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(54) **Title:** BOX OR CRATE IN WHICH LOOSE, MORE OR LESS UNIFORM PRODUCTS ARE PROVIDED AND DOSING DEVICE THAT CAN COOPERATE WITH SUCH BOX OR CRATE

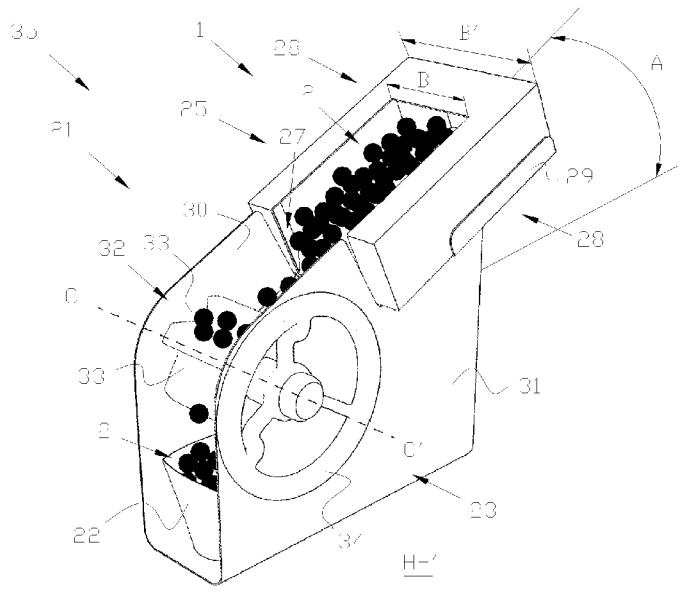

FIG 06

(57) **Abstract:** Box (1) in which loose products (2) are provided, whereby the dimensions of an opening (12) in the box (1) and the dimensions of the loose products (2) are aligned to each other in such a way that in a certain state of balance the loose products (2) do not move out of the box (1) or crate themselves due to the effect of gravity, but whereby from this state of balance by making a shaking or rotating movement on the box (1) at least a part (15) of the loose products (2) can move out of the box (1) or crate due to the effect of gravity on the loose products.

[Continued on next page]

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Box or crate in which loose, more or less uniform products are provided and dosing device that can co-operate with such box or crate.

The present invention relates to a box or crate in which loose, more or less uniform products are provided.

The present invention also relates to a dosing device that can co-operate with such box or crate.

More specifically the invention relates to said box or crate in which loose, more or less uniform, products are provided, such as cherry tomatoes, other vegetables or fruit, etc.

The intention hereby is that the box or crate, in closed condition, serves as packaging for the loose products.

Moreover, the box or crate can be put in an open condition by removing covering parts of the box or crate or by putting covering parts in another position, whereby in the open condition an opening is formed through which the loose products can move out of the box or crate.

Furthermore, the dosing device is meant to deliver a dose of these loose products in a receptacle from a reservoir in the form of a separate box or crate that is not part of the dosing device and in which loose, more or less uniform products are provided, such as cherry tomatoes, other vegetables or fruit, etc.

Naturally the intention is that a box or crate according to the invention and a dosing device according to the invention are fittingly aligned to each other to this end.

The invention is hereby particularly suitable for the packaging of damage-sensitive products and for dispensing doses of such damage-sensitive products from the box.

According to the state of the art, boxes and crates are of course already known with which products such as cherry tomatoes or the like are packaged in bulk.

In the well-known supermarkets and stores it is currently customary that the customers take out the desired quantity of products with their hands from such box or crate, in which the products are packaged in bulk.

However, this is not desirable for hygienic reasons.

Furthermore, customers tend to look for the nicest ones of the offered products by rummaging through the box or crate.

There is a reasonably big chance here that during this search for the nicest products customers cause damage to the products.

Damage to the products furthermore causes premature decay and undamaged products are thus also prematurely affected by germs.

Therefore, the present invention aims to provide a solution to one or several of the aforesaid or possibly other disadvantages.

To this end, the invention relates primarily to a box or crate in which loose, more or less uniform, products are provided, such as cherry tomatoes, other vegetables or fruit, etc. which in closed condition serves as a packaging for the loose products and can be put in an open condition by removing covering parts of the box or crate or by putting covering parts in another position, whereby in the open condition an opening is formed through which the loose products can be taken out of the box or crate, whereby the dimensions of said opening in the box or crate formed in the open

condition and the dimensions of the loose products are aligned to each other in such a way that surrounding parts of at least a part of said opening can form an obstacle, when the box or crate is oriented in a certain state of balance, whereby the loose products in this state of balance are kept in balance in relation to each other and span the opening such that they do not fall out of the box or crate due to the effect of gravity, but whereby from this state of balance by making a shaking or rotating movement on the box the said balance that spans the opening can be broken, such that at least part of the loose products can move out of the box or crate due to the effect of gravity on the loose products.

A big advantage of such a box or crate according to the invention is that, when it is put in the open condition, it can be placed in a certain position which is such that the products cannot roll out themselves, but whereby by making a small rotating or shaking movement a dose of the products can move out of the box or crate due to the effect of gravity.

Such box or crate according to the invention is exceptionally suitable to co-operate with a dosing device according to the invention.

To this end, the invention moreover relates to a dosing device according to the invention that is meant to deliver a dose of these loose products in a receptacle from a reservoir in the form of a separate box or crate that is not part of the dosing device and in which

loose, more or less uniform products are provided, such as cherry tomatoes, other vegetables or fruit, etc., whereby the dosing device more specifically is at least provided with:

- a housing;

- a reservoir holder provided on or to the housing on which such box or crate can be held in a state of balance after it has been put in an open condition whereby an opening is formed through which the loose products can move out of the box or crate, whereby the loose products in this state of balance are kept in balance in relation to each other and span the opening such that they do not fall out of the box or crate due to the effect of gravity; and,

- agitation means that allow the reservoir holder to be subjected to a shaking or rotating movement in order to break said balance that spans the opening temporarily, such that at least part of the loose products can move out of the box or crate due to the effect of gravity on the loose products.

It is clear that a box or crate according to the invention and a dosing device according to the invention can co-operate by putting the box or crate in open condition on the reservoir holder in a state of balance, such that the products do not yet move out of the box or crate themselves.

When a dose of the loose products needs to be dispensed in said receptacle, it suffices to activate the agitation means of the dosing device according to the

invention in order to subject the box or crate to a rotating or shaking movement, such that a dose of loose products due to the effect of gravity can move out of the box or crate into the receptacle.

In a preferred embodiment of a box or crate according to the invention in which loose, more or less uniform, products are provided, the covering parts are formed by parts that can have one or several of the following forms:

- a covering part of the box or crate which in closed condition is defined by a tear line that is meant to be able to tear the part out of the box or crate to form said opening;
- a covering part of the box or crate in the form of a lid which by taking it away leaves said opening in the box or crate uncovered;
- a covering part of the box or crate which by folding it into another position creates said opening in the box or crate.

An advantage of an embodiment of a box or crate according to the invention whereby parts can be torn away along a tear line to form an opening, is that the dimensions of the formed opening have been exactly determined already, such that a good co-operation of the box or crate with a dosing device according to the invention is ensured.

The other said embodiments of a box or crate according to the invention allow the made opening to be covered again to put the box or crate back in closed condition, more specifically by putting the lid back on the box or crate or by folding the covering parts back into a position according to the closed condition.

In another preferred embodiment of a box or crate according to the invention in which loose, more or less uniform, products are provided, the internal walls of the box or crate are provided with such a form or these internal walls are profiled, such that the loose products are guided to at least a part of the opening formed in the box or crate when it is put in the open condition.

A big advantage of such box or crate according to the invention is that due to the form of the internal walls the products due to the effect of gravity are automatically guided to the opening, such that no products remain in corners or badly accessible parts of the box or crate during the delivery of doses of these products from the box or crate, when the box or crate is subjected to a shaking or rotating movement, e.g. with a dosing device according to the invention.

In another preferred embodiment of a box or crate according to the invention in which loose, more or less uniform, products are provided, the box or crate in closed condition has a beam shape with a base, a top

and four sidewalls, whereby in a central part of a sidewall of the box or crate in the open condition there is a channel that forms said opening or at least is part of it, whereby the base of the box or crate in the state of balance is sloping in relation to the horizontal, whereby the surrounding parts of the sidewall along the channel in the sidewall form said obstructing parts and whereby the internal walls of the box or crate on the level of the obstructing parts are provided with a streamlined form in the direction of the channel in the sidewall, which more specifically consists of parts of the internal walls which taper toward this channel.

Such preferred embodiment of a box or crate according to the invention has many advantages.

The beam shaped external contours of the box or crate are exceptionally suitable to stack several such boxes or crates in their closed condition.

Moreover, in the open condition of the box or crate the form of the opening in question is such that doses of products can be easily dispensed along the channel in the said central part of the sidewall.

The parts of the internal walls of the box or crate which taper toward this channel ensure a smooth supply of products to the channel when the box or crate is put in a sloping position in relation to the horizontal, at least in so far the balance condition

is broken by shaking or rotating the box or crate.

Furthermore, it is practical that the obstructing parts are formed by the surrounding parts of the sidewall along said channel.

After all, it suffices to make the channel bigger or smaller or consequently to make these obstructing parts smaller or bigger respectively to change the dimensions of the opening through which the products are dispensed.

It is therefore relatively simple, for example, as a function of the average size of the products, to adapt the opening accordingly to thus realise or enable said balance condition, whereby the products do not move out of the box themselves due to the effect of gravity, but do move out when a certain agitating movement is exercised on the box or crate. In another preferred embodiment of a box or crate according to the invention in which loose, more or less uniform, products are provided, the box or crate additionally has a covering part in closed condition which is defined by a tear line that is meant to be able to tear the part out of the box or crate to form said opening, whereby the opening or tear line extends over the central part of the sidewall in question and over a part of the top.

A big advantage of such embodiment of a box or crate

according to the invention is that products can be dispensed in doses along the central part in the sidewall, while the products are also visibly presented via the part of the opening in the top.

Furthermore, such an open structure of the box or crate in the open condition stimulates a good ventilation of the products or this form allows the products to be sprayed with water, such that the products stay fresh longer or can be stored longer.

The invention also relates to a combination of a box or crate according to the invention and a dosing device according to the invention as described above whereby the box or crate and the dosing device are provided with complementary parts to realise a co-operation, whereby the box or crate in the open condition has an opening of which at least a part, after placement of the box or crate on the reservoir holder of the dosing device, is oriented toward a supply opening of the dosing device and whereby the width of the part in question of the opening corresponds with the width of the supply opening.

It goes without saying that in such combination according to the invention said box or crate and said dosing device because of their special form can co-operate with each other without problem to dispense doses of the products to a receptacle.

The invention also relates to a box or crate, which in closed condition can serve as packaging for loose products such as cherry tomatoes, other vegetables or fruit, etc. and can be put in an open condition by removing covering parts of the box or crate or by putting covering parts in another position, whereby the box or crate in closed condition has a beam shape with a base, a top and four sidewalls, whereby in the open condition an opening is formed along which the loose products can move out of the box or crate, characterised in that the box or crate in closed condition has a covering part that is defined by a tear line for tearing the part out of the box or crate to form said opening, whereby the opening or tear line extends over the central part of a sidewall in question and over a part of the top, whereby in this central part of this sidewall of the box or crate in the open condition there is a channel that is part of said opening, whereby the internal walls of the box or crate on the level of the surrounding parts of the sidewall along the channel in the sidewall are provided with a streamlined form in the direction of the channel in the sidewall, which more specifically consists of parts of the internal walls that taper toward this channel.

Such box or crate according to the invention is suitable to package loose products in and to dispense these products in doses from the box or crate to a receptacle according to a method as described above and will be explained in more detail based on figures.

With the intention of better showing the characteristics of the invention, hereafter by way of an example without any limiting nature, a number of preferred embodiments are described of a box according to the invention, as well as a box in which loose, more or less uniform products are provided according to the invention, a dosing device according to the invention and a combination of a box and a dosing device according to the invention, with reference to the accompanying drawings, wherein:

figure 1 shows a perspective view of a box according to the invention in closed condition;
figure 2 shows a perspective view of the same box in an open condition;
figure 3 shows a perspective view of the box in figure 2 in an open condition;
figure 4 shows a perspective view of a dosing device according to the invention;
figure 5 shows a perspective view and combination according to the invention of the box shown in figure 1 and the dosing device shown in figure 4;
figure 6 shows a perspective view of the same combination shown in figure 5 during the use thereof for dispensing doses of products;
figures 7 and 8 show a perspective view of two possible other embodiments of a combination of a box and dosing device according to the invention;

figures 9 and 10 show a perspective view of yet another possible embodiment of a combination of a box and a dosing device according to the invention; and,

figure 11 shows the box indicated with F11 in figure 10 magnified, when put another position.

The box 1 according to the invention shown in the figures 1 and 2 in closed condition, which is shown in figure 1, serves as packaging for loose products 2, such as e.g. cherry tomatoes 2.

In the embodiment shown, this box 1 in its closed condition has a beam shape with a base 3, a top 4 and two pairs of opposite parallel sidewalls 5, 6 and 7, 8.

The box 1 in closed condition has a covering part 9 that is defined by a tear line 10.

This tear line 10 is meant to form a tear or cut 11 in a simple way along the tear line 10 and to thus be able to tear the covering part 9 out of the box to form an opening 12.

In this way the box 1 is put in an open condition which is shown in figure 2.

In the embodiment shown, the opening 12 or the tear line 10 extends over the central part 13 of the sidewall 5 and over a part 14 of the top 4 of the box 1.

More specifically by tearing or cutting away the covering part 9 in the central part 13 of this sidewall 5 of the box 1 a rectangular channel 15 is formed with width B that extends from the base 3 to the top 4 of the box 1.

By tearing or cutting away the covering part 9 in the top 4 a rectangular hole 16 is also formed that extends from the channel 15, whereby the hole 16 also has a width B and a length L, which each respectively are somewhat smaller than the width B' and the length L' of the box 1 itself.

The channel 15 and the hole 16 together form the opening 12. The internal walls 17 of the box 1 on the level of the surrounding parts 18 of the sidewall 5 along the channel 15 in this sidewall 5 are provided with a streamlined form in the direction of the channel 15.

This streamlined form is preferably formed by parts 19 of the internal walls 17 that taper toward this channel 15.

In this case, the internal walls 17 of the box 1 are on the level of the connection between the sidewalls 5 to 7 executed with a bevelled edge 20, the bevelled edges 20 of which that are adjacent to the channel 15 form such parts 19 with a streamlined form.

On the other hand, the parts 18 which surround the channel 15 laterally can be considered as parts 18 that can form an obstruction for products 2 in the box 1, in the sense that they somewhat restrict the moving out of the box 1 of such products 2, at least compared in relation to an embodiment whereby the width B of the channel 15 were to correspond with, for example, the entire width B' of the box 1.

This is an extremely important aspect of the present invention.

According to the invention it is in fact the intention that the dimensions of said opening 12 in the box 1 formed in the open condition of the box 1 and the dimensions of the loose products 2, are aligned to each other in such a way that surrounding parts 18 of at least a part of said opening 12 can form an obstruction, when the box 1 is oriented in a certain state of balance, whereby the loose products 2 in this state of balance are kept in balance in relation to each other and span the opening 12 such that they do not move out of the box 1 themselves due to the effect

of gravity, but whereby from this state of balance by making a shaking or rotating movement on the box 1 said balance that spans the opening 12 can be broken, such that at least a part of the loose products 2 can move out of the box 1 due to the effect of gravity on the loose products 2.

In short, in the embodiment discussed here, by suitably choosing the width B of the channel 15 as a function of the average size of the products 2, for example as a function of the average diameter D of the cherry tomatoes 2, it is possible to make sure that the outflow of the products or cherry tomatoes 2 in the box 1 is somewhat obstructed by the parts 18, when this box 1 is held in a certain position, whereas by a small agitation of the box 1 it is possible to break the balance in order to make the products or cherry tomatoes 2 move out of the box from the same position due to the effect of gravity.

A possible state of balance of the box 1 in the open position that is filled with cherry tomatoes 2 is shown in figure 3 by way of example.

More specifically, the base 3 of the box 1 preferably is oriented in a sloping way in such state of balance in relation to the horizontal, whereby the surrounding parts 18 of the sidewall 5 along the channel 15 in the sidewall 5 form the obstructing parts.

For example, the box 1 in such state of balance can be positioned at an angle A of 25° or more.

Figure 4 shows a possible embodiment of a dosing device 21 according to the invention. This dosing device 21 is meant to dispense doses of products 2 in a receptacle 22 from a reservoir that is not part of the dosing device 21, such as e.g. a box 1 shown in figures 1 to 3.

To this end the dosing device 21 is provided with a housing 23 on which a reservoir holder 24 is provided that is intended to hold the external reservoir, for instance a box 1, in a desired position.

More specifically the reservoir holder 24 is meant to be aligned to the reservoir or the box 1, such that it can be held in the said state of balance, for example with the base 3 sloping at an angle A in relation to the horizontal.

The intention hereby is that such a box 1 can be held in a state of balance after it has been put in an open condition whereby an opening 12 or channel 15 is formed along which the loose products 2 can move out of the box 1, but whereby the loose products 2 in this state of balance are kept in balance in relation to each other and span the opening 12 or channel 15, such that

they do not move out of the box 1 due to the effect of gravity.

Moreover, the dosing device 1 is provided with agitation means 25, which in the figures is not worked out in detail and which allow the reservoir holder 24 to be subjected to a shaking or rotating movement in order to temporarily break said balance that spans the opening 12, such that at least a part of the loose products 2 can move out of the box 1 due to the effect of gravity on the loose products 2.

This is illustrated by way of example in figure 6.

In the example shown, the reservoir holder 24 contains an inclined platform 26 that extends from the housing 23 on the level of a supply opening 27 in the housing 23, which supply opening 27 is used to receive loose products 2 from the reservoir or the box 1.

Hereby, the side edges 28 of the platform 26 are each formed by an upstanding edge 29 between which a box 1 can be fitted.

In short, the upstanding edges 29 along the platform 26 extend parallel to each other at a distance B' from each other according to the width B' of a box 1.

The platform 26 extends in a sloping plane at an angle

A in relation to the horizontal plane HH'.

Moreover, the housing 23 of the dosing device 21 contains two parallel sidewalls 30 and 31, whereby a drum 32 is suspended rotatably between these two sidewalls 30 and 31 around an axis CC' that extends perpendicular to the sidewalls 30 and 31.

The drum 32 is provided with grooves 33 which extend parallel to the axis CC' and which are meant to catch the loose products 2 supplied from the supply opening 27.

The drum 32 can be manually operated by means of a wheel 34.

A rotation of the drum 32 activates the agitation means 25 for a shaking movement of the reservoir holder 24, in order to make loose products 2 or cherry tomatoes 2 move out of a box 1 positioned on the reservoir holder 24 into a groove 23 of the drum 32.

Such shaking movement can be, for example, an up and down movement or a to and fro movement or a combination thereof.

The movement can be a vibrating movement and can, for example, be such vibrating movement the amplitude of which is so small that it is not perceptible with the

naked eye.

According to an aspect of the invention the agitation means 25 comprise mechanical elements which realise a direct or indirect contact between, on the one hand, the reservoir holder 24 and, on the other hand, the drum 32 or the wheel 34 or another element that is also driven by operating the wheel 34.
Preferably, the reservoir holder 24 is attached hingeably or slidably to the housing 23 of the dosing device 21.

The mechanical elements can, for example, concern one or more arms which are connected with the reservoir holder 24 and which reach to a serrated wheel or the like that is provided between the drum 32 and the walls 30 and 31 of the housing.

A turn of the wheel 34 produces a turn of the drum 32 and also a turn of one or more serrated wheels, which serrated wheel then makes alternating contact with the one or more arms.

Because this arm or these arms are rigidly connected with the reservoir holder 24, which is attached hingeably to the housing 23 of the dosing device 21, the reservoir holder 24 will be shaken as intended when the wheel 34 is turned.

It is clear that the wheel 34 could also be provided with parts reaching up to the reservoir holder 24 which when the wheel 34 is turned make alternating contact with the reservoir holder 24.

In the example shown in the figures 4 to 6 the reservoir holder 24 has a width B', according to the width B' of a box 1 which is greater than the width B of the housing 23 and the width B of the supply opening 27 of the dosing device 21.

The combination 35 of a dosing device 21 and a box 1 according to the invention shown in the figures 5 and 6 is such that the box 1 and the dosing device 21 are provided with complementary parts in order to realise a co-operation thereof.

Hereby the box 1 in the open condition has an opening 12 at least a part of which, more specifically the channel 15 after positioning the box 1 on the reservoir holder 24 of the dosing device 21, is oriented toward the supply opening 27 of the dosing device 21.

The width B of the part 15 in question, more specifically of the channel 15, of the opening 12 corresponds with the width B of the supply opening 27.

The box 1 and the reservoir holder 24 are substantially wider than the supply opening 27 of the dosing device 21.

This provides the advantage that a relatively small or narrow dosing device 21 can be used to empty a relatively wide box 1.

The form of the internal walls 17 of the box 1 makes sure that there is a good guidance of the products 2 to the supply opening 27 and ensures that the whole box 1 is completely emptied without any problem without any of the loose products 2 staying behind in corners or the like, when these products 2 are moved dose by dose from the box 1 under the influence of gravity after activation of the agitation means 25.

Figure 7 shows another embodiment of a combination 35 of a box 1 and a dosing device 21 according to the invention.

In the box 1 of this combination 35 loose, more or less uniform products 2 are again provided, and the box 1, in closed condition, again essentially has a beam shape with a base 3, a top 4 and four sidewalls 5 to 8.

However, the box 1 in this embodiment is made somewhat differently, whereby in a lateral part 36 of the top 4 of the box 1 near the sidewall 5 in the open condition there is a channel 15 which completely forms the opening 12 as defined above.

This channel 15 or opening 12 in the box 1 is obtained by, from the closed condition, folding or moving a number of covering parts 9 of the box 1 in another position.

In the example shown, these covering parts 9 in the open condition form a kind of container which somewhat sticks out of the rest of the box 1.

Just as in the previous embodiment the box 1 can again be placed in a state of balance, whereby the cherry tomatoes 2 do not move out of the box 1 by themselves.

More specifically the wall in question 4 with channel 15 of the box 1 in the state of balance is sloping in relation to the horizontal.

The adjacent parts 37 along the channel 15 hereby form said obstructing parts of the box 1 which make sure the products 2 effectively do not move out of the box 1 by themselves, but only following the effect of a certain agitation of the box 1, at least in so far the dimensions of the channel 15 or opening 12 and the

dimensions of the products 2 are well aligned to each other.

In the case of figure 7 the agitating movement consists of a fluctuating movement around an EE' axis perpendicular to the walls 30 and 31 of the housing 23 of the dosing device 21, whereby the cherry tomatoes 2 can fall directly from the box 1 into a receptacle 22.

In the case of figure 7, the reservoir holder 24 is made differently too and has a width B' which corresponds with the width B' of the housing 23 and with the width B' of the supply opening 27 of the dosing device 21 to receive loose products 2 from the reservoir 1.

This width B' also corresponds with the width B' of the box 1.

Figure 8 shows yet another embodiment of a combination 35 of a box 1 and a dosing device 21 according to the invention, which shows many similarities with the embodiment of figure 7.

However, in this case, a covering part 9 forms a kind of flap which can be folded in order to form an opening 12 or channel 15, this time in the front wall 5 of the box 1.

The wall 5 in question with channel 15 of the box 1 in the state of balance is also oriented perpendicular in relation to the horizontal plane HH'.

The intention hereby is that cherry tomatoes 2 from this state of balance are moved directly by a vibrating movement made with the agitation means 25 dose by dose to a receptacle 22.

In the figures 9 to 11 yet another embodiment of a combination 35 of a box or crate 1 and a dosing device 21 according to the invention is shown, which, however, shows many similarities with the embodiment shown in the figures 5 and 6.

The dosing device 21 shown in the figures 9 and 10 also has a housing 23 with parallel sidewalls 30 and 31 between which a drum 32 with grooves 33 is applied and whereby the drum 32 can be operated manually by an external wheel 34.

The reservoir holder 24 is also made as an inclined platform 26 which at an angle A sticks out from a supply opening 27.

However, this time this inclined platform 26 is made essentially flat whereby on the side edges 28 no upstanding edge 29 is provided.

The width B' of the inclined platform is in this case equal to the distance B' between the parallel sidewalls 30 and 31, as well as the width B' of a box 1.

To ensure that an accompanying box 1 according to the invention is correctly positioned on the reservoir holder 24 and remains in the right position during the shaking of the reservoir holder 24, the inclined platform 26 in this embodiment is made with a pair of pins 38 provided on the outer corners 39 of the inclined platform 26.

These pins 38 can be fittingly inserted in a pair of corresponding holes, that are not shown in the figures, and which are provided in the base 3 of the box or crate 1.

Moreover, on each of the side edges 40 and 41 of the parallel sidewalls 30 and 31 of the housing 23 a protrusion is also provided, protrusions 42 and 43 respectively.

These protrusions 42 and 43 extend in the extension of the plane formed by each of the parallel sidewalls 30 and 31 and it is the intention that the protrusions 42 and 43 when positioning a box or crate 1 on the reservoir holder 24 are inserted in corresponding holes 44 and 45 provided in the front sidewall 5 of the box or crate 1.

Due to the co-operation of the protrusions 42 and 43 and the corresponding holes 44 and 45, as well as of the pins 38 and the holes in the base 3 of the box 1, the box 1 is correctly positioned on the reservoir holder 24, whereby the channel 15 in the box 1 is centrally aligned in the supply opening 27 of the dosing device 21.

In the embodiment of the figures 9 and 10 the protrusions 42 and 43 are asymmetrically executed in relation to the central plane between the parallel sidewalls 30 and 31.

More specifically, the protrusion 42 is applied to the sidewall 30 at a distance D in relation to the inclined platform 26 which is greater than the distance D' at which the protrusion 43 is applied to the sidewall 31.

Similarly, the holes 44 and 45 are of course also asymmetrically executed in relation to the central vertical plane through the box 1, whereby the hole 44 is provided at a distance D in relation to the base 3 and hole 45 at a smaller distance D' in relation to this base 3.

However, according to the invention it is not excluded to provide the dosing device 21 and an accompanying box 1 with other co-operating,

complementary parts with the intention of ensuring the correct positioning of the box 1 on the dosing device 21 and also ensuring that the box 1 is held solidly on the reservoir holder 24 during the use of the dosing device 21.

The box 1 in the figures 9 to 11 still has characteristics that differ somewhat from the embodiment of a box 1 shown in the figures 1 and 2.

More specifically the box 1 is also provided with a covering part 9 that is defined by a tear line 10, which, however, only extends over the front sidewall 5.

By tearing or cutting away the covering part 9 in the central part 13 of this sidewall 5 of the box 1 a rectangular channel 15 is formed with width B that extends from the base 3 to the top 4 of the box 1.

The tear line 10 does not extend into the top 4, which was the case in the embodiment of box 1 shown in the figures 1 and 2.

In this case the top 4 of the box 1 is provided with a transparent part 46, which, for example, is made of a transparent plastic foil and forms a kind of window 46 in this top 4 that is meant to present the products 2 in the box 1.

An advantage of this embodiment is that people cannot easily get to the products 2 in the box 1 with their hands, which was one of the objectives of the invention.

In figure 11 another aspect of this embodiment of the box 1 is illustrated, more specifically that the box 1 can also be used independently from a dosing device 21 according to the invention to manually take products 2 out of the box 1.

The box 1 in this embodiment, just as in the embodiment of figure 7, is executed more specifically with a covering part 47 that is provided in a lateral part 36 of the top 4 of the box 1 near the sidewall 5.

The intention hereby is that for manually taking products 2 out of the box 1, the covering part 9 in the sidewall 5 is not opened by using the tear line 10, but that, on the contrary, the sidewall 5 is positioned on a foundation 48, while the top 4 in this case is oriented vertically.

By folding or moving the covering part 47 of the box 1 from the closed condition of the box 1 into another position which is shown in figure 11, a channel 15 in the top 4 is formed along which the products 2 can be

taken out of the box 1.

In the open position, the covering part 47 hereby forms a kind of drawer 49 from which a user can take the loose products 2 with his/her hand.

The present invention is by no means limited to the embodiments described as an example of a box or crate 1, a dosing device 21 or a combination 35 thereof according to the invention but this box or crate 1, dosing device 21 or a combination 35 thereof be realised in all kinds of forms and dimensions without departing from the scope of the invention.

Claims.

1. Box (1) or crate in which loose, more or less uniform products (2) are provided, such as cherry tomatoes (2), other vegetables or fruit etc., which in closed condition serves as packaging for the loose products (2) and can be put in an open condition by removing one or several covering parts (9) of the box (1) or crate or by putting one or several covering parts (9) in another position, whereby in the open condition an opening (12) is formed through which the loose products (2) can move out of the box (1) or crate, characterised in that the dimensions of said opening (12) in the box (1) or crate formed in the open condition and the dimensions of the loose products (2) are aligned to each other in such a way that surrounding parts (18) of at least a part (15) of said opening (12) can form an obstruction, when the box (1) or crate is oriented in a certain state of balance, whereby the loose products (2) in this state of balance are kept in balance in relation to each other and span the opening (12) such that they do not move out of the box (1) or crate themselves due to the effect of gravity, but whereby from this state of balance by making a shaking or rotating movement on the box (1) said balance that spans the opening (12) can be broken, such that at least a part (15) of the loose products (2) can move out of the box or crate due to the effect of gravity on the

loose products (2), whereby the covering parts (9) are formed by parts that have one or several of the following forms:

- a covering part (9) of the box (1) or crate which in closed condition is defined by a tear line (10) that is intended to be able to tear out the part (9) of the box or crate to form said opening (12);

- a covering part of the box (1) or crate in the form of a cover which by taking it away leaves said opening (12) in the box (1) or crate uncovered;

- a covering part of the box or crate which by folding it into another position creates said opening in the box or crate; and whereby the internal walls (17) of the box (1) or crate are provided with a suchlike form or are profiled such that the loose products (2) are guided to at least a part (15) of the opening (12) formed in the box (1) or crate when put in the open condition, whereby it is also understood that the box or crate in closed condition has a beam shape with a base (3), a top (4) and four sidewalls (5-8), whereby in a central part (13) of a sidewall (5) of the box (1) or crate in the open condition there is a channel (15) which forms said opening (12) or at least is part (15) of it, whereby the base (3) of the box (1) or crate in the state of balance slopes at an angle (A) in relation to the horizontal, whereby the surrounding parts (18) of the sidewall (5) along the channel (15) in the sidewall (5) form said obstructing parts (18) and whereby the internal walls (17) of the box (1) or crate on the level of

the obstructing parts (18) are provided with a streamlined form in the direction of the channel (15) in the sidewall, which consists of, more specifically, parts (19) of the internal walls (17) that taper to this channel (15).

2. Box (1) or crate according to claim 1 in which loose, more or less uniform, products (2) are provided, characterised in that the box (1) or crate in closed condition has a covering part (9) defined by a tear line (10) that is intended to be able to tear or cut the part (9) out of the box or crate to form said opening (12), whereby the opening (12) or tear line (10) extends over the central part (13) of the sidewall (5) in question and over a part (14) of the top (4).

3. Box (1) or crate according to claim 1 or 2 in which loose, more or less uniform, products (2) are provided, characterised in that the internal walls (17) of the box (1) or crate on the level of the connections between the sidewalls (5-7) or on the level of the four corners of the box (1) or crate are executed with a bevelled edge (20).

4. Box (1) or crate according to one or several of the claims 1 to 3 in which loose, more or less uniform, products (2) are provided, characterised in that the box (1) or crate in closed condition essentially has a beam shape with a base (3), a top (4) and four

sidewalls (5-8), whereby in a lateral part of a sidewall (5-8), the base (3) or the top (4) of the box (1) or crate 5 in the open condition there is a channel (15) that forms said opening (12), whereby the wall (3-8) in question with the channel (15) of the box (1) or crate in the state of balance is oriented in a sloping or perpendicular way in relation to a horizontal plane HH', whereby the adjacent parts (18,37) along the channel (15) form the said obstructing parts.

5. Box (1) or crate according to one or several of the preceding claims in which more or less loose uniform products (2) are provided, characterised in that the box or crate (1) is provided with a covering part (9) defined by a tear line (10) and which can be put in a first open position by removing the covering part (9) by tearing or cutting along the tear line (10) to form a channel (15) in a sidewall (5) of the box or crate (1) and that the box or crate (1) is also provided with a covering part (47), whereby by moving or folding the covering part (47) the box or crate (1) can be put in a second open position with an opening (12) in the top (4) and whereby the covering part (47) in this open position forms a drawer (49).

6. Dosing device (21) intended to dispense a dose of these loose products (2) in a receptacle (22) from a reservoir in the form of a separate box (1) or crate that is not part of the dosing device (21) and

in which loose, more or less uniform products (2) are provided, such as cherry tomatoes (2), other vegetables or fruit, etc., characterised in that the dosing device (21) is at least provided with:

- a housing (23);
- a drum (32) provided with grooves (33) that is meant to catch loose products (2) to dispense them directly or indirectly in a dosed way to the receptacle (22);
- a reservoir holder (24) provided on or to the housing (23) on which such box (1) or crate can be held in a state of balance after it was put in an open condition whereby an opening (12) is formed through which the loose products (2) can move out of the box (1) or crate, whereby the loose products (2) in this state of balance are kept in balance in relation to each other and span the opening (12) such that they do not move out of the box (1) or crate by themselves due to the effect of gravity; and,
- agitation means (25) which comprise mechanical elements which realise direct or indirect contact, possibly alternating, between, on the one hand, the reservoir holder (24) applied hingeably or slidably to the housing (23) of the dosing device (21) and, on the other hand, the drum (32) and/or a wheel (34) or the like for the operation of the drum (32), which agitation means (25) allow the reservoir holder (24) to be subjected to a shaking or rotating movement in order to temporarily break said balance

that spans the opening (12), such that at least a part of the loose products (2) can move out of the box (1) or crate due to the effect of gravity on the loose products (2).

7. Dosing device (21) according to claim 6, characterised in that the mechanical elements concern one or more arms which are connected with the reservoir holder (24) and which reach to a serrated wheel or the like that turns along with the drum (32).

8. Dosing device (21) according to claim 7, characterised in that a wheel (34) or the like is provided for the operation of the drum (32), and that the wheel (34) is provided with parts reaching up to the reservoir holder (24) which when turning the wheel (34) make alternating contact with the reservoir holder (24).

9. Dosing device according to claim 6, 7 or 8, characterised in that the reservoir holder (24) contains an inclined platform that extends from the housing on the level of a supply opening (27) in the housing (23) to receive loose products from the reservoir (1), whereby the side edges of the platform are each formed by an upstanding edge between which a box or crate can be fitted.

10. Dosing device (21) according to claim 6, 7, 8 or

9, characterised in that the housing (23) of the dosing device (21) contains two parallel sidewalls (30,31), whereby a drum (32) is suspended rotatably between these two sidewalls (30, 31) around an axis (CC') which extends perpendicular to the sidewalls (30,31), whereby the drum (32) is provided with grooves (33) that extend parallel to the axis (CC') and which are meant to catch loose products (2) supplied from the supply opening (27).

11. Dosing device (21) according to claim 10, characterised in that a rotation of the drum (32) activates the agitation means (25) for a shaking movement of the reservoir holder (24), in order to move loose products (2) from a box (1) or crate positioned on the reservoir holder (24) in a groove (33) of the drum (32).

12. Combination (35) of a box (1) or crate according to one or several of the claims 1 to 5 and a dosing device (21) according to one or several of the claims 6 to 11, characterised in that the box (1) or crate and the dosing device (21) are provided with complementary parts in order to realise a co-operation, whereby the box (1) or crate in the open condition has an opening (12) at least a part (15) of which, after positioning the box (1) or crate on the reservoir holder (24) of the dosing device (21), is oriented toward a supply opening (27) of the dosing device (21).

13. Combination (35) of a box (1) or crate and a dosing device (21) according to claim 12, characterised in that the box (1) or crate and the dosing device (21) are provided with co-operating, complementary parts (38, 42-45) that are meant to position and hold a box (1) or crate correctly on the dosing device (21) when used.

14. Combination (35) of a box (1) or crate and a dosing device (21) according to claim 13, characterised in that the co-operating, complementary parts (38, 42-45) of the box (1) or crate and the dosing device (21) are formed by one or several of the following elements;

- a pair of pins (38) provided on the reservoir holder that can co-operate with a pair of holes in the base (3) of the box (1) or crate;

- a pair of protrusions (42, 43) that can co-operate with a pair of holes (44, 45) in a sidewall (5) of the box (1) or crate.

15. Box (1) or crate, which in closed condition can serve as packaging for loose products (2) such as cherry tomatoes (2), other vegetables or fruit, etc. and can be put in an open condition by removing covering parts (9) of the box (1) or crate or by putting covering parts (9) thereof in another position, whereby the box (1) or crate in closed condition has a beam shape with a base (3), a top (4) and four sidewalls (5-8), whereby in the open

condition an opening (12) is formed along which the loose products (2) can move out of the box (1) or crate, characterised in that the box (1) or crate in closed condition has a covering part (9) that is defined by a tear line (10) intended to tear or cut the part (9) out of the box (1) or crate to form said opening (12), whereby the opening (12) or tear line (10) extends over the central part (13) of a sidewall (5) in question and over part (14) of the top (4), whereby in this central part (13) of this sidewall (5) of the box or crate in the open condition there is a channel (15) that is part of said opening (12), whereby the internal walls (17) of the box (1) or crate on the level of the surrounding parts (18) of the sidewall (5) along the channel (15) in the sidewall (5) are provided with a streamlined form in the direction of the channel (15) in the sidewall (5), which more specifically consists of parts (19) of the internal walls (17) that taper toward this channel (15).

16. Box (1) or crate according to claim 15, characterised in that the internal walls (17) of the box (1) or crate on the level of the connection between the sidewalls (5-8) or on the level of the four corners of the box (1) or crate are made with a bevelled edge (20).

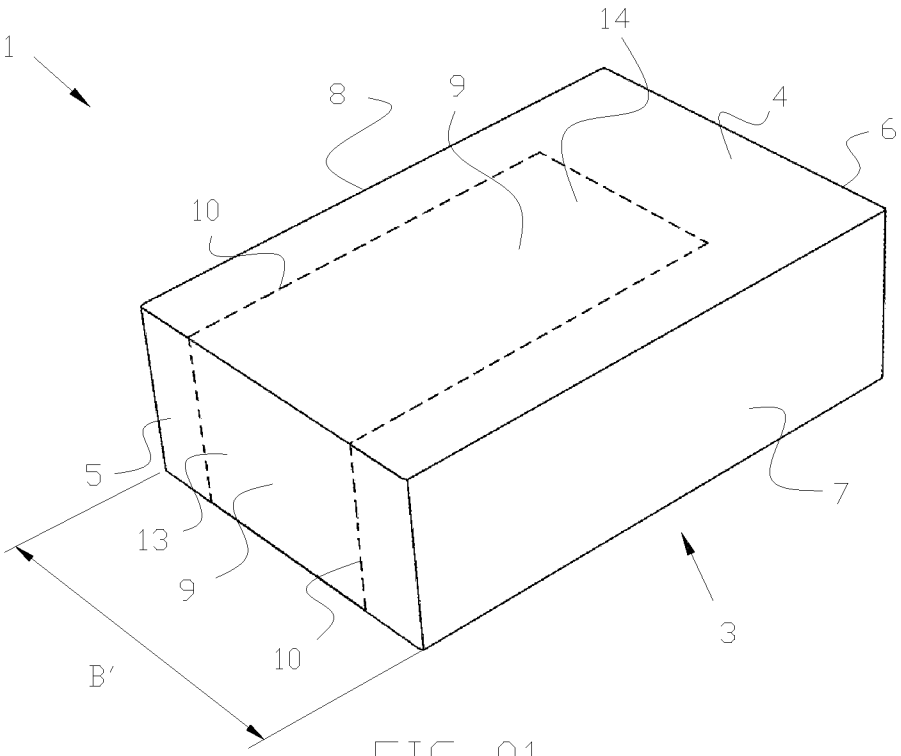
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FIG 01

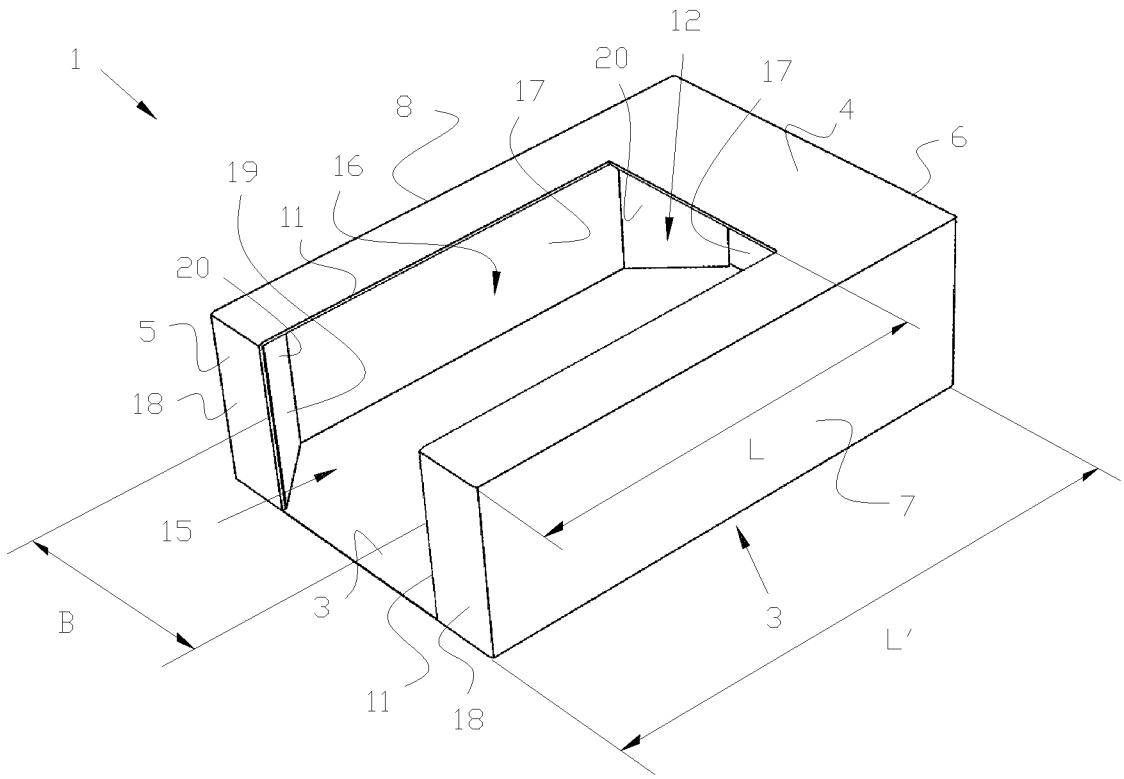
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FIG 02

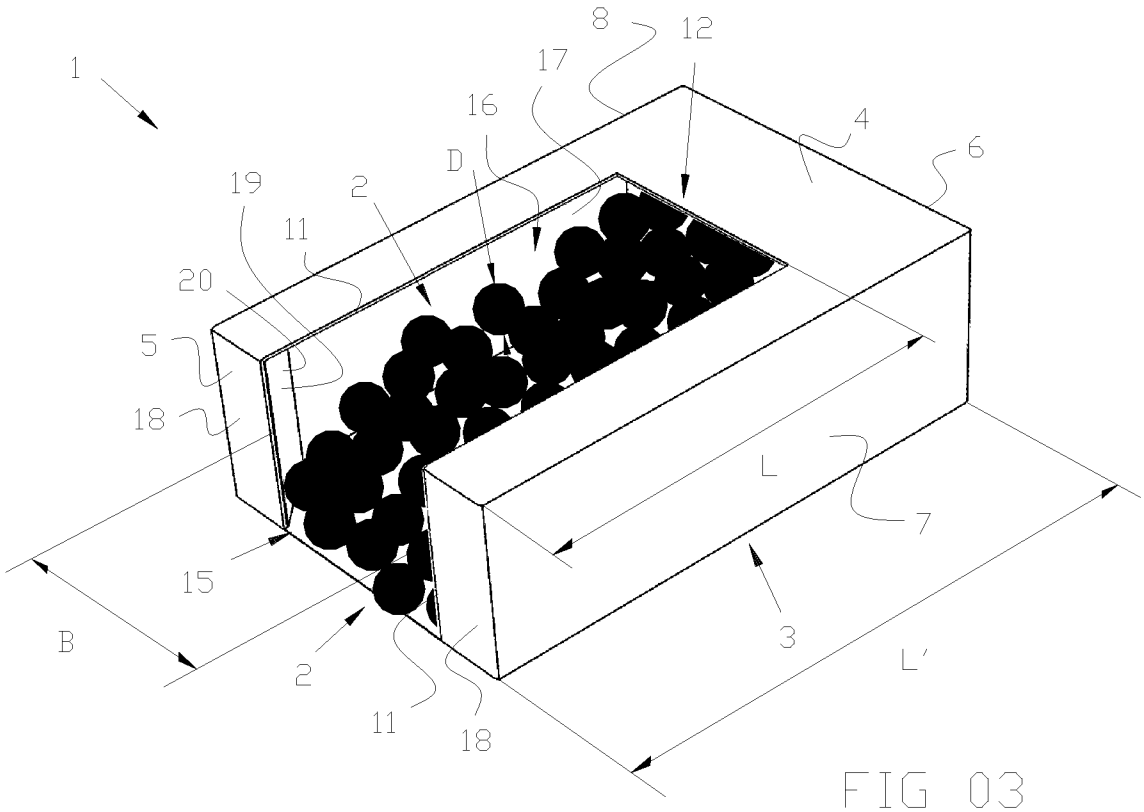
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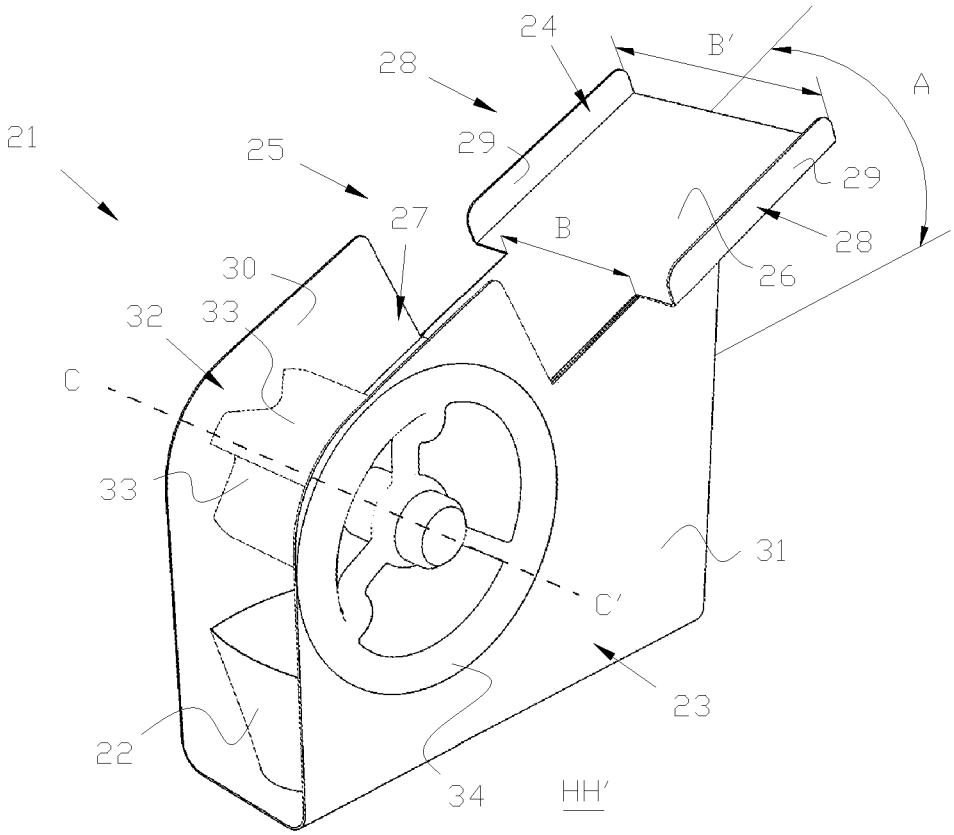
FIG 03


24
B'
28
A
21
25
29
29
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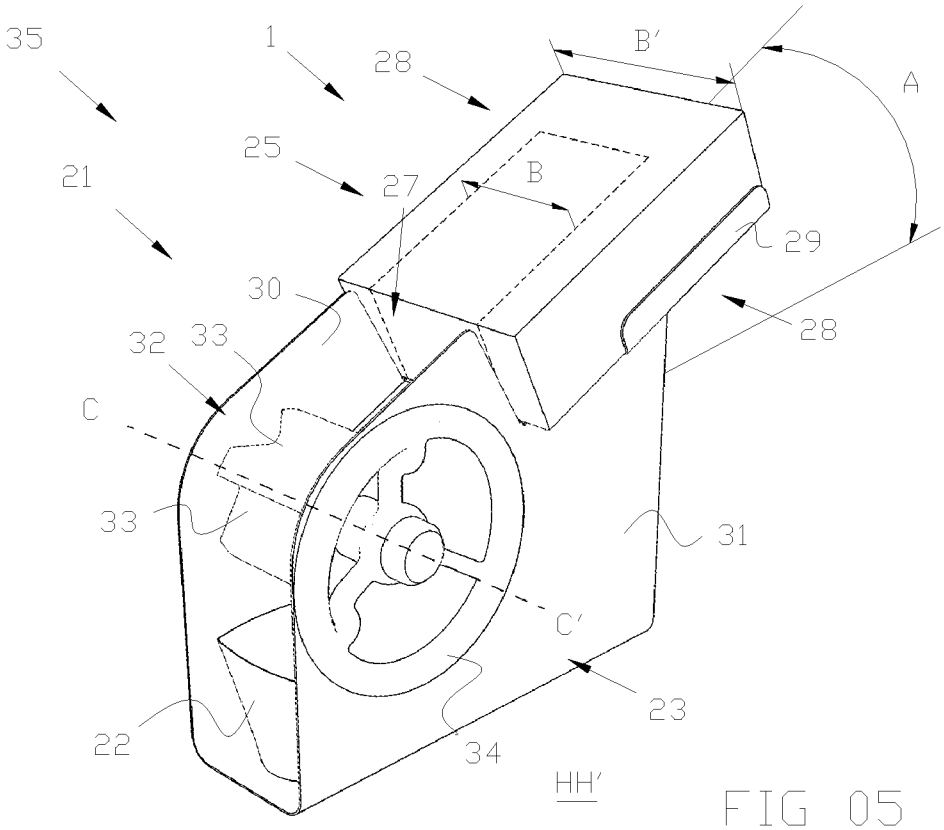
26
30
32
33
C
33
31
C'
23
22
34
HH'

FIG 04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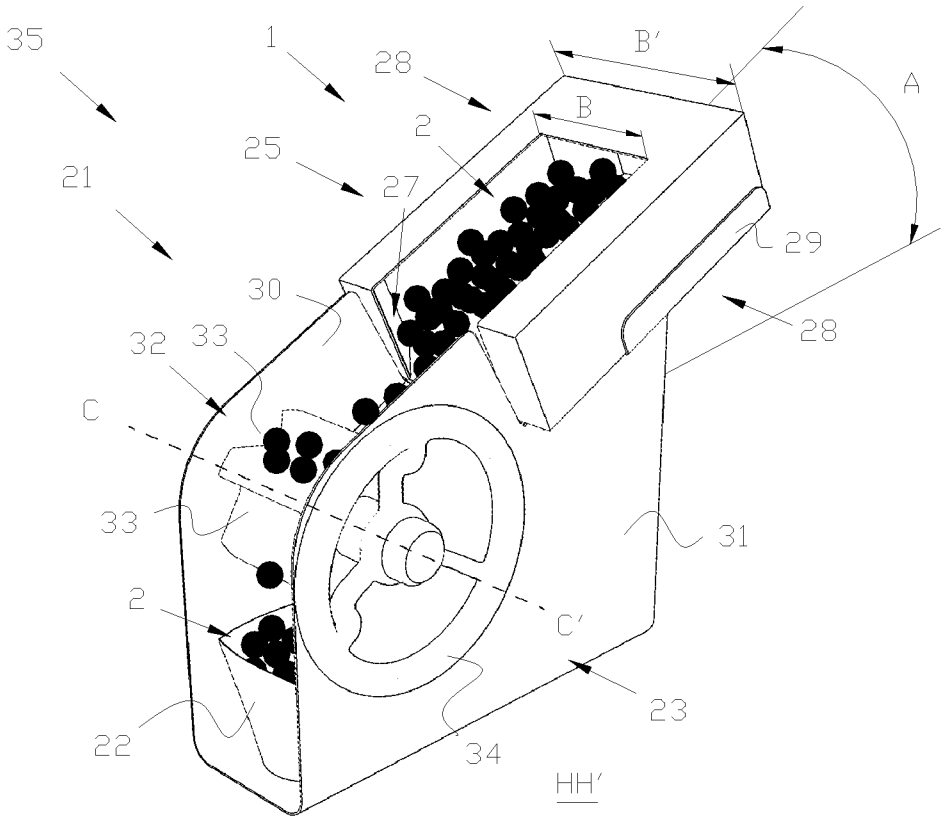
HH′

FIG 05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B′
A
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C′
23
22
34
HH′

FIG 06

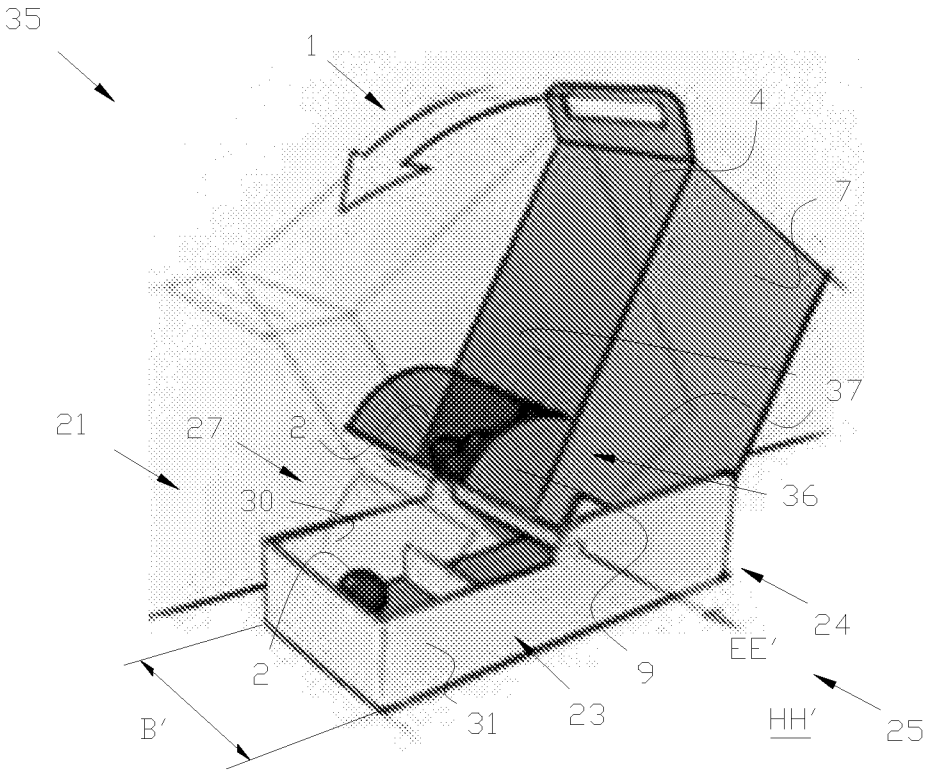
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FIG 07

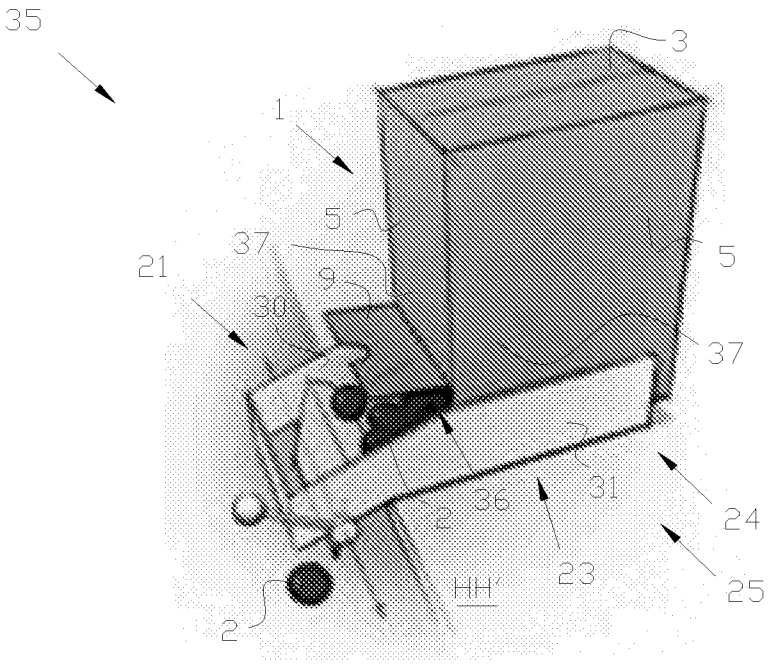
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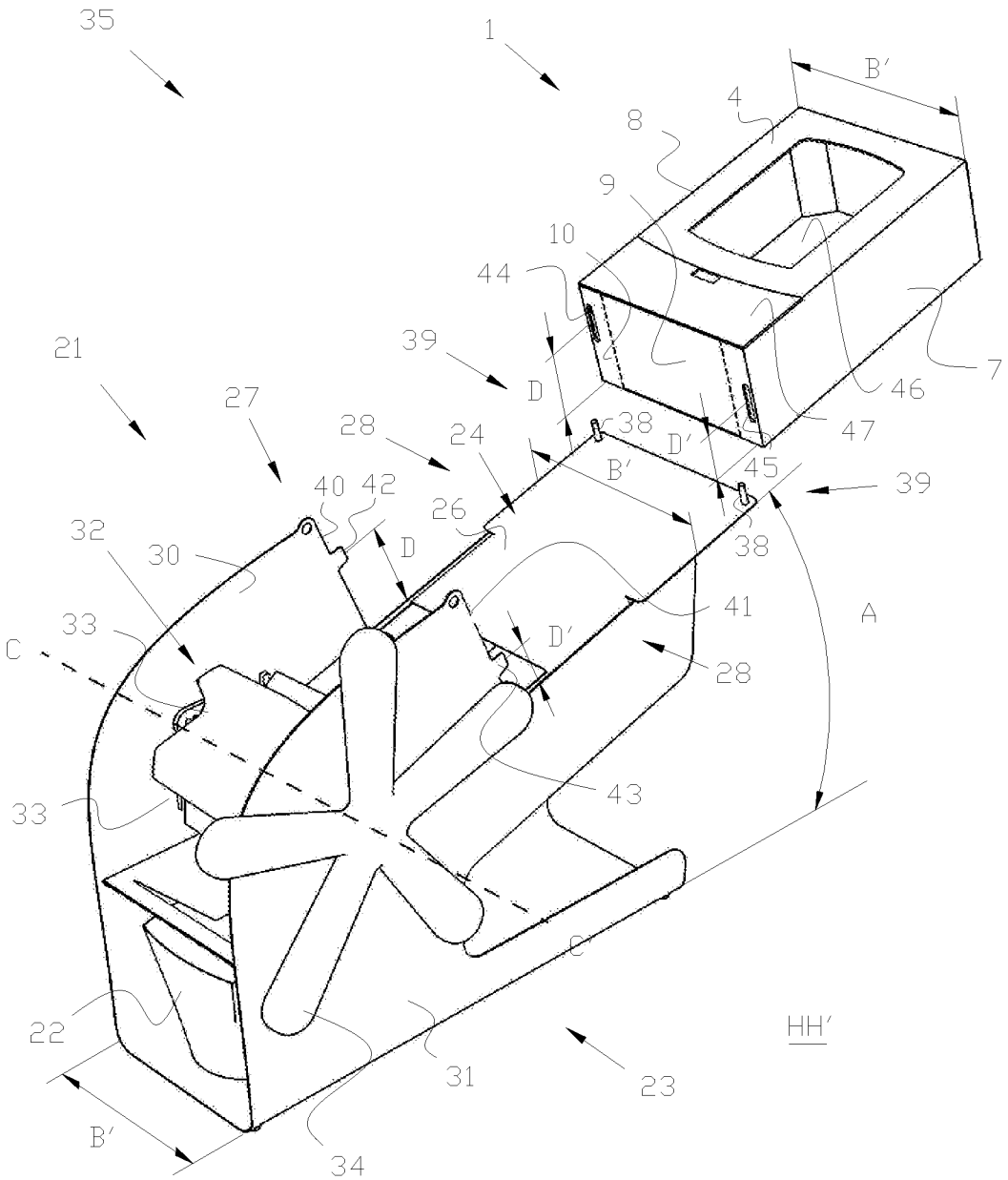
FIG 08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39
40
42
26
32
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D
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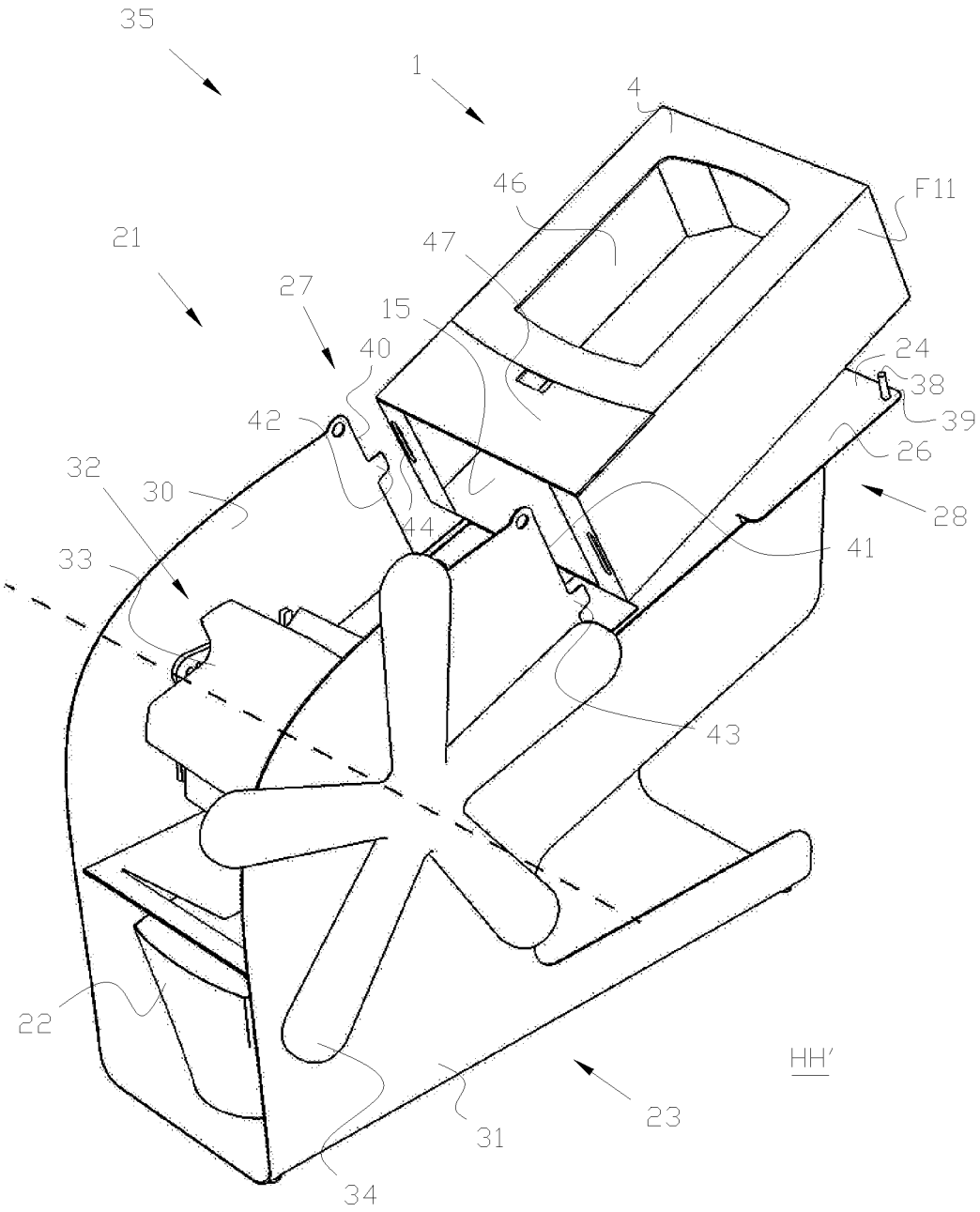
D′
28
43
33
C
22
HH′
31
23
B′
34

FIG 09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HH'
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31
34

FIG 10

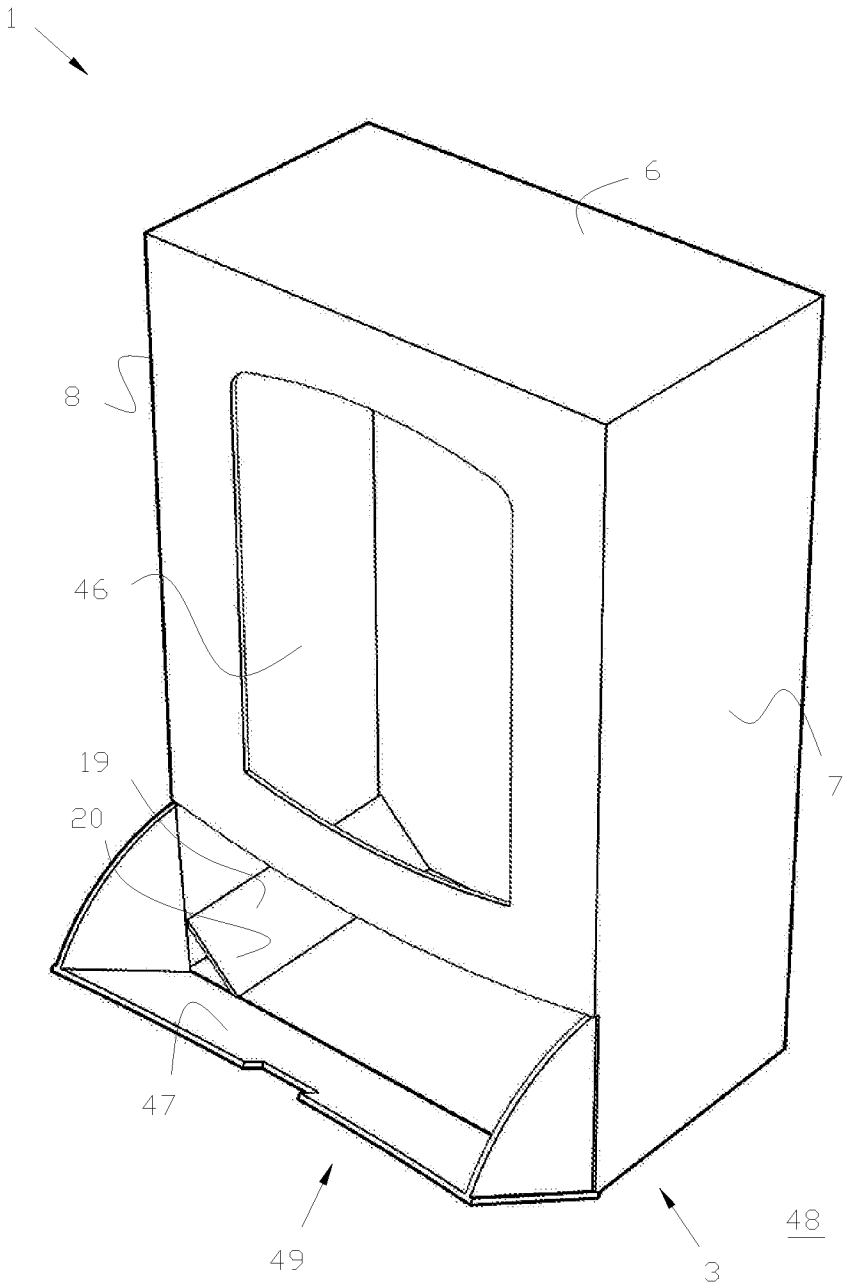

FIG 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2018/050623

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D5/72 B65D5/54 A47F1/03
ADD.

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)
B65D A47F A47J A47G G07F B65B

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 4 039 118 A (KAWAOKA TERU) 2 August 1977 (1977-08-02) column 2, line 15 - column 3, line 6; figures 1,1a,2	1-5
A	US 1 707 853 A (HABERMAN ANTON C) 2 April 1929 (1929-04-02) the whole document	1-5

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
23 April 2018	28/05/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Leijten, René

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2018/050623

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

International application No
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