.01)

(21) Application number: **23944914.3**

(52) Cooperative Patent Classification (CPC):
A47L 9/00

(22) Date of filing: **24.11.2023**

(86) International application number:
PCT/CN2023/134001

(87) International publication number:
WO 2025/010908 (16.01.2025 Gazette 2025/03)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **WANG, Qi**
Suzhou, Jiangsu 215100 (CN)
• **ZHANG, Chenzhou**
Suzhou, Jiangsu 215100 (CN)
• **CAO, Xiuchao**
Suzhou, Jiangsu 215100 (CN)
• **LIU, Zhigang**
Suzhou, Jiangsu 215100 (CN)
• **NI, Timin**
Suzhou, Jiangsu 215100 (CN)
• **BU, Hengfeng**
Suzhou, Jiangsu 215100 (CN)

(30) Priority: **11.07.2023 CN 202321813201 U**

(74) Representative: **RGTH**
Patentanwälte PartGmbH
Mönckebergstraße 11
20095 Hamburg (DE)

(71) Applicants:
• **Jiangsu Midea Cleaning Appliances Co., Ltd.**
Suzhou Jiangsu 215100 (CN)
• **Midea Group Co., Ltd.**
Foshan, Guangdong 528311 (CN)

(54) **CLEANING SYSTEM**

(57) The present application relates to the technical field of cleaning device and provides a cleaning system. The cleaning system comprises a base station, a vacuum cleaner, and a primary lock and an unlock mechanism. A dust collection bin is formed in the base station. The vacuum cleaner comprises a dust cup assembly comprising a dust cup and a covering door, the dust cup is formed with a dust collection chamber and a dust discharge opening communicated with the dust collection chamber, and the covering door can selectively open or close the dust discharge opening. The primary lock is disposed at a junction between the dust cup and the covering door, and is configured for selectively locking or unlocking the covering door. The unlocking mechanism comprises a primary unlocking member and a secondary lock, and the secondary lock is disposed on the base station. In a state that the vacuum cleaner is docked with the base station, the primary unlocking member enables the primary lock to unlock the covering door, and the secondary lock can selectively lock or unlock the covering door. The cleaning system provided in this

application is capable of improving user control of a vacuum cleaner.

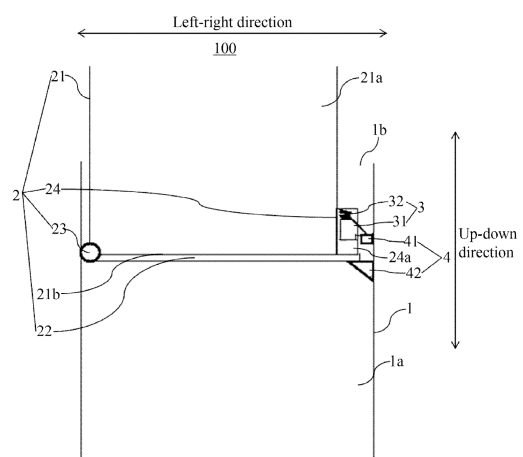


FIG. 1

EP 4 740 815 A1

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on and claims priority to Chinese patent application No. 202321813201.4, filed on July 11, 2023. The entire contents of the above-mentioned Chinese patent application are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present application relates to the technical field of cleaning device, in particular to a cleaning system.

BACKGROUND

[0003] A vacuum cleaner comprises a dust cup and a covering door. In order to clear foreign objects in the dust cup, the vacuum cleaner is equipped with a base station. When in use, the vacuum cleaner is inserted into the base station to clear the foreign objects in the dust cup. In the related art, after the vacuum cleaner is inserted into the base station, the covering door will automatically open, so that the foreign objects in the dust cup will automatically fall into the base station, and the user's controllability of the vacuum cleaner is decreased.

SUMMARY

[0004] In view of this, embodiments of the present application provide a cleaning system capable of improving user control of a vacuum cleaner.

[0005] In order to achieve the above purpose, the technical solutions of the embodiments of the present application can be achieved as follows:

[0006] An embodiment of the present application discloses a cleaning system comprising: a base station, a vacuum cleaner, a primary lock and an unlocking mechanism.

[0007] A dust collection bin is formed in the base station.

[0008] The vacuum cleaner comprises a dust cup assembly, the dust cup assembly comprising a dust cup and a covering door. The dust cup is formed with a dust collection chamber and a dust discharge opening communicated with the dust collection chamber, and the covering door is configured to selectively open or close the dust discharge opening.

[0009] The primary lock is disposed at a junction of the dust cup and the covering door, and is configured to selectively lock or unlock the covering door.

[0010] The unlocking mechanism comprises a primary unlocking member and a secondary lock. The secondary lock is disposed at the base station. In a state where the vacuum cleaner is docked with the base station, the primary unlocking member allows the primary lock to unlock the covering door, and the secondary lock selec-

tively locks or unlocks the covering door.

[0011] The embodiment of the present application discloses the cleaning system. By forming the dust collection chamber and the dust discharge opening in the dust cup, the covering door can selectively open or close the dust discharge opening, and the primary lock can selectively lock or unlock the covering door. In this way, when the vacuum cleaner operates on a surface to be cleaned, the primary lock can lock the covering door to close the dust discharge opening. In this way, foreign objects such as dust or garbage in the dust collection chamber can be prevented from leaking out of the dust cup through the dust discharge opening. By forming the dust collection bin in the base station, when it is necessary to clear foreign objects in the dust collection chamber, the vacuum cleaner can be inserted into the base station, and the primary unlocking member can enable the primary lock to unlock the covering door, and the primary lock is in an unlocked state. In this way, when the user does not want to clean the dust collection chamber or forgets to load the dust bag, the covering door can be locked by the secondary lock, so as to avoid accidental opening of the covering door. When the dust collection chamber needs to be cleaned, the covering door can be unlocked by operating the secondary lock to open the dust discharge opening. In this way, the opening of the covering door can meet the subjective will of the user, and the user's control of the vacuum cleaner can be improved. After the primary unlocking member enables the primary lock to unlock the covering door and the secondary lock unlocks the covering door, the foreign objects in the dust collection chamber can be collected in the dust collection bin through the dust discharge opening, so that the cleanliness in the dust collection chamber can be maintained, thereby providing a good foreign objects and dust storage space for the next cleaning of the surface to be cleaned.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a structural schematic diagram of a cleaning system provided by an embodiment of the present application, in which a primary unlocking member allows a first locking sub-element to unlock a covering door, and a second lock locks the covering door; FIG. 2 is a structural schematic diagram of a cleaning system provided by another embodiment of the present application, in which a primary unlocking member allows a first locking sub-element to unlock a covering door, and a second lock unlocks the covering door; FIG. 3 is a structural schematic diagram of the vacuum cleaner and the primary lock of FIG. 1 and, in which the primary lock locks the covering door; and FIG. 4 is a structural schematic diagram of the primary lock of FIG. 1.

DETAILED DESCRIPTION

[0013] It should be noted that, in the case of no conflict, embodiments in this application and technical characteristics in the embodiments can be combined with each other, and the detailed description in the specific implementations should be understood as an explanation of the purpose of this application, and should not be regarded as an improper limitation of this application.

[0014] The present application will be further described in detail with reference to the accompanying drawings and specific embodiments. Descriptions such as "first" and "second" in the embodiments of the present application are for descriptive purposes only, and cannot be understood as indicating or implying their relative importance or implicitly comprising at least one feature.

[0015] An embodiment of the present application provides a cleaning system, see FIGS. 1 to 4. The cleaning system 100 comprises a base station 1, a vacuum cleaner 2, a primary lock 3 and an unlocking mechanism 4. A dust collection bin 1a is formed in the base station 1. The vacuum cleaner 2 comprises a dust cup assembly, the dust cup assembly comprises a dust cup 21 and a covering door 22, the dust cup 21 has a dust collection chamber 21a and a dust discharge opening 21b communicated with the dust collection chamber 21a, and the covering door 22 may selectively open or close the dust discharge opening 21b. The unlocking mechanism 4 comprises a primary unlocking member 41 and a secondary lock 42, and the secondary lock 42 is disposed at the base station 1. In a state where the vacuum cleaner 2 is docked with the base station 1, the primary unlocking member 41 allows the primary lock 3 to unlock the covering door 22, and the secondary lock 42 can selectively lock or unlock the covering door 22.

[0016] In the cleaning system 100 provided in the embodiment of the present application, the dust collection chamber 21a and the dust discharge opening 21b are formed in the dust cup 21, the covering door 22 can selectively open or close the dust discharge opening 21b, and the primary lock 3 can selectively lock or unlock the covering door 22. In this way, when the vacuum cleaner 2 operates on a surface to be cleaned, the first lock 3 can lock the covering door 22 to close the dust discharge opening 21b, so that foreign objects such as dust or garbage in the dust collection chamber 21a can be prevented from leaking out of the dust cup 21 through the dust discharge opening 21b. Since the dust collection bin 1a is formed in the base station 1, when the foreign objects in the dust collection chamber 21a needs to be cleared, the vacuum cleaner 2 is docked with the base station 1, and then the primary unlocking member 41 can cause the primary lock 3 to unlock the covering door 22, the primary lock 3 thus is in an unlocked state. In this way, when the user does not want to clean the dust collection chamber 21a or forgets to load a dust bag, the covering door 22 can be locked by the secondary lock 42, so as to prevent the covering door 22 from being opened by

mistake. When the dust collection chamber 21a needs to be cleaned, the covering door 22 can be unlocked by operating the secondary lock 42 to open the dust discharge opening 21b. In this way, the opening of the covering door 22 can be made to meet the subjective wishes of the user, and the user's control on the vacuum cleaner 2 can be improved. After the primary unlocking member 41 allows the primary lock 3 to unlock the covering door 22 and the secondary lock 42 unlocks the covering door 22, the foreign objects in the dust collection chamber 21a can be collected in the dust collection bin 1a through the dust discharge opening 21b, so that the cleaning of the dust collection chamber 21a can be maintained, and a good foreign object and dust storage space can be provided for the next cleaning of the surface to be cleaned.

[0017] As an example, in one embodiment, in order to open the dust discharge opening 21b of the vacuum cleaner 2 in the base station 1, two unlocking operations are required. The first unlocking operation is to unlock the primary lock 3 by the primary unlocking member 41, so that the bondage between the covering door 22 and the dust cup 21 can be released, and the primary lock 3 thus is in an unlocked state. The second unlocking operation is to unlock the covering door 22 by the secondary lock 42. As such, the two unlocking operations are completed, and the dust discharge opening 21b is opened.

[0018] As an example, in one embodiment, the vacuum cleaner 2 may be hooked to outside of the base station 2.

[0019] In some embodiments, the primary unlocking member 41 may be provided on the base station 1.

[0020] As an example, in an embodiment, the primary unlocking member 41 may be provided in the dust collection bin 1a, so that the primary unlocking member 41 can be protected to a certain extent and its service life can be increased.

[0021] In other embodiments, the primary unlocking member 41 may also be provided on the vacuum cleaner 2.

[0022] It should be noted that the dust collection bin 1a described herein is a bin or chamber for accommodating the dust cup 21, and in particular, the dust collection bin 1a may be a dust collection air duct, or a dust debris collection part of the base station 1.

[0023] As an example, in one embodiment, the shape of the dust cup 21 is not limited, for example, it may be cylindrical, or conical, etc.

[0024] As an example, in one embodiment, the vacuum cleaner 2 may be, but is not limited to, a handheld vacuum cleaner 2. First, the handheld vacuum cleaner is small and light, and can be easily carried, thus avoiding the inflexibility and bulkiness of the vacuum cleaner 2 in the related art. Second, the handheld vacuum cleaner 2 has a wide applicability, which can clean various cleaning occasions such as floors, carpets, sofas and mattresses. Third, the handheld vacuum cleaner 2 is convenient to use, which does not need to drag a long dust suction pipe,

a plug, etc.

[0025] In one embodiment, referring to FIGS. 1 to 3, the covering door 22 is rotatably connected to the dust cup 21. In this way, by rotating the covering door 22 about the rotation axis, the dust discharge opening 21b can be opened or closed.

[0026] As an example, in one embodiment, referring to FIGS. 1 to 3, the vacuum cleaner 2 comprises a rotating shaft 23, a first rotating aperture formed on a side of the covering door 22 away from the primary lock 3, and a second rotating aperture formed on a side of the dust cup 21 away from the primary lock 3, the rotating shaft 23 passes through the first rotating aperture and the second rotating aperture. In this way, the covering door 22 can be rotated by the rotating shaft 23 and the rotating aperture. On the one hand, the number of components required for the rotation of the rotating shaft 23 and the rotating aperture is small, maintenance is easy and reliability is high; on the other hand, the rotation of the rotating shaft 23 and the rotating aperture does not need to use a complicated hydraulic and pneumatic system, has low maintenance cost, and is easy to be realized.

[0027] In one embodiment, referring to FIGS. 1 to 4, the primary lock 3 comprises a first locking sub-element 31 and a second locking member, the first locking sub-element 31 being slidably disposed on an outer wall of the dust cup 21. For example, the first locking sub-element 31 may be provided on the outer wall on a side of the dust cup 21 away from the second rotating aperture. The second locking sub-element is provided on the covering door 22. As an example, the second locking sub-element may be provided on a side of the covering door 22 away from the first rotating aperture to avoid structural interference.

[0028] The first locking sub-element 31 and the second locking sub-element cooperate to selectively lock or unlock the covering door 22. In a state where the vacuum cleaner 2 is docked with the base station 1, the primary unlocking member 41 pushes the first locking sub-element 31 to slide, so that the first locking sub-element 31 is separated from the second locking sub-element. In this way, when it is necessary to clean the foreign objects in the dust collection chamber 21a, the vacuum cleaner 2 can be docked with the base station 1, and the primary unlocking member 41 in the dust collection bin 1a will contact the first locking sub-element 31 on the dust cup 21 to push the first locking sub-element 31 to slide, so that the first locking sub-element 31 and the second locking sub-element are separated from each other due to relative movement therebetween to complete the unlocking of the covering door 22 by the primary unlocking member 41. At this time, the primary lock 3 is in an unlocked state, so that the user subsequently can open or close the dust discharge opening 21b on his/her subjective wishes.

[0029] As an example, in one embodiment, a mounting groove may be provided in the covering door 22, and the second locking sub-element may be fixed in the mounting

groove, so that a stable cooperating position may be provided for the first locking sub-element 31.

[0030] As an example, in one embodiment, the second locking sub-element is bonded to the covering door 22 by a viscous material such as glue, so that forming a groove in the covering door 22 can be avoided, thereby reducing damage to the covering door 22.

[0031] In one embodiment, the first locking sub-element 31 cooperates with the second locking sub-element in a magnetic attraction manner. In this way, the connection of the both sub-elements can be realized through the magnetic attraction method without external force, which is convenient to use, simple and easy to operate, and has high stability.

[0032] In one embodiment, one of the first locking sub-element 31 and the second locking sub-element is a magnetic body, and the other one of the first locking sub-element 31 and the second locking sub-element is a material magnetically attracted to the magnetic body. As an example, the magnetic member may be a permanent magnet or an electromagnet, and the material magnetically attracted to the magnetic member may be a material such as iron, nickel, or chromium. For example, one of the first locking sub-element 31 and the second locking sub-element is a permanent magnet, and the other one of the first locking sub-element 31 and the second locking member is a ferromagnetic material such as iron, nickel, or chromium. Further, for example, one of the first locking sub-element 31 and the second locking sub-element 31 is an electromagnet, and the other one of the first locking sub-element 31 and the second locking sub-element is a material such as iron, nickel, or chromium.

[0033] In one embodiment, both the first locking sub-element 31 and the second locking sub-element 31 are magnetic bodies. For example, both the first locking sub-element 31 and the second locking sub-element may be permanent magnets. Further, for example, both the first locking sub-element 31 and the second locking sub-element may be electromagnets. Furthermore, for example, one of the first locking sub-element 31 and the second locking sub-element is an electromagnet, and the other one of the first locking sub-element 31 and the second locking sub-element is a permanent magnet.

[0034] In one embodiment, one of the first locking sub-element 31 and the second locking sub-element is a snap, the other one of the first locking sub-element 31 and the second locking sub-element is a slot, and the snap is snap-fitted into the slot. As an example, the first locking sub-element 31 may be a snap and the second locking sub-element may be a slot, in this way, on the one hand, the connection mode between the snap and the slot has strong connection strength and stability, so that the covering door 22 is not easily disengaged when the vacuum cleaner 2 is in operation; on the other hand, the snap-fit mode makes the connection and disconnection between the dust cup 21 and the covering door 22 relatively simple. In other embodiments, the first locking

sub-element 31 may be a slot and the second locking sub-element may be a snap.

[0035] In one embodiment, referring to FIGS. 1 and 2, an entry and exit opening 1b is formed on an upper surface of the dust collection bin 1a, the dust discharge opening 21b is formed on a lower surface of the dust cup 21, and the covering door 22 enters and exits the dust collection bin 1a in an up-down direction through the entry and exit opening 1b. In this way, when it is necessary to clear the foreign objects in the dust collection chamber 21a, the covering door 22 can be inserted into the dust collection bin 1a through the entry and exit opening 1b in the up-down direction. On the one hand, the vacuum cleaner 2 is inserted into the base station 1 in the up-down direction, which can reduce the footprint of the cleaning system 100, and further facilitate insertion or removal operations made by the user. On the other hand, since the entry and exit opening 1b is formed on the upper surface of the dust collection bin 1a and the dust discharge opening 21b is formed on the lower surface of the dust cup 21, the foreign objects in the dust collection chamber 21a can fall into the dust collection bin 1a by their own gravities, the cleaning thus is relatively simple. Furthermore, after the secondary lock 42 unlocks the covering door 22, the covering door 22 can rotate about the rotating shaft 23 by its own gravity, so as to open the dust discharge opening 21b.

[0036] In one embodiment, referring to FIGS. 1 to 4, the vacuum cleaner 2 comprises a housing 24 connected to an outer peripheral surface of the dust cup 21, and the housing 24 and the outer peripheral surface of the dust cup 21 together define an accommodating chamber 24a. As an example, the housing 24 may be provided on a side of the dust cup 21 away from the second rotating aperture; the shape of the housing 24 is not limited, for example, the housing 24 may be a hollow cylindrical housing so that the accommodating chamber 24a is substantially cylindrical. The accommodating chamber 24a is provided with a communication opening 24b facing the covering door 22. That is, the bottom of the accommodating chamber 24a is provided with an opening. In a state where the vacuum cleaner 2 is docked with the base station 1, the accommodating chamber 24a can be communicated with the dust collection bin 1a through the communication opening 24b.

[0037] An extending opening 24c communicating with the accommodating chamber 24a is provided on a circumferential side of the housing 24, and a portion of the first locking sub-element 31 is provided in the accommodating chamber 24a. In this way, on the one hand, the first locking sub-element 31 can be protected to a certain extent, so as to increase the service life of the first locking sub-element 31; on the other hand, a portion of the first locking sub-element 31 is provided in the accommodating chamber 24a, so that in a state where the vacuum cleaner 2 is docked with the base station 1, when the first locking sub-element 31 is pushed by the primary unlocking member 41 to slide, the accommodating chamber

24a can play a certain guiding role on the first locking sub-element 31 and provide a movement space for the first locking sub-element 31, thereby avoiding the situation that the first locking sub-element 31 and the second locking sub-element cannot be separated, and the working stability is good.

[0038] The first locking sub-element 31 cooperates with the second locking sub-element through the communication opening 24b. For example, in a state where the covering door 22 is pulled out of the dust collection bin 1a upwardly, the first locking sub-element 31 slides downwards, for example, under the action of the elastic member 32, so that a portion of the first locking sub-element 31 slides to the vicinity of the communication opening 24b. At this time, the covering door 22 is rotated about the rotating shaft 23 towards a direction approaching the first locking sub-element 31 to close the dust discharge opening 21b, and the second locking sub-element on the covering door 22 is cooperatively connected with the first locking sub-element 31 to lock the covering door 22.

[0039] The portion of the first locking sub-element 31 passing through the extending opening 24c is configured to contact the primary unlocking member 41. For example, taking the vacuum cleaner 2 inserted downwards into the dust collection bin 1a as an example, in a state where the vacuum cleaner 2 is docked with the base station 1, the portion of the first locking sub-element 31 passing through the extending opening 24c is contacted and pushed by the primary unlocking member 41, thereby driving the portion of the first locking sub-element 31 located in the accommodating chamber 24a to slide upwards, causing the portion of the first locking sub-element 31 located at the communication opening 24b to enter the accommodating chamber 24a, so that the first locking sub-element 31 is separated from the second locking sub-element, the covering door 22 is then unlocked, and the dust discharge opening 21b is in a state to be opened.

[0040] As an example, in one embodiment, the entire primary unlocking member 41 may be located in the dust collection bin 1a, for example, the primary unlocking member 41 may be a stopper, one end of the primary unlocking member 41 is fixed on a wall of the dust collection bin 1a, and another end of the primary unlocking member 41 extends towards a direction approaching the dust cup 21. Taking the vacuum cleaner 2 inserted into the dust collection bin 1a as an example, the portion of the first unlocking sub-element 31 passing through the extending opening 24c will contact an extension part of the primary unlocking member 41 to prevent the first unlocking sub-element 31 from continuing to move downwards, so that there is a relative movement between the first unlocking sub-element 31 and the covering door 22, causing the portion of the first unlocking sub-element 31 located at the communication opening 24b to be separated from the second unlocking sub-element, and thus the covering door 22 is unlocked. In this way, the appear-

ance of the base station 1 can be clean and tidy by placing the entire first locking sub-element 31 in the dust collection bin 1a.

[0041] In some embodiments, a portion of the primary unlocking member 41 may be located within the dust collection bin 1a and another portion of the primary unlocking member 41 may extend to outside the dust collection bin 1a, and the portion of the primary unlocking member 41 located within the dust collection bin 1a can contact with the first locking sub-element 31.

[0042] As an example, in one embodiment, the accommodating chamber 24a is separated from the dust collection chamber 21a, that is, foreign objects in the dust collection chamber 21a cannot enter into the accommodating chamber 24a, thereby preventing the foreign objects from leaking out of the vacuum cleaner 2 through the communication opening 24b and the extending opening 24c thereon, and thus the sealing effect of the dust collection chamber 21a is good.

[0043] In one embodiment, referring to FIGS. 1 to 4, the primary lock 3 comprises an elastic member 32 connected to the first locking sub-element 31. As an example, the elastic member 32 may be provided in the accommodating chamber 24a, for example, one end of the elastic member 32 is connected to a top wall of the accommodating chamber 24a, and another end of the elastic member 32 is connected to a side of the first locking sub-element 31 away from the communication opening 24b, so that the elastic member 32 can perform compression and elongation by taking the top wall of the accommodating chamber 24a as a support point, thereby driving the first locking sub-element 31 to slide.

[0044] In a state where the vacuum cleaner 2 is docked with the base station 1, the primary unlocking member 41 pushes the first locking sub-element 31 to drive the elastic member 32 to undergo elastic deformation. For example, taking the vacuum cleaner 2 inserted downwardly into the dust bin 1a as an example, in a state where the vacuum cleaner 2 is docked with the base station 1, a portion of the first locking sub-element 31 passing through the extending opening 24c contacts the extension portion of the primary unlocking member 41 to prevent the first locking sub-element 31 from continuing to move downwards. In this way, the first locking sub-element 31 presses the elastic member 32 upwardly, so that the portion of the first locking sub-element 31 located at the communication opening 24b is separated from the second locking sub-element, and the covering door 22 is unlocked. In this way, by providing the elastic member 32, a certain pre-tightening force can be provided to reduce the accidental unlocking of the covering door 22 and improve the reliability of unlocking the covering door 22. In a state where the covering door 22 is removed from the dust collection bin 1a, the elastic member 32 resumes elastic deformation to reset the first locking sub-element 31. For example, taking vacuum cleaner 2 inserted downwards into dust collection bin 1a as an example, after the foreign objects in the dust collection

chamber 21a are discharged into the dust collection bin 1a, and during the vacuum cleaner 2 is pulled upwardly out of the dust collection bin 1a, the elastic member 32 resumes elastic deformation, thereby pushing the first locking sub-element 31 downwardly, so that the portion of the first locking sub-element 31 away from the elastic member 32 automatically approaches the communication opening 24b. In this way, when the covering door 22 is rotated about the rotating shaft 23 towards the direction approaching the first locking sub-element 31, the portion of the first locking sub-element 31 close to the communication opening 24b will be fit and connected with the second locking sub-element, and the covering door 22 is locked.

[0045] As an example, in one embodiment, the elastic member 32 may be a spring, so that springs made of different materials can be selected according to different requirements to provide different pretension forces, which has a high selectivity and a low manufacturing cost.

[0046] In one embodiment, referring to FIGS. 1 and 2, the secondary lock 42 can lock the lower surface of the covering door 22 or unlock the covering door 22 in a state where the vacuum cleaner 2 is docked with the base station 1. For example, the shape of the secondary lock 42 is not limited, for example, it may be a square, rectangular or triangular block. The base station 1 is formed with a cutout, which is communicated with the dust collection bin 1a, and in which the secondary lock 42 is movably arranged. Taking the vacuum cleaner 2 inserted downwardly into the dust collection bin 1a as an example, in the state where the vacuum cleaner 2 is docked with the base station 1, a portion of the secondary lock 42 located in the dust collection bin 1a through the cutout abuts against the lower surface of the covering door 22, resulting in the covering door 22 being unable to rotate about the rotating shaft 23 towards a direction away from the first locking sub-element 31, that is, the covering door 22 at this time cannot be opened due to being locked by the secondary lock 42. The secondary lock 42 is moved so that the secondary lock 42 is away from the covering door 22, and the secondary lock 42 cannot continue to abut against the covering door 22 to allow unlocking of the covering door 22. At this time, the covering door 22 can be rotated about the rotating shaft 23 towards a direction away from the first locking sub-element 31 to open the covering door 22, and then the foreign objects in the dust collection chamber 21a can enter the dust collection bin 1a through the dust discharge opening 21b, so as to complete the removal of the foreign objects in the dust collection chamber 21a, and provide a good storage space for the next cleaning of the surface to be cleaned.

[0047] As an example, in one embodiment, referring to FIGS. 1 and 2, the secondary lock 42 abuts against the lower surface of the covering door 22 or dodges the covering door 22 in a push-pull manner in the horizontal direction. For example, when the covering door 22 needs to be locked, the secondary lock 42 can be pushed into the dust collection bin 1a through the cutout, so that in the

state where the vacuum cleaner 2 is docked with the base station 1, the lower surface of the covering door 22 can be abutted against the secondary lock 42 to lock the covering door 22. When it is necessary to dodge the covering door 22 to open the dust discharge opening 21b, the secondary lock 42 can be pulled out of the dust collection bin 1a through the cutout, so that there is no obstruction below the covering door 22, and the covering door 22 then can be rotated about the rotating shaft 23 towards a direction away from the first locking sub-element 31, thereby opening the dust discharge opening 21b. As an example, in one embodiment, the secondary lock 42 can also be pressed in an up-down direction to lock the lower surface of the covering door 22 or unlock the covering door 22. Since the rotation track of the covering door 22 about the rotating shaft 23 at the second locking sub-element is circular, when it is necessary to dodge the covering door 22 to open the dust discharge opening 21b, the secondary lock 42 can be pressed downward to move it away from the rotation track of the covering door 22. In this way, the covering door 22 can be dodged.

[0048] As an example, in one embodiment, the unlocking mechanism 4 comprises an elastomer which may be provided on the right side of the secondary lock 42 and which may automatically keep the secondary lock 42 in a locked state; when it is necessary to unlock, the secondary lock 42 can be pulled out of the dust collection bin 1a by an external force. At this time, the covering door 22 falls, and after the corresponding operation is stopped, the secondary lock 42 automatically moves into the dust collection bin 1a.

[0049] In one embodiment, referring to FIGS. 1 and 2, the primary unlocking member 41 is located above the secondary lock 42. In this way, in the state where the vacuum cleaner 2 is docked with the base station 1, the primary unlocking member 41 first causes the primary lock 3 to automatically unlock the covering door 22, and the primary lock 3 is in the unlocked state, and then the user can operate the secondary lock 42 to lock the covering door 22 or unlock the covering door 22 by judging whether or not it is necessary to remove the foreign objects in the dust collection chamber 21a, thereby improving the user's control of the vacuum cleaner 2.

[0050] In one embodiment, the cleaning system 100 comprises an electric motor provided on the base station 1 and configured to suck the gas of the dust collection bin 1a. The secondary lock 42 is operated and the electric motor is started in a state where the vacuum cleaner 2 is docked with the base station 1. For example, the electric motor may be a suction electric motor, and the electric motor may be arranged on the base station 1, and may be communicated with the dust collection bin 1a through a pipe to suck the gas in the dust collection bin 1a, so that the dust collection bin is in a negative pressure state. In this way, in a state that the vacuum cleaner 2 is docked with the base station 1, the primary unlocking member 41 causes the primary lock 3 to automatically unlock the covering door 22, then the secondary lock 42 is operated

to unlock the covering door 22, the covering door 22 is finally automatically opened by the pressure difference between the dust collection chamber 21a and the dust collection bin 1a, so that the dust collection chamber 21a is in communication with the dust collection bin 1a. In this way, foreign objects in the dust collection chamber 21a can be removed relatively quickly and cleanly.

[0051] As an example, in one embodiment, the cleaning system 100 comprises a torsion spring, the torsion spring is sleeved on the rotating shaft 23, the electric motor is started, the covering door 22 is opened, and the torsion spring stores potential energy with the rotation of the rotating shaft 2. After removing the foreign objects in the dust collection chamber 21a, the electric motor is turned off, and the torsion spring releases potential energy, so that the covering door 22 rotates towards a direction approaching the dust cup 21, to close the dust discharge opening 21b.

[0052] The foregoing is only a preferred embodiment of the present application, and is not intended to limit the present application. For those skilled in the art, the present application may be subject to various modifications and variations. All modifications, equivalent replacements, improvements, etc. within the spirit and principles of this application are comprised in the scope of protection of this application.

Claims

1. A cleaning system comprising:

a base station, wherein a dust collection bin is formed in the base station;
a vacuum cleaner comprising a dust cup assembly, the dust cup assembly comprising a dust cup and a covering door, wherein the dust cup is formed with a dust collection chamber and a dust discharge opening communicated with the dust collection chamber, and the covering door is configured to selectively open or close the dust discharge opening;
a primary lock arranged at a junction of the dust cup and the covering door, configured to selectively lock or unlock the covering door; and
an unlocking mechanism comprising a primary unlocking member and a secondary lock, wherein the secondary lock is arranged at the base station; in a state where the vacuum cleaner is docked with the base station, the primary unlocking member allows the primary lock to unlock the covering door, and the secondary lock selectively locks or unlocks the covering door.

2. The cleaning system of claim 1, wherein the primary lock comprises a first locking sub-element slidably disposed on an outer wall of the dust cup and a

second locking sub-element disposed on the covering door, wherein the first locking sub-element and the second locking sub-element cooperate to selectively lock or unlock the covering door; in a state where the vacuum cleaner is docked with the base station, the primary unlocking member pushes the first locking sub-element to slide, so that the first locking sub-element is separated from the second locking sub-element.

3. The cleaning system of claim 2, wherein the first locking sub-element cooperates with the second locking sub-element in a magnetic attraction manner.

4. The cleaning system of claim 3, wherein one of the first locking sub-element and the second locking sub-element is a magnetic body, another one of the first locking sub-element and the second locking sub-element is a material magnetically attracted to the magnetic body, or, both the first locking sub-element and the second locking sub-element are magnetic bodies.

5. The cleaning system according to claim 2, wherein the vacuum cleaner comprises a housing connected to an outer peripheral surface of the dust cup, the housing and the outer peripheral surface of the dust cup together define an accommodating chamber, the accommodating chamber being formed with a communication opening towards the covering door, an extending opening communicating with the accommodating chamber is formed on a circumferential side of the housing, a portion of the first locking sub-element is arranged in the accommodating chamber, the first locking sub-element cooperates with the second locking sub-element through the communication opening, and a portion of the first locking sub-element passing through the extending opening is configured for contacting the unlocking member.

6. The cleaning system of claim 2, wherein the primary lock comprises an elastic member connected to the first locking sub-element; in a state where the vacuum cleaner is docked with the base station, the primary unlocking member pushes the first locking sub-element to drive the elastic member to undergo elastic deformation; and in a state where the covering door is removed from the dust collection bin, the elastic member resumes elastic deformation to reset the first locking sub-element.

7. The cleaning system of claim 1, wherein an upper surface of the dust collection bin is formed with an entry and exit opening, the dust discharge opening is formed on a lower surface of the dust cup, and the

covering door enters and exits the dust collection bin in an up-down direction through the entry and exit opening.

8. The cleaning system of claim 7, wherein the secondary lock is capable of locking a lower surface of the covering door or unlocking the covering door, in a state where the vacuum cleaner is docked with the base station.

9. The cleaning system of claim 1, wherein the covering door is rotatably connected to the dust cup.

10. The cleaning system of claim 7, wherein the primary unlocking member is disposed in the dust collection bin and the primary unlocking member is located above the secondary lock.

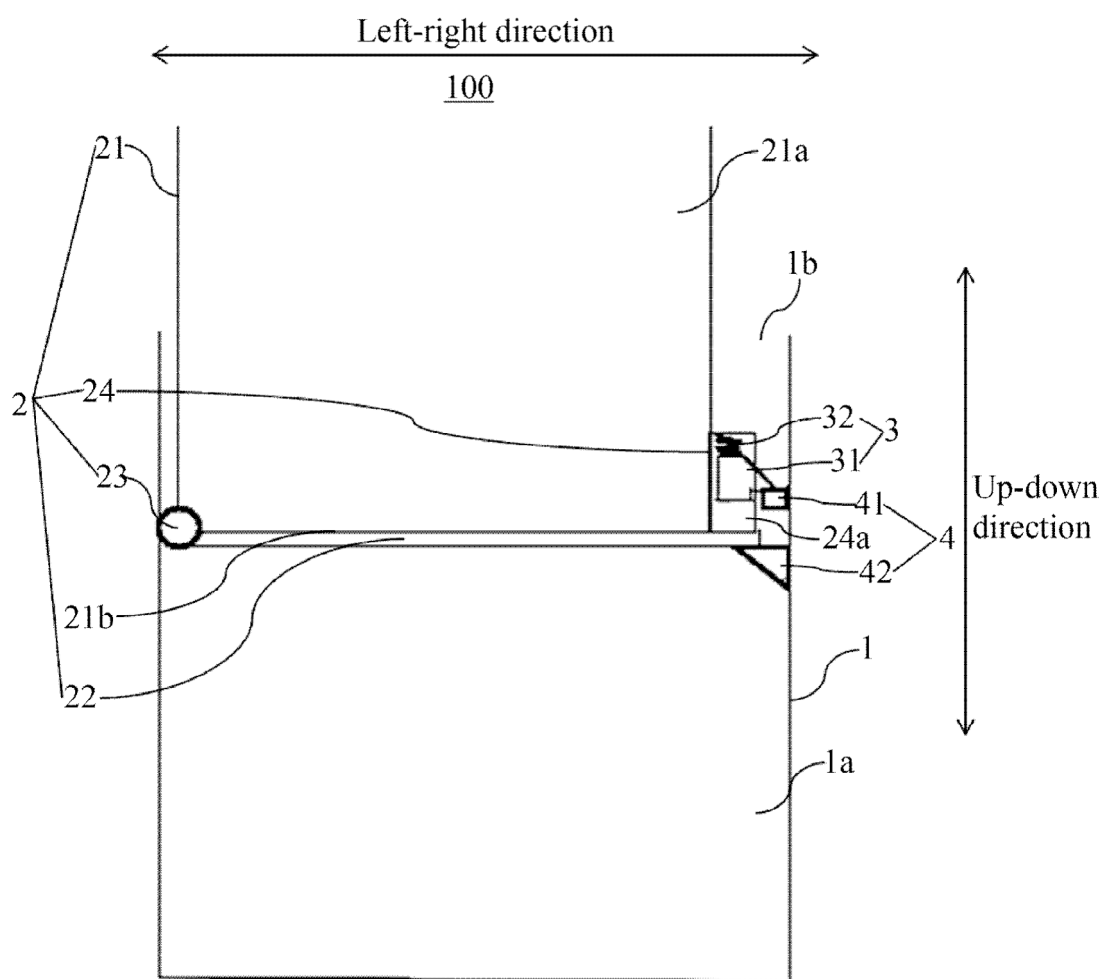


FIG. 1

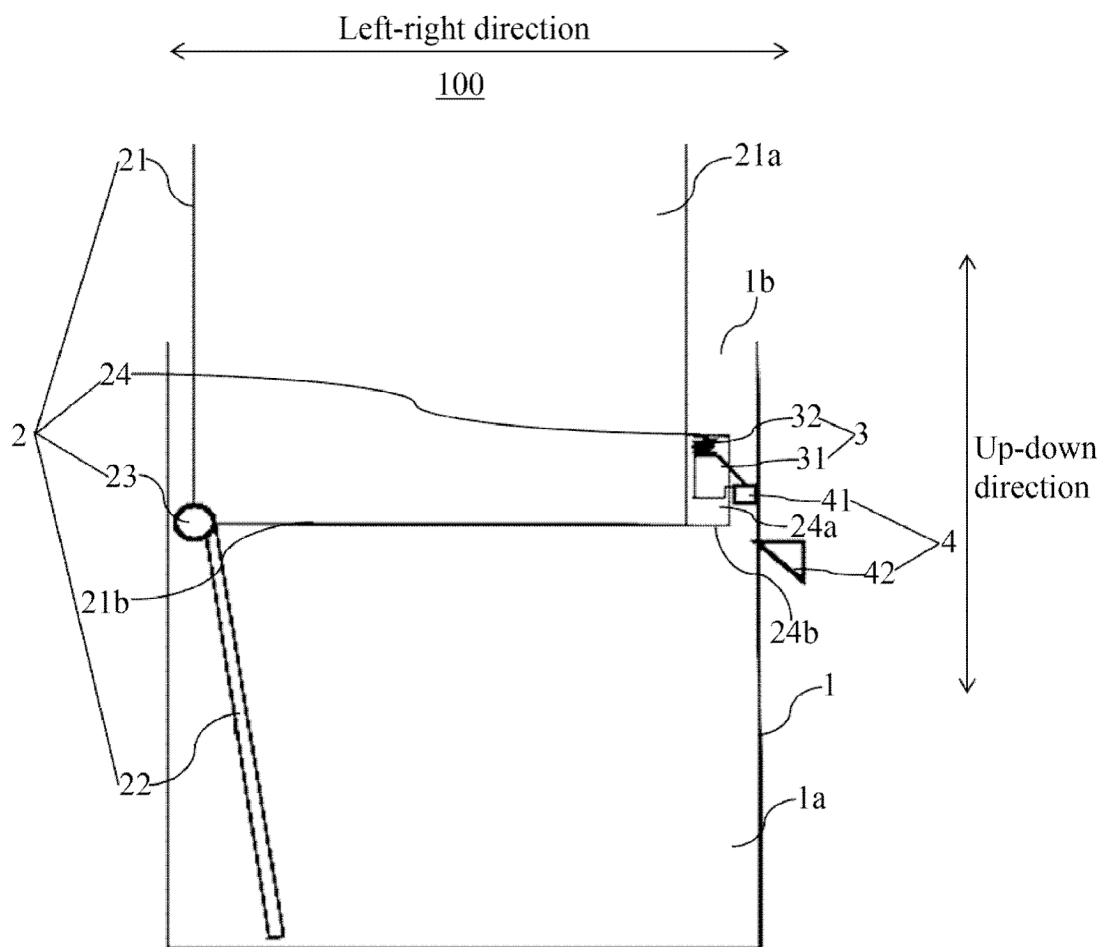


FIG. 2

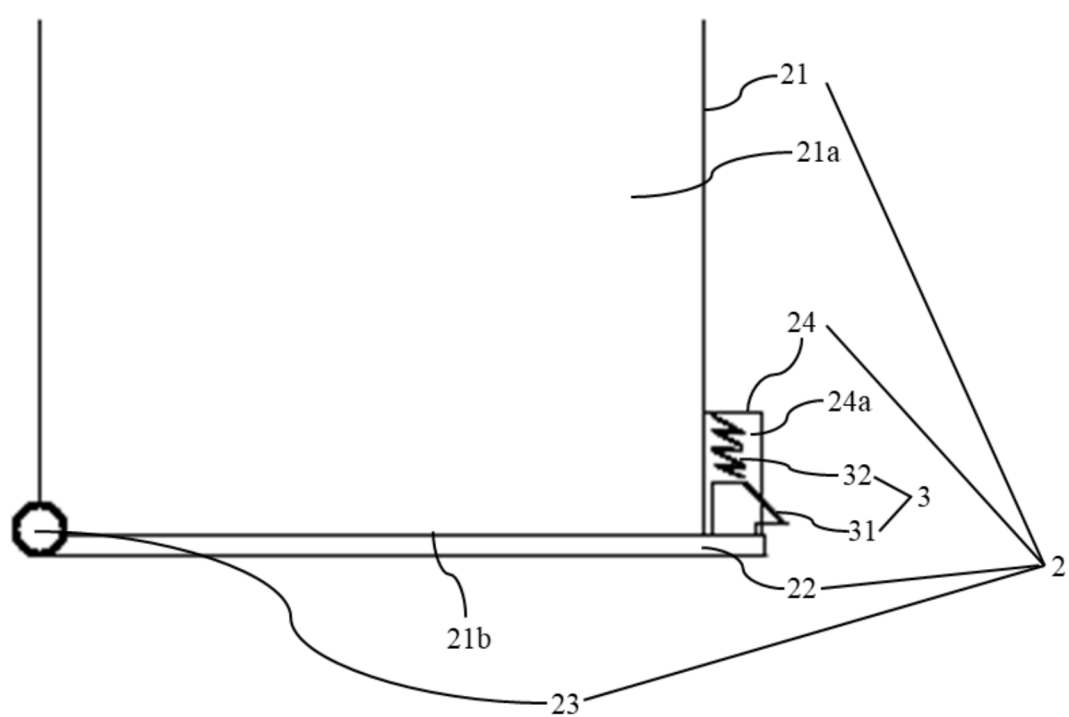


FIG. 3

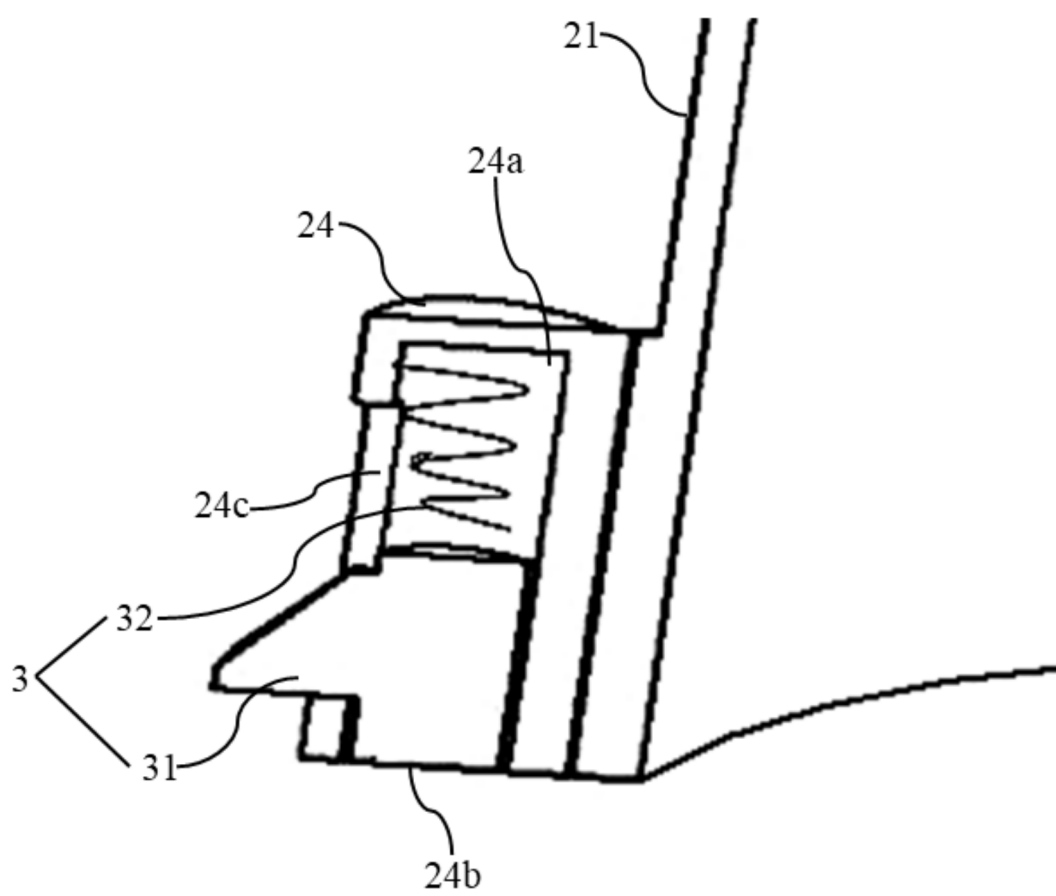


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/134001

A. CLASSIFICATION OF SUBJECT MATTER

A47L9/00(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC:A47L

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

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

CNABS, CNTXT, WPABS, ENTXT, ENTXTC, 百度, BAIDU: 吸尘, 集尘, 尘杯, 门, 盖, 锁, 开关, 关闭, 基站, 对接站, 集尘站, 服务站, 维护站, cover, door, lock+, clos+, station

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 218572109 U (TINECO INTELLIGENT TECHNOLOGY CO., LTD.) 07 March 2023 (2023-03-07) description, paragraphs 50-110, and figures 1-7	1-10
X	WO 202227384 A1 (DREAME INNOVATION TECHNOLOGY (SUZHOU) CO., LTD.) 03 November 2022 (2022-11-03) description, paragraphs 45-54, and figures 1-3	1-10
X	CN 211704442 U (JIANGSU MIDEA CLEANING APPLIANCES CO., LTD. et al.) 20 October 2020 (2020-10-20) description, paragraphs 47-83, and figures 1-6	1-10
A	US 2021235947 A1 (KINGCLEAN ELECTRIC CO., LTD.) 05 August 2021 (2021-08-05) entire document	1-10
A	CN 114795034 A (SUZHOU JIANDAN YOUWEI TECHNOLOGY CO., LTD.) 29 July 2022 (2022-07-29) entire document	1-10
A	US 2023157500 A1 (SAMSUNG ELECTRONICS CO., LTD.) 25 May 2023 (2023-05-25) entire document	1-10

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"D" document cited by the applicant in the international application	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 19 February 2024	Date of mailing of the international search report 15 March 2024
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/134001

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	218572109	U	07 March 2023	None			
WO	2022227384	A1	03 November 2022	CN	115245290	A1	28 October 2020
CN	211704442	U	20 October 2020	CN	113116215	A	16 July 2021
US	2021235947	A1	05 August 2021	WO	2020155702	A1	06 August 2020
				EP	3881744	A1	22 September 2021
				EP	3881744	A4	29 June 2022
				CN	109645881	A	19 April 2019
				CN	209712747	U	03 December 2019
CN	114795034	A	29 July 2022	CN	114795034	B	06 September 2022
US	2023157500	A1	25 May 2023	WO	2023090599	A1	25 May 2023
				KR	20230075269	A	31 May 2023

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202321813201 [0001]