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(54) **DEVICE FOR DISPENSING GRANULAR PRODUCTS**

SPENDEVORRICHTUNG FÜR GRANULATFÖRMIGE PRODUKTE

DISTRIBUTEUR DE PRODUITS GRANULAIRES

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Description

[0001] The invention relates to a device for dispensing grain-like products of the type as stated in the preamble of claim 1.

[0002] Dispensers for successive release of tablet-like or pill-like products, such as for instance sweets, sweeteners, medication, lozenges and so on are already known. Examples of known dispensers are described in the patent applications WO2006/116370, CH661491, and FR 258 232. The dispenser described in this patent publication comprises a housing incorporating a supply container for products in tablet form. The supply container comprises a separate resilient bottom element which connects to the dispensing channel for the products in tablet form. The dispensing channel is provided with a dispensing opening on an outer end remote from the supply container. Because the dispensing channel tapers in the direction of the dispensing opening, wherein the dimensioning of the dispensing channel is such that the tablets can only be transported successively through the dispensing channel, it is possible to bring about successive dispensing of the tablets. Dispensing of the tablets takes place by pressing an upper wall of the supply container relative to the enclosing housing, whereby the bottom element, and thereby the dispensing channel, can be deformed such that the dispensing opening is formed and a single tablet can be dispensed. A drawback of the known dispenser is that only tablet products of the same shape can be successively dispensed. It has been found that products of differing shape, such as for instance coarse grains of sugar, in particular sprinkling sugar or lumps of sugar candy, are not suitable for orderly transport in the direction of the dispensing opening. If products of differing shape were to be arranged in the supply container, a reliable dispensing of these products is then generally not possible because the products of differing shape are usually jumbled together, which prevents or at least considerably impedes dosed dispensing of the products by the dispenser.

[0003] German patent publication DE 2925432 discloses a dispenser according to the preamble of claim 1, wherein individual grain-like products can be dispensed, comprising a container a supply container for granular products, which supply container is provided with a bottom element for supporting the granular products, a dosing compartment adapted to receive a grain, which dosing compartment is provided with at least one dispensing opening for dispensing the grain, wherein the relative orientation between the bottom element and the dosing compartment can be changed between an active position, in which the bottom element connects to the dosing compartment such that displacement to the dosing compartment of a grain supported by the bottom element is possible, and a non-active position in which the bottom element is located at a distance from the dosing compartment such that displacement of one or more grains supported by the bottom element is not possible. A prob-

lem of this type of dispenser is that the grains to be dispensed are in contact with the external environment which is undesired.

[0004] The invention has for its object to provide an improved dispenser, using which grain-like products of differing shape can be dispensed in an improved dosed manner.

[0005] The invention provides for this purpose a device of the type stated in the preamble, characterized in that the dosing compartment is provided with at least one dosing element for supporting the at least one grain and in that in the active position the first closing element is in the closed position. By accommodating the dosing compartment, in particular the dosing element, and the bottom element in mutually displaceable manner, in particular slidable manner, in the device according to the invention as specified above a dosed dispensing of grain-like products of differing shape can be realized and guaranteed. By first positioning a grain-like product on the dosing element in the active position in the dosing compartment and then displacing the bottom element in a direction away from the dosing element, the grain-like product can be isolated from other products present in the supply container. Obstruction of the dosing compartment, functioning in fact as dispensing channel, can be prevented in that the at least one grain-like product situated in the dosing compartment is first isolated from other grain-like products carried by the bottom element, whereby bridging between products or other jumbling together of a product situated in the dosing compartment and an adjacent product carried by the bottom element can be prevented, or at least optionally reversed. After isolating of the grain-like product, the product can then be dispensed by the device. The dosing compartment can be designed in various ways and can be adapted for multi-lateral enclosure of a grain-like product. It is however also possible to envisage the dosing compartment comprising only the dosing element. The bottom element of the supply container will in general substantially connect to the dosing element of the dosing compartment in the active position of the device, although it is possible to envisage some distance between the two, on condition that it is made possible for the grains to move from the bottom element to the dosing element in the active position, after which the separation of the bottom element and the dosing element can be realized. As a result of the mutual displacement of the bottom element relative to the dosing compartment, the dosing compartment in fact functions as a dosing scoop for the purpose of isolating one or more grains which can be dispensed via the dispensing opening. Owing to the mutual displacement of the bottom element relative to the dosing element, no additional separating elements, such as for instance a separating finger, are required for the purpose of separating a dosed quantity of grains in the dosing compartment, which makes the construction of the device according to the invention particularly efficient.

[0006] In order to enable a controlled dispensing of

products, the device comprises at least one first closing element for closing the dispensing opening, which first closing element is displaceable between an opened position, in which the dispensing opening is left substantially clear, and a closed position in which the dispensing opening is substantially blocked, wherein the first closing element is positioned in the closed position in the active position of the device. In this manner it is possible to prevent a plurality of products being (simultaneously) dispensed in unwanted manner by the device in the active position of the device. In a particular preferred embodiment the first closing element is coupled to the bottom element such that the first closing element is oriented in the closed position in the case the bottom element is oriented in the active position. By coupling the closing element to the bottom element a synchronous movement of the two components, and thereby simultaneously reaching the active position and the closed position (and vice versa), can be ensured in relatively simple manner. Depending on the size of the dosing compartment, the dosing compartment can be adapted to (simultaneously) receive one grain-like product or a plurality of grain-like products. The grain-like products can herein be coarse-grained. It is however also possible to envisage dispensing fine-grained products and even products in powder form using the device according to the invention. The device according to the invention is suitable for dosed dispensing of products of substantially the same shape as well as products of differing shape. Examples of products of substantially the same shape are sweets, sweeteners, medication (in pill form), lozenges, bath pearls and so on. Examples of products of substantially differing shape are coarse grains of sugar, coarse grains of (sea) salt, sweets and so on. It is noted that the dimensioning of the grain-like products must preferably be such here that the products are adapted to enable dosed distribution using the device according to the invention. In the context of this patent publication, granular products are deemed identical to grain-like products, and grains are deemed identical to product grains of the at least one granular product.

[0007] The first closing element is preferably coupled to the bottom element such that the first closing element is oriented in the opened position in the case the bottom element is oriented in the non-active position, whereby a dosed distribution of at least one product arranged isolated in the dosing compartment can take place. In a preferred embodiment the device comprises operating means coupled to the first closing element for operating the first closing element between the opened position and the closed position. The operating means can for instance be formed by an upper wall or top element of the supply container. It is however also possible to envisage applying other types of operating means. It will generally be of importance however that at least a part of the operating means is positioned in accessible manner so as to facilitate operation by a user.

[0008] In a preferred embodiment, during the displace-

ment from the active position to the non-active position, the bottom element and the dosing compartment are mutually displaceable over a distance corresponding to at least three times, preferably at least five times, the average diameter of the granular products received in the device. Making the displacement of the bottom element relative to the dosing compartment sufficiently large can ensure a relatively accurate dosing of one or more grains in the dosing compartment and a subsequent dosed dispensing of these grains via the dispensing opening, wherein the risk of grains supported by the bottom element in the non-active position being displaced to the dosing compartment can be prevented or at least be minimized.

[0009] It is also particularly advantageous that the shortest distance between the bottom element, at the position of the dosing compartment in the active position of the device, and an upper wall of the supply container opposite the bottom element corresponds to at least four times the average diameter of the granular products received in the device. By maintaining sufficient distance between the bottom element and the upper wall a substantially unimpeded displacement of grains from the bottom element in the direction of the dosing compartment can be ensured, wherein the chance of grains carried by the bottom element becoming jumbled together and consequently blocking each other can be prevented as far as possible. This preferred embodiment is particularly advantageous when grain-like products of differing shape are or will be received in the device according to the invention. It is further also advantageous when the shortest distance between the dosing element, in the active position of the device, and a bounding element situated above the dosing element corresponds to at least four times the average diameter of the granular products received in the device. The bounding element will generally be formed by an upper wall of the dosing compartment. By keeping the distance between the dosing element and the (first) overlying bounding element sufficiently great a substantially free (unimpeded) displacement of the grain-like products from the bottom element to the dosing compartment can be ensured as far as possible in the active position of the device, wherein the risk that the bounding element will function as an obstacle to the above stated desired substantially free displacement of the grains can be prevented as far as possible. In order to minimize to further extent the formation of obstacles in the active position, there is preferably no intermediate bounding element situated between the dosing element and an upper wall of the dosing compartment situated above the dosing element.

[0010] To enable a change in the orientation of the bottom element and the dosing compartment the bottom element and the dosing compartment are formed by mutually separate components, wherein the bottom element is not integrally connected to the dosing compartment. It is however possible to envisage a mutual mechanical coupling between the bottom element and the dosing

compartment. The bottom element and the dosing compartment are preferably mutually slidable, in particular according to a predefined path. The path can take both a linear form and a non-linear form, such for instance curved or angular. The predefined path can be realized by applying guide means along which the bottom element and/or the dosing compartment are displaceable, in particular slidable.

[0011] The dosing compartment preferably forms part of a housing at least partially enclosing the bottom element. In this manner a relatively strong device can be obtained, wherein the bottom element is accommodated at least partially in the housing. At least the dosing element of the dosing compartment is preferably connected in stationary (fixed) manner to the housing, and at least the bottom element of the supply container is accommodated displaceably in the housing. In a preferred embodiment a part of the supply container forms part of the housing. It is possible here to envisage that side walls forming part of the supply container for instance form an integral part of the housing. In an alternative embodiment the supply container is accommodated displaceably in the housing as a separate component. The dosing compartment preferably becomes bounded multilaterally by the housing permanently, so in both the active position and in the non-active position. The side walls serve to stabilize the at least one grain received in the dosing compartment, whereby undesired return (dropping back) of the grain from the dosing compartment to the supply container can be prevented as far as possible.

[0012] The supply container will generally be manufactured from one or more substantially rigid materials, preferably a polymer or metal. The distance between (opposite) walls bounding the supply container will moreover generally also be substantially constant, whereby the supply container will have a substantially constant volume during normal use.

[0013] In order to enable a relatively simple displacement of products from the supply container to the dosing compartment, it is advantageous if the bottom element and a horizontal surface enclose a mutual angle in at least the active position of the device. The inclining orientation of the bottom element will generally be permanent and, although conceivable, will generally not depend on the position of the bottom element. In order to be able to bring about a reliable displacement of grain-like products from the supply container to the dosing compartment, the bottom element and a horizontal surface enclose a mutual angle which is greater than or equal to 5° . At such an angle of inclination products will tend to slide in the direction of the dosing compartment under the influence of the force of gravity, which facilitates the dosed dispensing of products by the device. In another preferred embodiment the dosing element and a horizontal surface enclose a mutual angle at least in the non-active position of the bottom element. Dispensing of the grain received in the dosing compartment can be facilitated by having the dosing element enclose an angle with a hor-

izontal surface. The dosing element herein tapers in a direction away from the bottom element. It is particularly advantageous here when the bottom element and a horizontal surface enclose a mutual angle greater than 5° , preferably greater than 10° .

[0014] The dosing compartment is preferably positioned in the device such that grains present in the dosing compartment can leave the device by falling via the dispensing opening and after displacement of the first closing element to the opened position. Allowing a dosed quantity of grains to drop out of the device is generally exceptionally practical since in this way the grain can be removed from the device with one hand and in a single hand movement. Furthermore, the granule need in this way not be removed from the device by hand, which is also particularly advantageous from a hygienic viewpoint.

[0015] In a preferred embodiment the device comprises a second closing element for blocking a passage from the supply container to the dosing compartment in the non-active position of the bottom element. Applying the second closing element can prevent an already isolated grain-like product (or a plurality of simultaneously isolated products) being able to move back to the supply container or being able to leave the dosing compartment in other inappropriate manner than via the dispensing opening. The second closing element will be arranged displaceably in the device in order to nevertheless enable transport of one or more grain-like products from the supply container to the dosing compartment in the active position of the bottom element. For this purpose the second closing element is preferably coupled to an upper wall of the supply container. During displacement of the upper wall, and thereby the lower wall generally coupled to the upper wall, between the active position and the non-active position the second closing element can be co-displaced correspondingly so as to respectively enable leaving clear and blocking of the passage. The dosing compartment will usually be defined by the dosing element, two side walls forming part of the housing, the first closing element (in the active position of the device), and - if applied - the second closing element (in the non-active position of the device).

[0016] The device preferably comprises biasing means for urging the bottom element to a determined starting position. The bottom element can only be displaced to another position when a (greater) bias is applied to the biasing means. In the rest position the bottom element is preferably urged into the active position by the biasing means, whereby the dosing compartment can be filled with a product initially held in the supply container, whereby the dispensing of the product can be accelerated for a user. In another embodiment it is however also possible to envisage the bottom element in the rest position being urged into the non-active position by the biasing means so as to enable the longest possible conservation of the products in the supply container during non-use of the device, which can be advantageous from

a hygiene viewpoint. The biasing means preferably comprise at least one spring, in particular a compression spring or a resilient tongue.

[0017] The device will usually comprise only a single dosing compartment. In an alternative preferred embodiment however, the device comprises a plurality of dosing compartments. In this way simultaneous, successive and/or selective dispensing of products can be facilitated. The dosing compartments can for instance here be oriented around the supply container in a carousel configuration. In a particular preferred embodiment it is also possible to envisage the device comprising a plurality of supply containers, wherein each supply container is adapted to be connected to a (separate) dosing compartment.

[0018] The device according to the invention is intended to be held in the hand. It is also possible to envisage the device being adapted to be stationed on a table or other surface, whereby the device according to the invention can be embodied as a hand-held device or as a table-top device.

[0019] The invention will be elucidated on the basis of non-limitative exemplary embodiments shown in the following figures. Herein:

figures 1a-1e show different perspective views of a first preferred embodiment of a device according to the invention,

figures 2a-2h show different perspective views of a second preferred embodiment of a device according to the invention,

figures 3a and 3b show different perspective views of a third preferred embodiment of a device according to the invention, and

figures 4a and 4b show different views of a fourth preferred embodiment of a device according to the invention.

[0020] Figure 1a shows a perspective view of a first preferred embodiment of a device 1 according to the invention. Device 1 is adapted for dosed dispensing of individual products 2, in particular grain-like products. Device 1 comprises for this purpose a housing 3 and a supply container 4 for the grain-like products accommodated partially in housing 3. Supply container 4 is received slidably in housing 3, wherein supply container 4 is specifically displaceable between a (rest) position (see figures 1a and 1b) and an active position (see figures 1c and 1d). In order to be able to facilitate displacement of supply container 4 for a user, housing 3 is provided with recesses 5a, 5b. In the cross-section shown in figure 1b it can be seen that supply container 4 comprises a bottom element 6 and an upper wall 7. The shortest distance between bottom element 6 and upper wall 7 amounts in this embodiment to about six times the average diameter of grains 2, whereby grains 2 can displace substantially free and unimpeded in supply container 4. Bottom element 6 is adapted to carry products 2, which may or may

not be of uniform shape. Housing 3 comprises a separating wall 8 bounding supply container 4, which separating wall 8 functions as guide for supply container 4 during the displacement of supply container 4 between the passive position and the active position. Separating wall 8 takes an interrupted form and is provided at the position of the interruption with a dosing compartment 9 which is adapted to receive one grain-like product 2. As shown in figure 1b, supply container 4 is urged into the uppermost position (rest position) by the presence of a compression spring 10, which engages on housing 3 on one side and engages on bottom element 6 on the other. Bottom element 6 has an inclining orientation, whereby products 2 tend to be displaced in the direction of dosing compartment 9. In the shown situation dosing compartment 9 is closed by a closing element 11, which closing element 11 is connected to at least bottom element 6. In the shown rest position at least one product 2 will be displaced from supply container 4 to dosing compartment 9. By pressing supply container 4 relative to housing 3 (see figures 1c, 1d and 1e) the product received in dosing compartment 9 will be isolated from the other products present in supply container 4. The relative displacement of bottom element 6 relative to dosing compartment 9 is sufficiently large here, and in the present exemplary embodiment is about six times the average diameter of grains 2, whereby sufficient separation can be ensured between the grains 2 situated in dosing compartment 9 and the other grains 2 still situated in supply container 4. Because upper wall 7 of supply container 4 is provided with a partition 12 it is possible to prevent the product isolated in dosing compartment 9 moving back into supply container 4. During the displacement of supply container 4 in downward direction closing element 11 will also be displaced in downward direction, such that the product received in dosing compartment 9 can leave dosing compartment 9 and can thereby be dispensed by device 1. In order to be able to facilitate this dispensing the dosing compartment 9 also comprises an inclining bottom element 13. The shortest distance between inclining bottom element 13, also referred to as dosing element, and upper wall 7 amounts to about seven times the average diameter of grains 2, whereby upper wall 7 will not form an obstacle during displacement of grains 2 from supply container 4 to dosing compartment 9.

[0021] Figures 2a-2h show different perspective views of a second preferred embodiment of a device 14 according to the invention. Device 14 comprises a housing 15 in which grain-like products 16 are received. The housing comprises a base structure 17 and a top structure 18 co-acting with base structure 17. Top structure 18 is urged in a direction away from base structure 17 by a compression spring 19. Base structure 17 is provided with a conically shaped bottom element 20 adapted to support products 16. Top structure 18 is provided with a plurality of dosing compartments 21 which are distributed substantially uniformly over the peripheral side of top structure 18. By pressing top structure 18 in the direction of

base structure 17 counter to the spring tension (see figures 2c and 2d) dosing compartments 21 will be filled with at least one product 16. By then (partly) relieving the pressure on top structure 18, top structure 18 will once again be oriented in the starting position (see figures 2e and 2f). In this situation dosing compartments 21 are still filled with products 16. Dosing compartments 21 can be opened by then axially rotating top structure 18 (see figures 2g and 2h), after which dispensing of products 16 received in dosing compartments 21 is possible.

[0022] Figures 3a and 3b show different perspective views of a third preferred embodiment of a device 22 according to the invention. Device 22 comprises a base structure 23 and a top structure 24 pivotally connected to base structure 23. The top structure is provided with a supply container 25 for granular products 26. Supply container 25 is provided with a receiving space 27 for a wall part 28 of base structure 23. An upper side of this wall part 28 forms a bottom element 29 of a dosing compartment 30 for receiving a product 26. Supply container 25 is provided with a passage opening 31 for products 26. In an uppermost position of top structure 24 at least one product will be positioned in dosing compartment 30. By then pivoting top structure 24 in downward direction the product 26 present in dosing compartment 30 will be isolated from other products 26 still present in supply container 25. In this isolated position of product 26 the passage opening 31 of top structure 24 can be placed in line with dosing compartment 30, after which dispensing of the isolated product 26 can take place (see figure 3b).

[0023] Figures 4a and 4b show different views of a fourth preferred embodiment of a device 32 according to the invention. Figure 4a shows a perspective view of a device 32, wherein the device comprises a base structure 33 and a top structure 34. Top structure 34 is partially accommodated in base structure 33. Top structure 34 can be displaced along a helical path relative to base structure 33 (see figure 4c). In the cross-section shown in figure 4b it can be seen that grain-like products 36 are arranged in a supply space 35 enclosed by the top structure. Products 36 are herein supported by a bottom element 37 forming part of base structure 33. The top structure is provided with a laterally positioned dosing compartment 38 in which at least one product can be arranged. In the shown (lowermost) position of top structure 34 at least one product 36 will be displaced into dosing compartment 38. Dispensing of product 36 from device 32 is prevented in this position in that base structure 33 covers dosing compartment 38. By then rotating top structure 34 relative to base structure 33 (see figure 4c) the relevant product 36 can be isolated and dosing compartment 38 will no longer be covered, whereby product 36 can be dispensed (see figure 4d).

[0024] It will be apparent that the invention is not limited to the exemplary embodiments shown and described here, but that within the scope of the appended claims numerous variants are possible which will be self-evident to the skilled person in the field.

Claims

1. Device (1) for dispensing granular products (2), comprising:

- at least one supply container (4) for granular products, which supply container is provided with a bottom element (6) for supporting the granular products,
- at least one dosing compartment (9) adapted to receive at least one grain, which dosing compartment is provided with at least one dispensing opening for dispensing the at least one grain, and
- at least one first closing element (11) for closing the dispensing opening, which first closing element is displaceable between an opened position, in which the dispensing opening is left substantially clear, and a closed position in which the dispensing opening is substantially blocked,

wherein the relative orientation between the bottom element and the dosing compartment can be changed between an active position, in which the bottom element connects to the dosing compartment such that displacement to the dosing compartment of at least one grain supported by the bottom element is possible, and a non-active position in which the bottom element is located at a distance from the dosing compartment such that displacement of one or more grains supported by the bottom element is not possible,

characterized in that the dosing compartment is provided with at least one dosing element (13) for supporting the at least one grain, and **in that** in the active position the first closing element is in the closed position.

2. Device as claimed in claim 1, **characterized in that** the first closing element (11) is coupled to the bottom element such that the first closing element is oriented in the closed position in the case the bottom element is oriented in the active position.
3. Device as claimed in claim 1 or 2, **characterized in that** the first closing element (11) is coupled to the bottom element such that the first closing element is oriented in the opened position in the case the bottom element is oriented in the non-active position.
4. Device as claimed in any of the foregoing claims, **characterized in that** the device comprises operating means coupled to the first closing element for operating the first closing element between the opened position and the closed position.
5. Device as claimed in any of the foregoing claims, **characterized in that** during the displacement from

the active position to the non-active position, the bottom element and the dosing compartment are mutually displaceable over a distance corresponding to at least three times, preferably at least five times, the average diameter of the granular products received in the device.

6. Device as claimed in any of the foregoing claims, **characterized in that** the shortest distance between the bottom element, at the position of the dosing compartment in the active position of the device, and an upper wall (7) of the supply container opposite the bottom element corresponds to at least four times the average diameter of the granular products received in the device. 5
7. Device as claimed in any of the foregoing claims, **characterized in that** the shortest distance between the dosing element, in the active position of the device, and a bounding element situated above the dosing element corresponds to at least four times the average diameter of the granular products received in the device. 10
8. Device as claimed in any of the foregoing claims, **characterized in that** the dosing compartment forms part of a housing (3) at least partially enclosing the bottom element. 20
9. Device as claimed in any of the foregoing claims, **characterized in that** the bottom element and the dosing compartment are mutually displaceable according to a substantially linear path. 25
10. Device as claimed in any of the foregoing claims, **characterized in that** the bottom element and a horizontal surface enclose a mutual angle in at least the active position of the bottom element. 30
11. Device as claimed in any of the foregoing claims, **characterized in that** the dosing element and a horizontal surface enclose a mutual angle at least in the non-active position of the bottom element. 35
12. Device as claimed in any of the foregoing claims, **characterized in that** the dosing compartment is positioned in the device such that grains present in the dosing compartment can leave the device by falling via the dispensing opening and after displacement of the first closing element to the opened position. 40
13. Device as claimed in any of the foregoing claims, **characterized in that** the device comprises a second closing element (12) for blocking a passage from the supply container to the dosing compartment in the non-active position of the bottom element. 45

14. Device as claimed in any of the foregoing claims, **characterized in that** the device comprises biasing means (10, 19) for urging the bottom element to the active position.

15. Device as claimed in any of the foregoing claims, **characterized in that** the device comprises a plurality of dosing compartments.

Patentansprüche

1. Spendevorrichtung (1) zur Ausgabe von granulatformigen Produkten (2), die umfasst:

- mindestens einen Vorratsbehälter (4) für granulatformige Produkte, welcher Vorratsbehälter mit einem Bodenelement (6) für die Aufnahme der granulatformigen Produkte versehen ist,
- mindestens eine Dosierkammer (9), die angepasst ist, mindestens ein Korn aufzunehmen, welche Dosierkammer mit mindestens einer Ausgabeöffnung für die Ausgabe des mindestens einen Korns vorgesehen ist, und
- mindestens ein erstes Verschlusselement (11) zum Verschließen der Ausgabeöffnung, welches erste Verschlusselement verschiebbar ist zwischen einer geöffneten Position, in der die Ausgabeöffnung im Wesentlichen freigelassen wird, und einer geschlossenen Position, in der die Ausgabeöffnung im Wesentlichen blockiert ist, worin die relative Ausrichtung zwischen dem Bodenelement und der Dosierkammer verändert werden kann, zwischen einer aktiven Position, in der das Bodenelement auf eine Weise mit der Dosierkammer verbunden ist, dass die Verschiebung zur Dosierkammer von mindestens einem Korn, das von dem Bodenelement getragen wird, ermöglicht wird, und einer nicht-aktiven Position, in der sich das Bodenelement in einem Abstand von der Dosierkammer befindet, sodass Verschiebung von einem oder mehreren Körnern, die von dem Bodenelement getragen werden, verhindert wird,

dadurch gekennzeichnet, dass die Dosierkammer mit mindestens einem Dosierelement (13) zur Aufnahme des mindestens einen Korns versehen ist und dass in der aktiven Position das erste Verschlusselement sich in der geschlossenen Position befindet.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das erste Verschlusselement (11) mit dem Bodenelement gekoppelt ist, sodass das erste Verschlusselement in der geschlossenen Position ausgerichtet ist in dem Fall, indem das Bodenelement in der aktiven Position ausgerichtet ist.

3. Vorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das erste Verschlusselement (11) mit dem Bodenelement gekoppelt ist, sodass das erste Verschlusselement in der geöffneten Position ausgerichtet ist in dem Fall, indem das Bodenelement in der nicht-aktiven Position ausgerichtet ist. 5
4. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung Bedienungsmittel umfasst, die mit dem ersten Verschlusselement gekoppelt sind für die Bedienung des ersten Verschlusselements zwischen der geöffneten Position und der geschlossenen Position. 10
5. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** während der Verschiebung aus der aktiven Position in die nichtaktive Position das Bodenelement und die Dosierkammer über einen Abstand gegeneinander verschiebbar sind, der mindestens dem dreifachen, vorzugsweise mindestens dem fünffachen Wert des durchschnittlichen Durchmessers der in der Vorrichtung aufgenommenen granulatformigen Produkte entspricht. 15 20 25
6. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der kürzeste Abstand zwischen dem Bodenelement in der Position der Dosierkammer in der aktiven Position der Vorrichtung und einer oberen Wand (7) des Vorratsbehälters gegenüber dem Bodenelement mindestens dem vierfachen Wert des durchschnittlichen Durchmessers der in der Vorrichtung aufgenommenen granulatformigen Produkte entspricht. 30 35
7. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der kürzeste Abstand zwischen dem Dosierelement in der aktiven Position der Vorrichtung und einem Begrenzungselement, das sich oberhalb des Dosierelements befindet, mindestens dem vierfachen Wert des durchschnittlichen Durchmessers der in der Vorrichtung aufgenommenen granulatformigen Produkte entspricht. 40 45
8. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Dosierkammer Teil eines Gehäuses (3) bildet, das zumindest teilweise das Bodenelement umschließt. 50
9. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Bodenelement und die Dosierkammer entsprechend einem im Wesentlichen linearen Pfad gegeneinander verschiebbar sind. 55
10. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Bodenelement und eine horizontale Fläche zumindest in der aktiven Position des Bodenelements einen gemeinsamen Winkel bilden.
11. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Dosierelement und eine horizontale Fläche zumindest in der nicht-aktiven Position des Bodenelements einen gemeinsamen Winkel bilden.
12. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Dosierkammer in der Vorrichtung so positioniert ist, dass in der Dosierkammer anwesende Körner die Vorrichtung durch Herausfallen aus der Ausgabeöffnung verlassen können, und nach Verschiebung des ersten Verschlusselements in die geöffnete Position.
13. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung ein zweites Verschlusselement (12) zum Blockieren eines Durchgangs vom Vorratsbehälter zur Dosierkammer in der nicht-aktiven Position des Bodenelements umfasst.
14. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung Vorspannmittel (10, 19) zum Drängen des Bodenelements in die aktive Position umfasst.
15. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung eine Vielzahl Dosierkammern umfasst.

Revendications

1. Dispositif (1) pour distribuer des produits en grains (2), comprenant :
- au moins un récipient d'alimentation (4) pour produits en grains, lequel récipient d'alimentation est pourvu d'un élément formant fond (6) pour supporter les produits en grains ;
 - au moins un compartiment de dosage (9) adapté pour recevoir au moins un grain, lequel compartiment de dosage est pourvu d'au moins un orifice de distribution pour distribuer le au moins un grain, et
 - au moins un premier élément obturateur (11) pour obturer l'orifice de distribution, lequel premier élément obturateur est déplaçable entre une position ouverte dans laquelle l'orifice de distribution est laissé sensiblement dégagé, et une position fermée dans laquelle l'orifice de distribution est sensiblement bloqué,

étant entendu que l'orientation relative entre l'élément formant fond et le compartiment de dosage peut être basculée entre une position active dans laquelle l'élément formant fond se raccorde au compartiment de dosage de telle sorte que le déplacement, jusqu'au compartiment de dosage, d'au moins un grain supporté par l'élément formant fond est possible, et une position non active dans laquelle l'élément formant fond est situé à une certaine distance du compartiment de dosage de telle sorte que le déplacement d'un ou de plusieurs grains supportés par l'élément formant fond n'est pas possible,

caractérisé en ce que le compartiment de dosage est pourvu d'au moins un élément de dosage (5b) pour supporter le au moins un grain et **en ce que**, dans la position active, le premier élément obturateur est dans la position fermée.

2. Dispositif selon la revendication 1, **caractérisé en ce que** le premier élément obturateur (11) est couplé à l'élément formant fond de telle sorte que le premier élément obturateur est orienté dans la position fermée dans le cas où l'élément formant fond est orienté dans la position active.
3. Dispositif selon la revendication 1 ou 2, **caractérisé en ce que** le premier élément obturateur (11) est couplé à l'élément formant fond de telle sorte que le premier élément obturateur est orienté dans la position ouverte dans le cas où l'élément formant fond est orienté dans la position non active.
4. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif comprend un moyen d'actionnement couplé au premier élément obturateur pour actionner le premier élément obturateur entre la position ouverte et la position fermée.
5. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, durant le déplacement de la position active à la position non active, l'élément formant fond et le compartiment de dosage sont mutuellement déplaçables sur une distance correspondant à au moins trois fois, de préférence à au moins cinq fois, le diamètre moyen des produits en grains reçus dans le dispositif.
6. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la distance la plus courte entre l'élément formant fond, à la position du compartiment de dosage dans la position active du dispositif, et une paroi supérieure (7) du récipient d'alimentation opposée à l'élément formant fond correspond à au moins quatre fois le diamètre moyen des produits en grains reçus dans le dispositif.
7. Dispositif selon l'une quelconque des revendications

précédentes, **caractérisé en ce que** la distance la plus courte entre l'élément doseur, dans la position active du dispositif, et un élément limitant situé au-dessus de l'élément doseur correspond à au moins quatre fois le diamètre moyen des produits en grains reçus dans le dispositif.

8. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le compartiment de dosage fait partie d'un logement (3) enveloppant au moins partiellement l'élément formant fond.
9. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément formant fond et le compartiment de dosage sont mutuellement déplaçables suivant un parcours sensiblement linéaire.
10. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément formant fond et une surface horizontale contiennent un angle mutuel au moins dans la position active de l'élément formant fond.
11. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément doseur et une surface horizontale contiennent un angle mutuel au moins dans la position non active de l'élément formant fond.
12. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le compartiment de dosage est positionné dans le dispositif de telle sorte que les grains présents dans le compartiment de dosage puissent quitter le dispositif en tombant par l'orifice de distribution et après déplacement du premier élément obturateur jusqu'à la position ouverte.
13. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif comprend un second élément obturateur (12) pour bloquer un passage allant du récipient d'alimentation au compartiment de dosage dans la position non active de l'élément formant fond.
14. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif comprend des moyens de sollicitation (10, 19) pour amener l'élément formant fond jusqu'à la position active.
15. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif comprend une pluralité de compartiments de dosage.

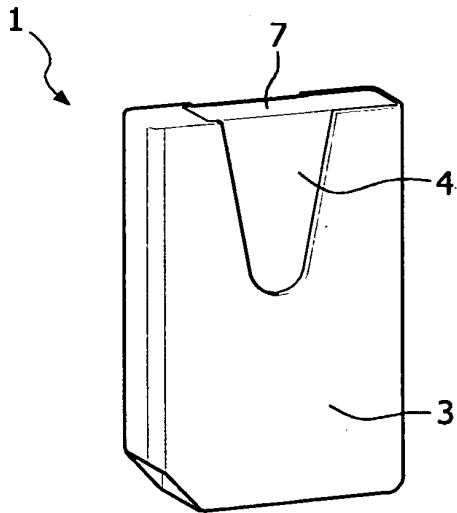


FIG. 1a

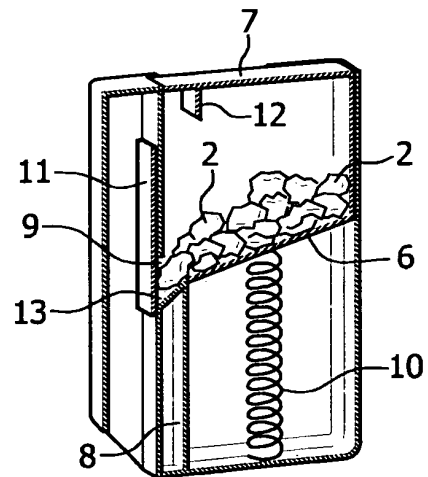


FIG. 1b

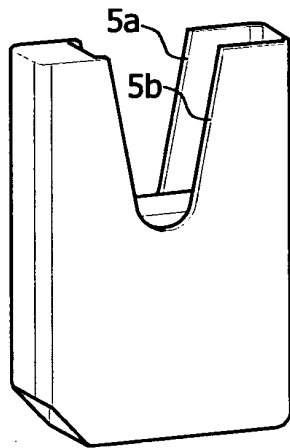


FIG. 1c

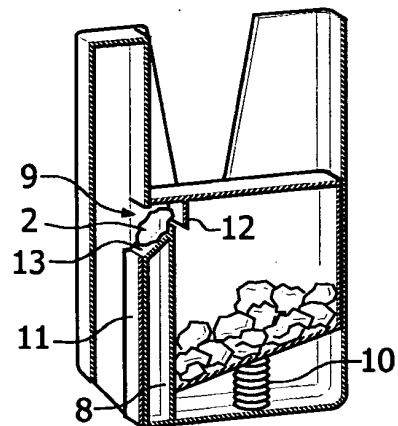


FIG. 1d

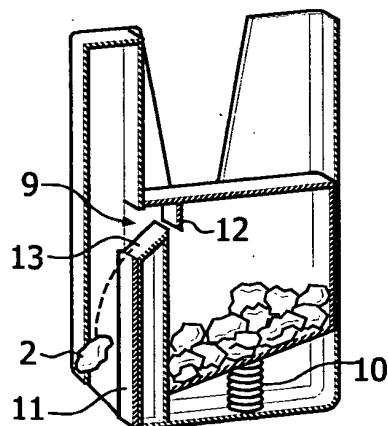


FIG. 1e

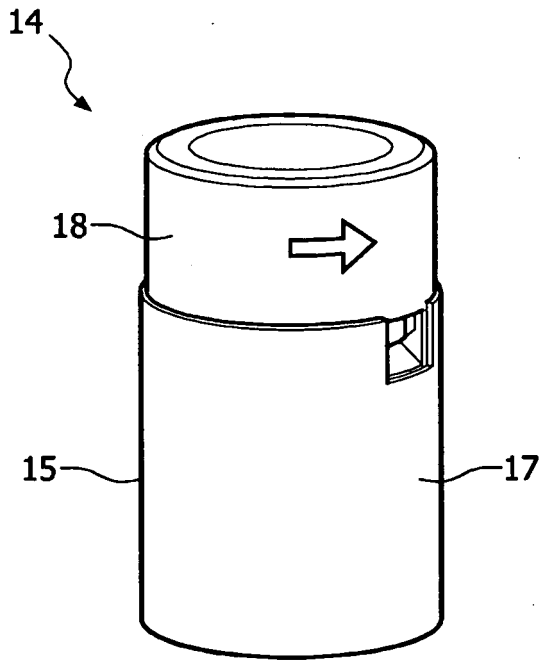


FIG. 2a

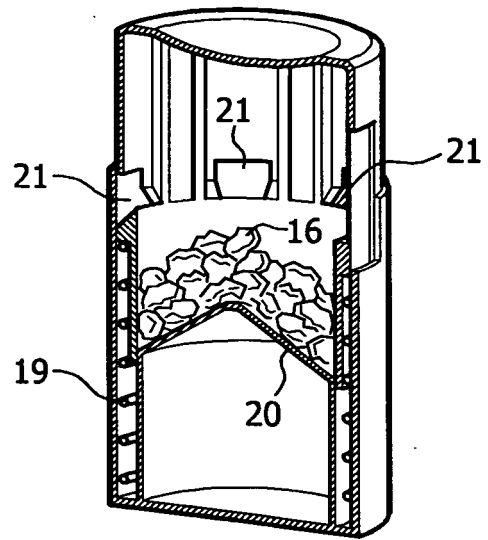


FIG. 2b

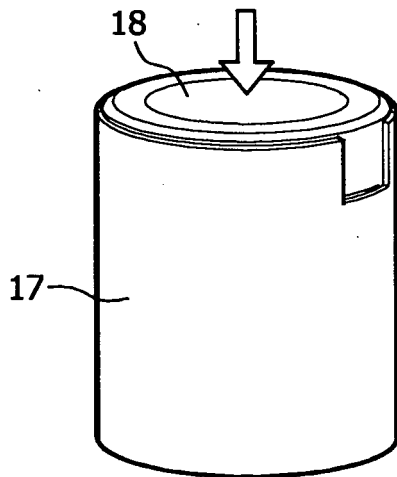


FIG. 2c

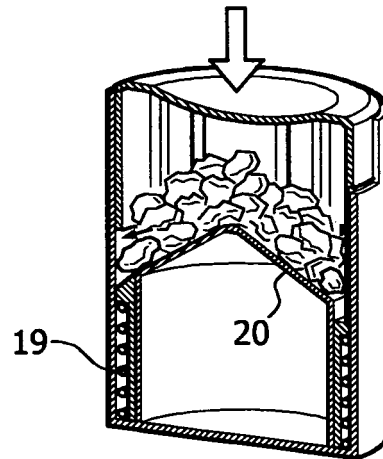


FIG. 2d

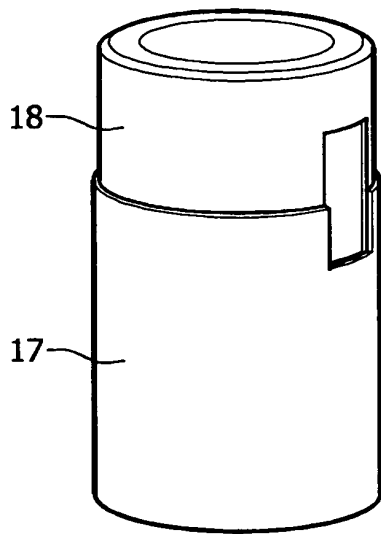


FIG. 2e

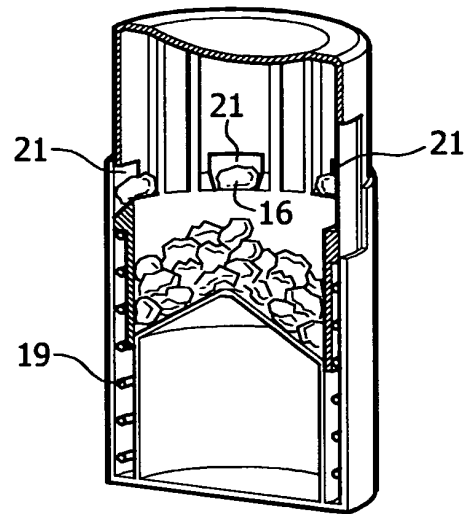


FIG. 2f

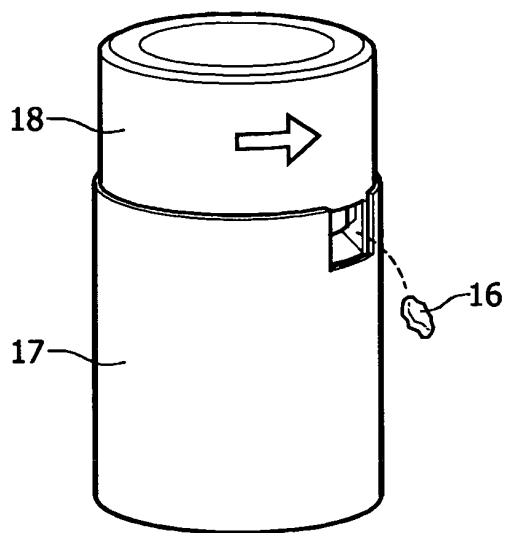


FIG. 2g

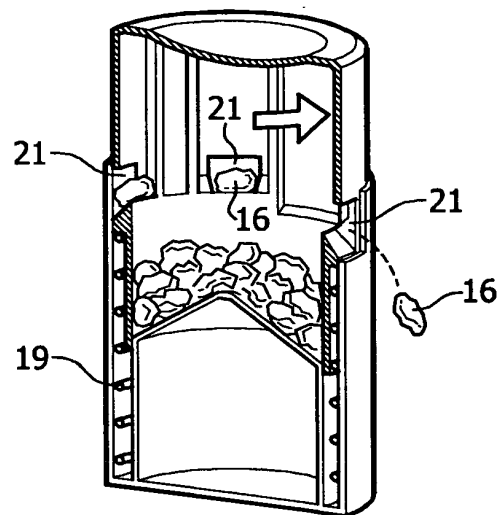


FIG. 2h

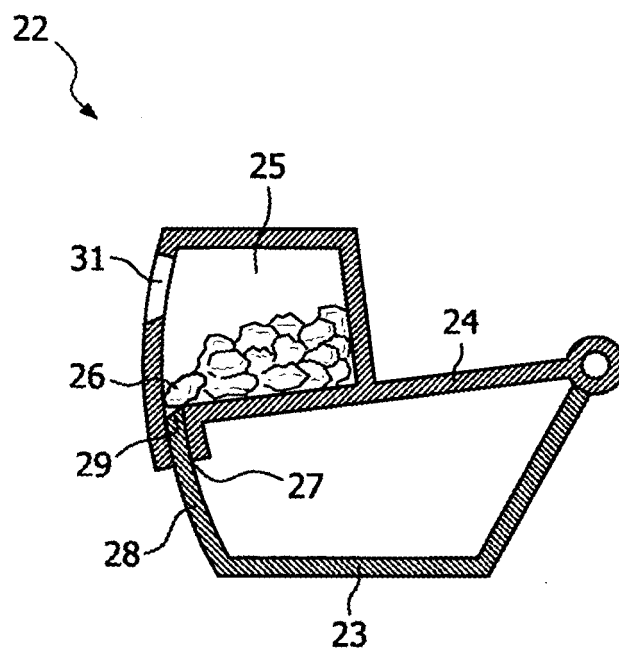


FIG. 3a

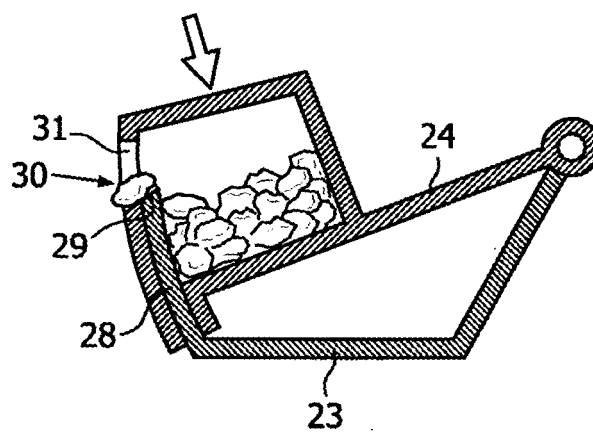


FIG. 3b

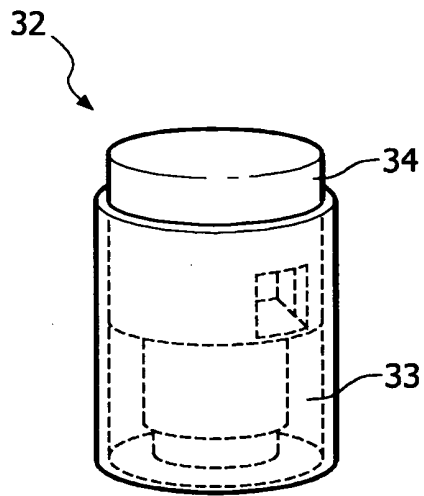


FIG. 4a

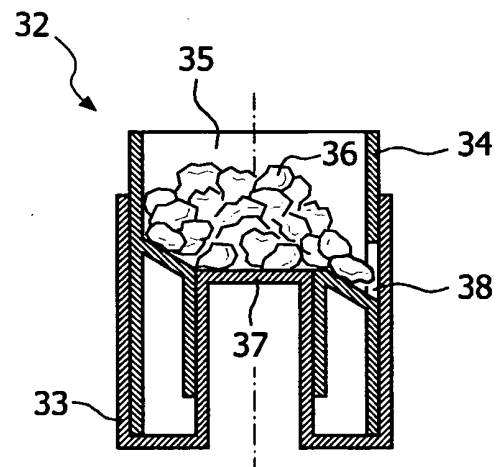


FIG. 4b

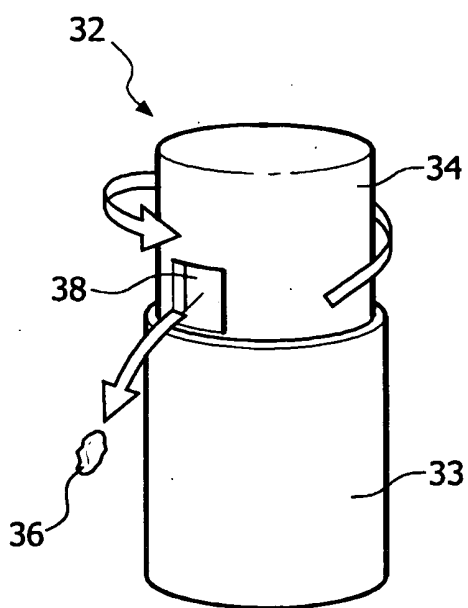


FIG. 4c

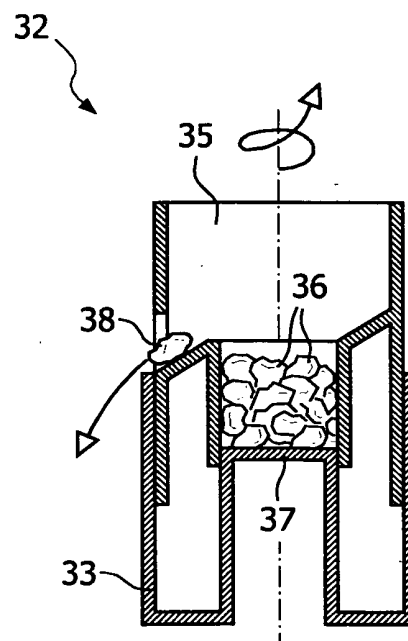


FIG. 4d

REFERENCES CITED IN THE DESCRIPTION

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