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(54) **SOAP DISPENSER WITH MAGNETIC LOCKING MECHANISM**

(57) A soap dispenser (1) for dispensing soap comprising a wall-fixable base (9), a shell (2) hookable to the base (9) and a closing mechanism of the shell (2) for hooking and unhooking the shell (2) with respect to the base, said closing mechanism is characterized in that it comprises first hooking means fixed to the base (9) and second hooking means comprising at least one movable element configured to constrain the first hooking means with the second hooking means by hooking the shell (2) to the base (9) and to release, in the presence of a magnetic field, the same hooking means by releasing the shell (2) from the base (9).

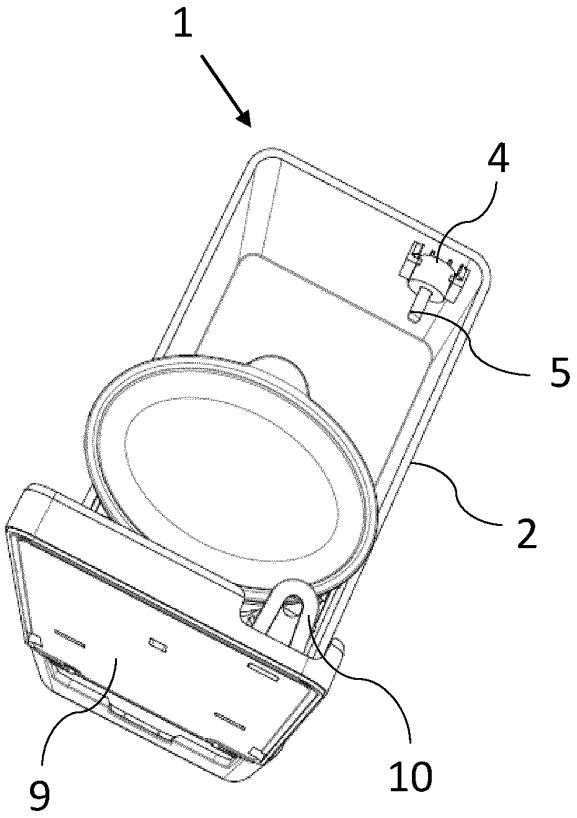

Fig. 3b

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Description

FIELD OF APPLICATION

[0001] The object of the present invention is a soap dispenser equipped with a magnetic locking mechanism.

Description of the prior art

[0002] The use of soap dispensers for hygiene in most of the public and non-public toilets in the area is well known in the prior art. These dispensers comprise external shells whose purpose is to cover the internal soap dispensing mechanism, as well as to make the dispenser itself more aesthetically pleasing.

[0003] These shells are closed and constrained to the dispenser base, the latter intended to be fixed to a wall, by means of a locking/unlocking system with a lock, just like that of a classic door of a house, in which it is necessary to insert an external physical key that can unlock the locking mechanism by means of a mechanical engagement to then allow the shell to open and thus refill the container with additional soap, correct any dispensing problems and/or replace internal structural elements.

[0004] According to WO 2023107635 A1, a dispenser comprising a magnetic closing system for an enclosure comprises a receiver arranged within the casing and a locking mechanism coupled to an inner surface of the casing. The closing mechanism comprises a plate coupled to the inner surface of the casing, a latch that can be rotated about an axis of rotation and configured to engage the plate in a locked orientation. The locking mechanism also comprises a torsion spring, coupled with a magnet, to exert a force on the latch to keep it in the locked orientation. The magnet is configured to interact with a magnetic key to overcome the force of the torsion spring and bring the latch into the unlocked position.

Problem of the prior art

[0005] In the prior art, it is particularly inconvenient to use a locking mechanism by means of mechanical interlocking through the insertion of an external physical key, as this procedure could lead to possible complications, such as the breaking of the key itself inside the lock; moreover, as there is a unique correspondence between the lock and the key, in the event of loss of the latter, it would not be possible to open the shell, except in the presence of a copy of said key. Finally, the locking mechanisms present in the prior art, given the presence of several structural components extending over the external portion of the shell, are cumbersome and sometimes very visible, contaminating and affecting the aesthetic side of the device, as, for example, in the case of the key hole.

[0006] In addition, in WO 2023107635 A1, closure by torsion spring return is guaranteed by the proper functioning of the torsion spring. In fact, in this dispenser, it is necessary for the torsion spring to be able to exert the necessary return force to allow the latch to engage with the plate. Therefore, in the event of malfunctioning or breakage of the spring, closure of the casing would not be permitted, implying the necessary and difficult replacement of the torsion spring itself.

SUMMARY OF THE INVENTION

[0007] The object of the present invention is to provide a soap dispenser characterized by a locking mechanism on the outer shell that overcomes the drawbacks of the prior art.

[0008] A further object of the above-mentioned invention is to present dispensers for dispensing liquid or powder soap characterized by an alternative outer shell locking mechanism to those presented in the prior art.

Advantages of the invention

[0009] Thanks to an embodiment, it is possible to obtain a dispenser for dispensing liquid or powder soap in which the locking mechanism needs no lock, and consequently no tool to be inserted inside. In particular, it is possible to obtain a dispenser for dispensing liquid or powder soap in which the locking mechanism comprises easily accessible components that allow for quick and simplified opening and closing of the shell with respect to known locking mechanisms.

[0010] Thanks to an embodiment, it is possible to obtain a dispenser for dispensing liquid or powder soap in which the locking mechanism involves the use of a magnetic key or an element capable of generating a magnetic field; consequently, even if the predefined key is lost, it is possible to unlock the shell through the use of alternative elements.

[0011] Thanks to a specific embodiment, it is possible to obtain a dispenser for dispensing liquid or powder soap in which the locking mechanism allows the use of only components placed inside the shell, thereby not affecting the aesthetics of the dispenser.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The characteristics and advantages of the present invention will become clear from the following detailed description of a possible practical embodiment, illustrated by way of a non-limiting example in the set of drawings, wherein:

- Figure 1 shows a dispenser according to the invention seen in its ordinary use configuration,
- Figure 2 shows various internal elements of the dispenser in Figure 1,
- Figure 3a presents the same elements as Figure 2, with the addition of a further support element, in which the magnetic locking mechanism of the dispenser in Figure 1 is in a closed configuration,

- Figure 3b presents the same elements as Figure 3a, with the addition of the shell, in which the magnetic locking mechanism of the dispenser in Figure 1 is in an open configuration,
- Figure 4 shows a dispenser from Figure 3b in an open configuration, highlighting the movement that can be implemented by the shell once it is unhooked.

DETAILED DESCRIPTION

[0013] The present invention relates to a dispenser 1, illustrated in Figure 1, for dispensing soap characterized by a magnetic locking and unlocking mechanism.

[0014] With reference to the appended figures, the dispenser 1 comprises a wall-fixable base 9 adapted to structurally support all the other elements of the dispenser 1 and a shell 2 which is movable with respect to the same base 9.

[0015] The outer shell 2, internally, provides a locking mechanism of the shell 2 itself with respect to the wall-fixable base 9. In the preferred embodiment of the invention, this locking mechanism is positioned in the side portion of the upper inner side of the shell 2.

[0016] In this case, this locking mechanism is most clearly observable from Figures 2 and 3a-b. It is characterized by first hooking means, fixed to the wall-fixable base 9 and second hooking means, fixed to the shell 2. The second hooking means comprise at least one movable element that can be constrained to the first hooking means to engage the shell 2 to the base 9, and that can be released from the first hooking means, in the presence of a magnetic field, to release the shell 2 from the base 9.

[0017] The first fixing means comprise a ring 10, preferably with a circular geometry, as shown in Figure 3, while the second ones comprise the presence of a sleeve 4 and at least one movable element, represented by a pin 5. This movable pin 5 can assume two different positions: the first position, in the locking step, and the second, in the unlocking step.

[0018] In the present invention, the locking mechanism has a single movable pin 5, but the possibility of integrating further movable elements to provide, for example, greater stability and security during the locking step is not limited.

[0019] The sleeve 4 has a passage channel into which the at least partially movable pin 5 is inserted, having the possibility to translate along the entire channel.

[0020] The first position, during the locking step, is guaranteed by inserting at least one movable pin 5 into the ring 10, thus engaging the shell 2 outside the base. If there is any need to open the shell 2, for example, to refill the funnel-shaped container 6, to replace a defective element or simply for a periodic check, the pin is simply moved out of the ring 10 in which it is inserted, thus unlocking the shell 2 from the base.

[0021] According to the present invention, the sleeve 4, the at least one movable pin 5 and the ring 10 are arranged along the same longitudinal axis, and oriented in space in such a way that the sleeve 4, and consequently also the movable pin 5, is positioned above the ring 10 (arrangement shown in Figure 3a). Thanks to this arrangement, due to the effect of gravity, the at least one movable pin 5 translates within the passage channel of the sleeve 4 until it engages in the ring 10 to hook the shell 2 to the base, thus defining the locking step. The unlocking step, on the other hand, takes place by disengaging at least one movable pin 5 from the same ring 10. Since the above-mentioned movable pin 5 is at least partly made of ferromagnetic material, such disengagement is only permitted in the presence of a magnetic field, so that the at least one movable pin 5 is attracted against gravity within the passage channel of the sleeve 4, in turn disengaging itself from the ring 10 in order to unhook the shell 2 from the base.

According to a preferred embodiment, the wall-fixable base 9 is determined by an almost "L"-shape, characterized by two substantially orthogonal portions constrained by a joining edge. The vertical portion is the part comprising the through holes for wall mounting. Through these holes, it is possible to fix the base 9 to the wall using specific screws and dowels, while the horizontal portion remains suspended in a cantilever fashion and allows the various soap dispensing components to be supported.

[0022] Once unhooked from the base 9, the shell 2 is free to make the opening movement, as shown in Figure 3b. In particular, the lower edge of the shell 2 is constrained to the joining edge of the two areas of the base 9 by at least one hinge mechanism 11 acting as a fulcrum, which allows the shell 2 to make a rotational movement along the sagittal plane of the dispenser 1.

[0023] Figure 4 shows the unlocking step, in which the shell 2 is unhooked from the base and can perform a rotation, being pivotally constrained to the base.

[0024] In order to enable the release operation, it is necessary to have an element adapted to generate a magnetic field, with a force of attraction such as to allow the movable pin 5 to move up along the channel of the sleeve 4, and thus unhook the shell 2 from the base 9. This element is represented by a portable magnetic key, provided together with the dispenser 1, configured to generate the magnetic field required to drive the at least one movable pin 5 up the sleeve 4.

By bringing the magnetic key close to the locking mechanism, this magnetic field causes the movable pin 5 to move from the first position (locking step) to the second position (unlocking step) according to the mechanism described above.

[0025] In the preferred embodiment of the invention, the above-mentioned shell 2 is made of plastic material to provide remarkable lightness and good impact resistance. In addition, again in the preferred embodiment of the invention, it is determined by a parallelepiped shape with an internal cavity such that all the necessary components for the liquid or powder soap dispensing system can be accommodated, as in the examples in the accompanying figures.

[0026] Preferably, the shell 2, in its closed configuration where it is hooked to the base 9, completely covers the dispensing system on all faces, except for the lower face where the soap powder comes out. The lower face is preferably partially covered. The rear face is also not closed as there is an interface with the base 9 for wall mounting. The shell 2 allows protection of the device itself, the components inside it, as well as providing a more customisable aesthetic feature than the dispenser 1 in the absence of the shell 2.

[0027] The shell 2, inside the cavity, covers a liquid or powder soap dispensing system.

[0028] The various components of the soap dispensing system preferably include a support platform 8, shown in Figure 2, which takes the same shape as the horizontal portion of the wall-fixable base 9, on which it rests. This orthogonal portion preferably has a channel, aligned with a corresponding passage in the shell 2 when the latter is hooked to the base 9, to allow the soap to flow out onto the user's hand.

[0029] Preferably, the dispensing system comprises a container 6 for refilling and storing the soap, visible in Figures 2, 3a-b and 4. Such a container 6, in the preferred embodiment of the invention, has a funnel shape and is particularly suitable for containing soap powder.

[0030] Preferably, the soap dispensing system comprises a dispensing mechanism 7, which, in the preferred embodiment of the invention, has a button to be pressed by a user for dispensing soap powder.

[0031] Advantageously, the present invention allows for a more uniform and continuous shell 2, i.e. without a special hole for inserting the key for opening the lock, as is the case in the prior art. It should be noted that if the dispenser 1 is configured to dispense soap powder, a hole at the top of the shell 2 for inserting a key would be critical as it could allow water droplets to pass through and reach the inside of the dispensing mechanism, making the powder to be dispensed during use form a paste, thus compromising operation and optimal dispensing.

[0032] The present invention also relates to a soap dispensing kit, comprising a dispenser 1 according to the invention and an unlocking key approachable to the shell 2 adapted to generate a magnetic field which, in correspondence of the closing mechanism, brings the at least one movable element from the first to the second position, according to the above description. Preferably, the unlocking key comprises a magnetic body, such as a magnet.

Claims

1. Dispenser (1) for dispensing soap, comprising:

- a wall-fixable base (9),
- a shell (2) hookable to the base,
- a closing mechanism for hooking and unhooking the shell (2) with respect to the base (9), the closing mechanism comprising first hooking means fixed to the base (9) and second hooking means fixed to the shell (2), the second hooking means comprising at least one movable element that can be attached to the first hooking means to hook the shell (2) to the base (9) and releasable from the first hooking means, in the presence of a magnetic field, to release the shell (2) from the base (9),

characterized in that

- the first fixing means comprise a ring (10) inside which at least one movable element can be inserted to hook the shell (2) to the base (9),
- the second hooking means comprise a sleeve (4) fixed to the shell (2) and at least one movable pin (5) at least partially inserted within the sleeve (4), wherein the sleeve (4), the at least one movable pin (5) and the ring (10) are aligned along the same longitudinal axis when the shell (2) is coupled to the base (9), the sleeve (4) being arranged above the ring (10) when the shell (2) is hooked to the base, in such a way that, due to the effect of gravity, the at least one movable pin (5) moves vertically along the sleeve (4) to be inserted into the ring (10) to hook the shell (2) to the base (9).

2. Dispenser (1) for dispensing soap according to claim 1, in which the movable element is configured to switch between a first position wherein it is constrained to the first hooking means for hooking the shell (2) to the base (9) and a second position wherein, in presence of a magnetic field, it is free from the first hooking means for unhooking the shell (2) from the base (9).

3. Dispenser (1) for dispensing soap according to claim 1 or 2, wherein,
in the presence of a magnetic field, the at least one movable pin (5) is attracted vertically against gravity inside the sleeve (4) to disengage from the ring (10) and release the shell (2) from the base (9).

4. Dispenser (1) for dispensing soap according to claim 1, 2 or 3 wherein the at least one movable pin (5) is at least partly made of ferromagnetic material.

5. Dispenser (1) for dispensing soap according to any one of the preceding claims wherein the base (9) comprises an upper edge and an opposite lower edge; the shell (2) comprises an upper portion and an opposite lower portion, wherein the lower portion of the shell (2) is rotatably constrained to the lower edge of the base (9).

6. Dispenser (1) for dispensing soap according to claim

5, comprising at least one hinge (11) constrained to the lower portion of the shell (2) and to the lower edge of the base (9) to rotatably constrain the shell (2) to the base (9).

7. Soap dispensing kit, comprising a dispenser (1) according to any of the preceding claims and an unlocking key approachable to the shell (2) suitable for generating a magnetic field which, in correspondence of the closing mechanism, brings the at least one movable element from the first to the second position.

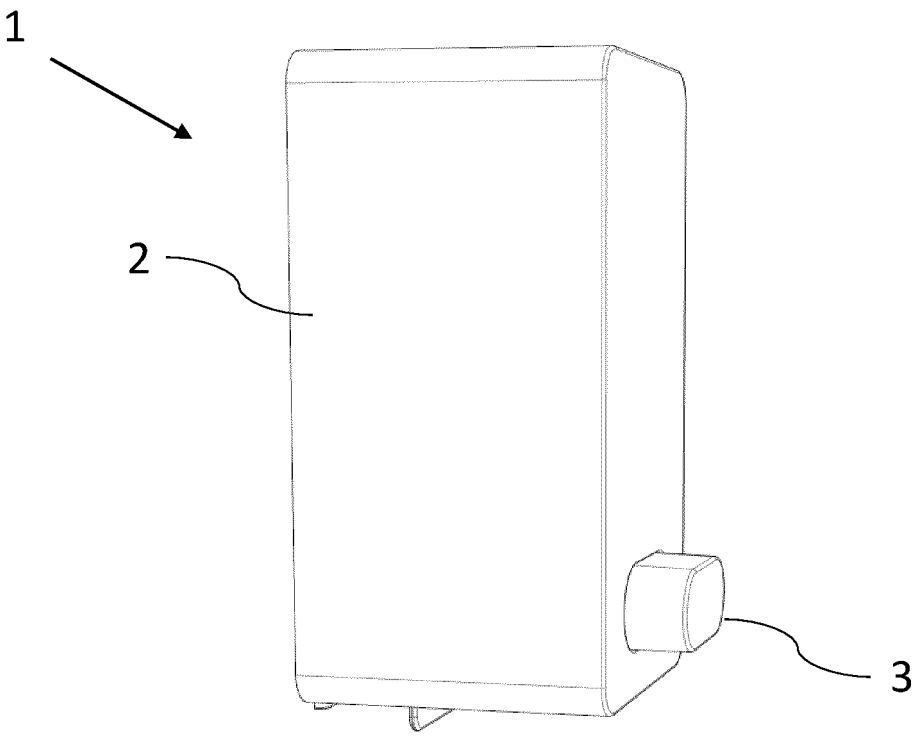

Fig. 1

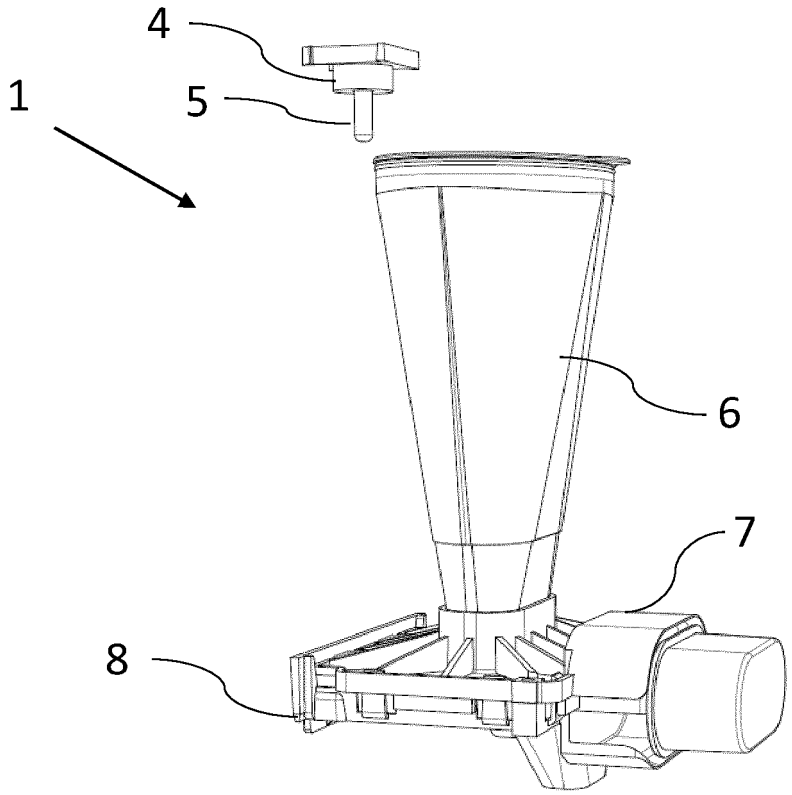

Fig. 2

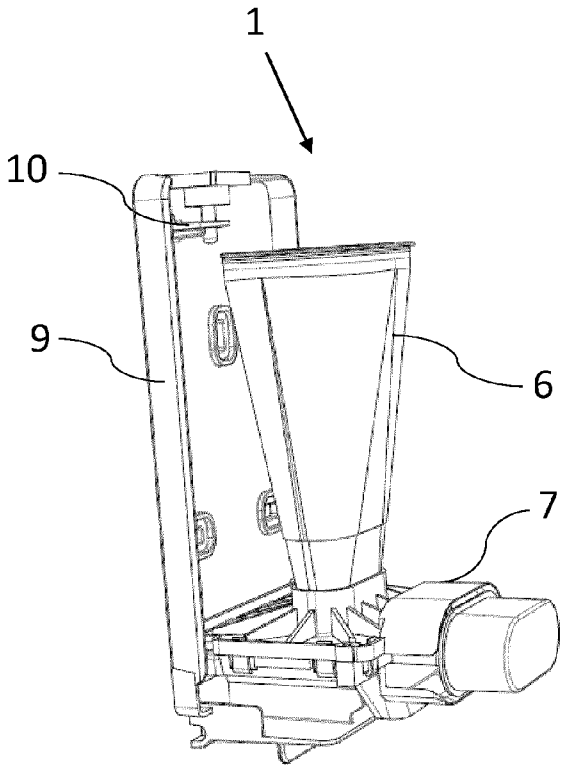

Fig. 3a

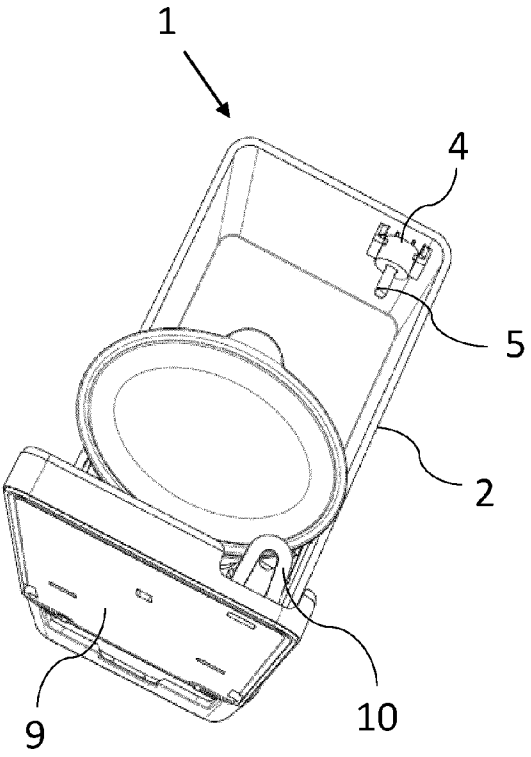

Fig. 3b

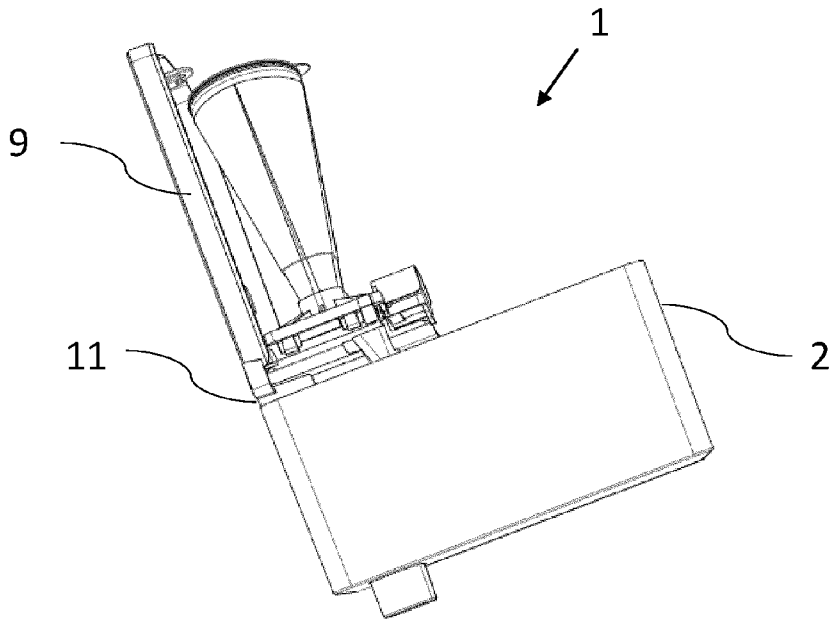

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 24 19 0652

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2023/107635 A1 (BRADLEY CORP [US]) 15 June 2023 (2023-06-15) * paragraph [0029] - paragraph [0078]; figures *	1-7	INV. A47K5/12 E05B47/00 E05B65/52
A	US 2022/018159 A1 (CUNEFARE KENNETH A [US] ET AL) 20 January 2022 (2022-01-20) * paragraph [0019] - paragraph [0054]; figures *	1-7	ADD. A47K10/32

TECHNICAL FIELDS SEARCHED (IPC)

A47K
E05B
E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 October 2024	Zuurveld, Gerben

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 19 0652

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