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(54) **LOLLIPOP DISPENSING MACHINE AND CONTROLLED-ACCELERATION DISTRIBUTOR
DEVICE FOR SAID MACHINE**

(57) The invention relates to a lollipop dispensing machine. The inventive machine consists of a display container (10) comprising numerous vertical channels (11) which are defined radially by a tubular wall (15) in order to house lollipops (CP), said lollipops being stacked such that the head (C) is disposed lower than the stick (P) thereof. The aforementioned display container (10) is mounted such as to rotate on the seat (57) of a base (50). In this way, a selected channel (11) can be positioned above a hole (51) which opens into a distributor device (60) that is controlled by a coin-operated selector (62). Each of the channels (11) comprises a retaining element (17) which is disposed at the lower end (16) thereof and which can be moved, by means of a member (63) that projects out from the distributor device (60), from a hold position, in which the lollipops (CP) are held in the channel (11) without resting on the above-mentioned seat (57), to a release position, in which the lollipops (CP) can pass through the hole (51).

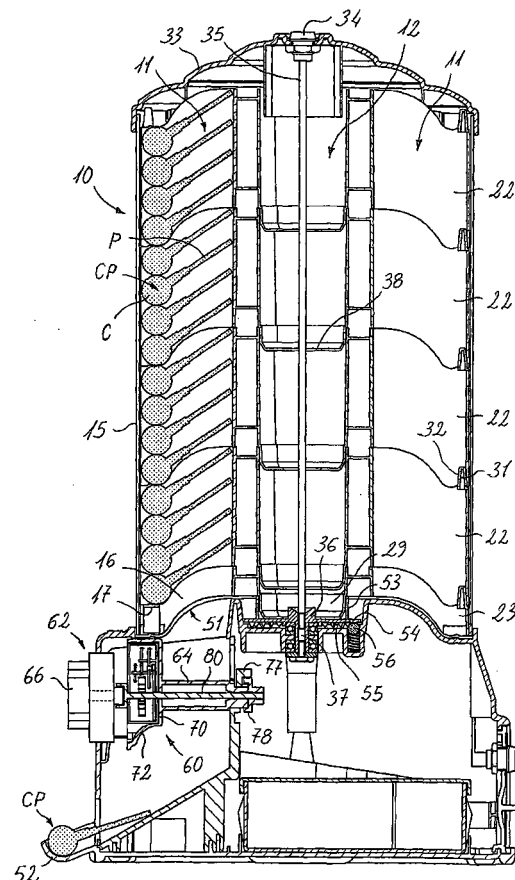


Fig. 1

Description

Field of the invention

[0001] This invention relates to a lollipop vending machine, and more particularly to a lollipop vending machine with a display container in which the lollipops are arranged in stacks forming columns, and which can be rotated to line up a lower end of one selected column of lollipops with the inlet of a dispensing device housed in a base body and controlled by a coin- or token-operated selector mechanism.

Technical background

[0002] In the state of the art a plurality of article distributor machines are known of the type comprising a display container in which the articles are arranged in piles or columns, a device for selecting a desired column of products and a dispensing device activated by the user after inserting a suitable coin or token in a coin- or token-operated selector mechanism. Examples of such machines can be found in Utility Models ES-A-1012270, ES-A-1021109 and ES-A-1040040, *inter alia*.

[0003] Patent FR-A-2745934 describes a machine comprising a display container mounted such as to rotate on a base body. Said display container is made up of various sections or superimposed areas, each one of which has a central core portion, a perimetrical tubular wall portion and a plurality of radial partitions arranged at regular intervals connecting at the ends thereof with the central core portion and with the perimetrical tubular wall portion, so that column portions are defined between them. The various sections are vertically superimposed and packed by a central rod passed through openings in the central core portions. Male-female co-operating elements lock the sections together in the rotation direction, so that the column portions of the superimposed sections coincide forming vertical columns in which the articles are stored in a pile, with the pile of articles resting on a lower support surface. The display container is linked to the base body by means of a rotary part associated with indexing means to enable a user to rotate the container dragging the articles over said support surface until one selected column lies over an inlet of a conventional dispensing device, of the type provided with a drum that has a cylindrical surface in which a cavity opens to house the article. This dispensing device is controlled by a conventional coin- or token-operated selector mechanism.

[0004] However, this machine is designed to handle regular shaped articles, such as cylindrical cans or spherical containers, and it is not suitable for irregular shaped articles, such as lollipops of the type comprising a substantially spherically shaped sweet head from which a stick protrudes, the head area usually being wrapped in paper or cellophane that extends down in twisted fashion onto part of the stick. Sweets of this type

are, for example, those marketed under the trade mark CHUPA-CHUPS®.

[0005] Spanish Utility Model ES-A-1045227, in the name of the current applicant, discloses a dispensing machine dedicated to the sale of lollipops in which the display container is made up of a plurality of vertical channels defined by walls in radial arrangement from a central core, the channel openings being opposite a cylindrical, transparent outside wall. Said channels form, together with said cylindrical wall, vertical columns in which the lollipops are stacked. Given their radial shape, the columns have a narrowed part, next to the central core, for receiving the lollipop sticks, and a widened part, next to the cylindrical wall, for housing the heads, so that the lollipops are stacked in each column with their heads resting on top of each other and the stick ends resting on the central core. Given that the depth of the channels is less than the total length of the lollipops, the head of each lollipop is disposed in a lower position than its own stick, which is tilted towards the centre and upwards. The head of the lollipop lying at the lowest level of the stack rests on a support surface of a base body on which the display container is rotationally mounted. A user can rotate the display container to selectively place one of the columns over an inlet opening in a dispensing device housed in said base body and controlled by a coin- or token-operated selector. During the rotation, the lollipop heads disposed at the lower level are dragged over said support surface. Said tilted arrangement of the lollipops favours their fall in to a discharge housing of a rotary cylindrical drum in the dispensing device, said discharge housing being specially adapted for handling lollipops.

[0006] International patent application WO 02/50786, also in the name of the current applicant, describes a lollipop vending machine that is a development of the previous utility model. The improvements consist in the construction of the channels, which are formed from a series of star-shaped elements that are stacked and connected together mechanically in releasable fashion, each element comprising a central core part from which a plurality of radial arms extend, with a portion of vertical channel being defined between every two arms, which is suitable for housing a single lollipop. This arrangement allows a loading procedure to be applied, which is also claimed in said patent, wherein the empty elements are replaced individually by full elements. The patent also includes the incorporation of two cavities in the dispensing device drum for the delivery of two lollipops with one single turn of the coin- or token-operated selector.

[0007] Patent US-B-6.378.724 describes a machine with a similar structure to that referenced in the two last background examples, although the display container is moved by means of a flywheel associated to a coin-operated selector device, thus providing relatively complex actuating means and including a mechanism for inserting the lollipops into the ducts to unload them one by one.

[0008] Both the machine in Utility Model ES-A-

1045227 and the one in patent application WO 02/50786 and patent US-B-6.378.724 suffer from the drawback that the paper or cellophane and the actual lollipops may be worn, because the heads of the sweets are dragged repeatedly over the support surface (and because of the weight of the lollipop), creating lollipop dust that causes a hygiene problem, and which also, with humidity and the atmospheric temperature (that may be quite high), becomes sticky and may block or hinder the rotation of the display container. Another drawback observed with respect to the first two background examples is that the cylindrical drum of the dispensing device must be rotated at a certain speed so that there is time for the lollipop to enter the adapted housing. Given that it is the user who rotates the drum directly by means of a handle on the coin- or token-operated selector, the actuating speed will depend on each user, and if activated very quickly there may not be time for the lollipop to enter the housing.

[0009] An objective of this invention is to solve the prior drawbacks by providing a lollipop vending machine wherein the lollipop heads disposed at the lower level are not in contact with a support surface, and wherein the acceleration and rotation speed of the distributor selector drum are controlled independently of the selector handle actuating speed.

[0010] Another objective of this invention is to provide a dispensing device with controlled acceleration, that can be applied to a lollipop vending machine.

[0011] The invention also provides means for delivering the lollipops, one by one or two by two, which are structured far more simply than those described in the above background examples.

Brief description of the invention

[0012] The above-mentioned objectives are achieved, in accordance with this invention, by providing a lollipop vending machine, of the type comprising a display container with a plurality of vertical channels in radial arrangement with respect to a central core, defining narrow areas next to said central core to house the sticks of said lollipops, and widened areas opposite an outside tubular wall and delimited by same to house the lollipop heads, the lollipops being stacked in the channels in a tilted position, with their heads disposed lower than their sticks, the display container being mounted on a base body that can be rotated over a seat surface so as to selectively place a lower end of a selected one of the channels, over an inlet opening in said base body to a dispensing device controlled by a coin- or token-operated selector mechanism and provided with means for transferring at least one lollipop from the selected channel to a delivery cavity within the user's reach. The machine is characterised in that each channel includes, next to said lower end, a retaining element mounted such that it can be moved between a hold position, where it holds the lollipop placed at the bottom of the

pile in the channel without it resting on said seat surface, and a release position, wherein the lollipop is allowed to pass through the lower end and said inlet opening to the inside of the dispensing device, with said retaining element of the selected channel being moved between said hold position and said release position by at least one appendix linked to a mobile part of the dispensing device.

[0013] With this, the lollipop heads at the bottom of the column are supported by their respective retaining elements so that they do not rest on said seat surface, which prevents any wearing of the wrapping and the lollipop and solves the previous problems of hygiene and blockage.

[0014] Preferably, said mobile part of the dispensing device to which said appendix is linked is a dispensing shaft connected to an actuating shaft joined to a handle outside the selector mechanism, and this dispensing shaft is placed within the user's reach by means of a drop chute that leads directly to said delivery cavity. A rotary plate is attached to one part of the dispensing shaft inside said drop chute, and it has a cylindrical periphery surface that partially blocks the inlet opening to the dispensing device, and on which the, or more than one, appendix is attached. Following on from the appendix, or from each of them, said cylindrical surface includes a tilted lowered portion to allow a lollipop to pass and to direct it towards a narrowed lower part of said drop chute connected to said delivery cavity. In this way, a cylindrical drum with a cavity in its periphery surface adapted to receive and transfer a lollipop is not necessary.

[0015] This invention also provides a controlled-acceleration dispensing device, that is applicable to a lollipop vending machine according to this invention, said dispensing device being of the type that is controlled by a coin- or token-operated selector mechanism and comprising means for transferring at least one article from the selected channel to a delivery cavity within the user's reach, where said dispensing device transfer means consist of a dispensing shaft connected to an actuating shaft associated with a handle outside said selector mechanism. Such a controlled-acceleration dispensing device is characterised in that said dispensing shaft is joined to said actuating shaft by means of a rope or spring device, with retaining and triggering means being included to hold the dispensing device while said rope or spring device is tensed by the rotation of the actuating shaft, and to subsequently release the dispensing shaft to that it can then be rotated by the energy accumulated in the rope or spring device under conditions of controlled acceleration, which are independent of the speed of the actuating shaft, with said hold and subsequent release operations being carried out during one turn of the actuating shaft.

[0016] By means of this arrangement, the acceleration and speed in a given position of the dispensing device is substantially always the same irrespective of the

energy applied by the user to the handle on the coin- or token-operated selector mechanism. The features of the spring are selected according to the requirements of the machine so that said acceleration and speeds are those required for dispensing the article in question.

Brief description of the drawings

[0017] These and other characteristics and advantages will be more comprehensible from the following description of an embodiment example with reference to the attached drawings, in which:

Fig. 1 is a side sectional view of the lollipop vending machine according to this invention;

Fig. 2 is a side sectional view of a lower star-shaped body which, together with other star-shaped bodies, form channels in the machine in Fig. 1, and which body is provided with retaining elements;

Fig. 3 is a top plane view of the star-shaped body in Fig. 1;

Fig. 4 is a side elevation view of the display container of the machine in Fig. 1 separated from the base body;

Fig. 5 is a partial front view of the dispensing device before moving the retaining element of a selected channel;

Fig. 6 is a partial front view of the dispensing device when the retaining element of the selected channel is moved;

Fig. 7 is a partially sectioned partial front view of the dispensing device with a rotary plate provided with two appendices and two tilted surfaces, and showing the inside of the rope or spring device;

Fig. 8 is a partially sectioned partial front view of the dispensing device with a rotary plate provided with a single appendix and two inclined surfaces, one of them covered with an insertable piece, and showing the outside of the rope or spring device;

Fig. 9 is a partial view in cross-section showing the dispensing device, the coin- or token-operated selector mechanism, the rope or spring device and the hold and trigger means;

Fig. 10 is a view of the rear part of the dispensing device showing the hold and trigger means;

Fig. 11 is a top view of the dispensing device showing the hold and trigger means and the coin- or token-operated selector mechanism;

Fig. 12 is an exploded perspective view of the catch on the hold and trigger means;

Fig. 13 is a perspective view of a loading accessory useful for loading the channels of the display container in the machine in Fig. 1 with lollipops; and

Figs. 14 and 15 are perspective views showing two different moments in a channel loading operation using the accessory in Fig. 13.

Detailed description of an exemplary embodiment

[0018] First of all, with reference to Fig. 1, the lollipop vending machine according to this invention comprises a display container 10 with a plurality of vertical channels 11 in radial arrangement with respect to a central core 12. Said vertical channels 11 define narrowed areas 13 next to said central core 12 for housing the sticks P of said lollipops CP and widened areas 14, opposite to and delimited by a tubular exterior wall 15, for housing the heads C of the lollipops CP. The depth of the channels 11 is less than the length of the lollipops CP, whereby said lollipops are stacked in channels 11 in a tilted position, with their heads C disposed lower than their sticks P. Display container 10 is mounted on a base body 50 with a lower polygon-sectioned protrusion 29 of said central core 12 nestled in a complementary upper polygon-sectioned cavity 53 of a positioning part 54 mounted such that it rotates on base body 50. Said positioning part 54 is provided on the bottom with teething 55 to which an elastically loaded ball is attached 56, constituting indexing means. The top part of display container 10 is closed by a cover 33 that includes a lock 34 that controls the rotation of a central rod 35 joined to a removable portion of said lock 34 and that has a lower threaded end 36 that threads into a threaded hole 37 on the centre of a conical concave surface of said positioning part 54. Said central rod 35 passes through a central opening 38 in central core 12. The display container ensemble can be rotated by a user over a seat surface 57 of base body 50 so as to selectively place one lower end 16 of one selected channel 11, over an opening 51 in said base body 50. This opening 51 communicates with an inlet to a dispensing device 60 that is controlled by a coin- or token-operated selector mechanism 62 and has means for transferring at least one lollipop CP from selected channel 11 to a delivery cavity 52 within the user's reach. A coin or token collection duct (not shown) leads to a drawer 58 accessible from a rear position 59 provided with a lock.

[0019] Each of the channels 11 includes, next to said lower end 16, a retaining element 17 mounted so that it can be moved between a hold position, in which it holds the lollipop CP placed at the bottom of the pile in channel 11, without it resting on said seat surface 57, and a release position, in which it allows the lollipop CP to pass through the lower end 16 and said opening 51 towards the inside of dispensing device 60.

[0020] As shown in Figs. 5 and 6, retaining element 17 is mounted in pivoting fashion with respect to a shaft 18 located on one side 19 of said widened area 14 of the respective channel 11 in a radial position with respect to said tubular wall 15, and includes at least one support tab 20 and at least one actuating leg 21. When retaining element 17 is in the hold position (Fig. 5), said support tab 20 extends transversally from said side 19 towards the inside of channel 11 at a higher level than shaft 18, while said actuating leg 21 is in a position that

projects downwards from the level of shaft 18. When retaining element 17 is in the release position (Fig. 6), support tab 20 is hidden in said side 19 of channel 11 while actuating leg 21 lies in the trajectory of lollipop CP that falls through lower end 16 of channel 11. Therefore, the actual falling lollipop makes contact with the actuating leg 21 and returns retaining element 17 to the hold position to hold the next lollipop CP. Retaining element 17 is maintained naturally in the hold position by virtue of its assembly conditions and the position of its centre of mass with respect to shaft 18. Actuating leg 21 of retaining element 17 belonging to the selected channel 11 is positioned, when retaining element 17 is in the hold position shown in Fig. 5, in the trajectory of an appendix 63 linked to a mobile part of dispensing device 60, so that said appendix 63, when dispensing device 60 is rotated, moves retaining element 17 to said release position, as shown in Fig. 6.

[0021] Said a plurality of vertical channels 11 in radial arrangement with respect to a central core 12 can be formed by an integral body (not shown) which is star-shaped in cross-section, attached internally to said tubular wall 15 and provided with retaining elements 17 in areas next to lower ends 16 of channels 11. However, and as shown in Fig. 1, for manufacturing ease and assembly convenience, said a plurality of vertical channels 11 are made up of several superimposed bodies 22, 23 star-shaped in cross-section, which can all be equal except one star-shaped lower body 23 attached internally to said tubular wall 15 and provided with retaining elements 17 in areas next to lower ends 16 of channels 11. Figs. 2 and 3 show said lower star-shaped body 23, although some of its characteristics are common to the other star-shaped bodies 22. Therefore, cross-sectional star-shaped bodies 22, 23 include a central core part 12a from which a plurality of radial arms 24 extend which, between them, define channel portions 11a. Said central core part 12a includes a lower polygon-sectioned protrusion 29 and a complementary upper polygon-sectioned cavity 30, and radial arms 24 include at the ends thereof upper projections 31 and complementary lower holes 32, with said lower protrusion 29 cooperating in said upper cavity 30 and said upper projections 31 in said lower holes 32 when two star-shaped bodies 22, 23 are superimposed on one another. Obviously, star-shaped body 23 need not be provided with lower holes 32, and star-shaped body 22 placed at the upper level need not be provided with upper projections 31.

[0022] As shown in Fig. 3, lower star-shaped body 23 includes a ring 25 that connects the ends of radial arms 24 and shoulders 26 extending outwards from said ring 25. Radial arms 24 include respective shafts 18 for mounting the corresponding retaining elements 17 and a notch 28 on the lower part to allow appendix 63 to pass. Lower star-shaped body 23 is attached to a lower end of said tubular wall 15 by the outside perimeter of ring 25 and with said shoulders 26 inserted in notches

in tubular wall 15. Thus, all the remaining star-shaped elements 22 are attached in a co-operative manner to lower star-shaped body 23 which is attached internally to tubular wall 15, whereby display container 10 made up of tubular wall 15 and cross-sectional star-shaped bodies 22, 23 forms a releasable unit, that can be withdrawn from base body 50 and transported with vertical channels 11 partially or completely loaded with lollipops CP held therein by retaining elements 17, as shown in Fig. 4. Advantageously, the machine includes a handle like accessory 39 that can be connected to said unit, for example, by means of hook shaped elements not shown, to facilitate its transport. Preferably, although it is not essential, said tubular wall 15 is cylindrical and partially or completely transparent.

[0023] Dispensing device 60 is described below with reference to Figs. 7 to 11. As shown better in Fig. 9, dispensing device 60 includes a dispensing shaft 64 that extends through a drop chute 67, which has an open top part 68 located below opening 51 and a reducing lower part 69 tilted towards said delivery cavity 52, appendix 63 being attached to a part of said dispensing shaft 64 arranged inside said drop chute 67. Dispensing shaft 64 is connected to an actuating shaft 65 that is rotated by a user by means of an outside handle 66 on said selector mechanism 62, after inserting one or more suitable coins or tokens.

[0024] Preferably, appendix 63 is attached to the periphery of a cylindrical surface 71 of a rotary plate 70 that is integral with said part of dispensing shaft 64. Normally said cylindrical surface 71 blocks, at least partially, opening 51 (Fig. 1), which is why a depressed tilted portion 72 is provided on said cylindrical surface 71, following on from appendix 63, to allow a lollipop CP to pass and to direct it towards said lower reducing part 69 of said drop chute 67.

[0025] In some cases it would be desirable that the machine delivered two or more lollipops CP with one actuating turn of selector mechanism 62. Therefore, Fig. 7 illustrates a dispensing device 60 that includes a second appendix 73 attached to the periphery of cylindrical surface 71, said rotary plate 70 and a second depressed tilted surface 74 on cylindrical surface 71 to transfer at least a second lollipop CP from selected channel 11 to delivery cavity 52 during one turn of dispensing shaft 64. For those cases where it would be desirable to adapt the rotary plate in Fig. 7 for a machine dispensing one single lollipop CP every time the selector 62 is activated, at least said second appendix 73 is removably attached so that it can be withdrawn, and a cover element 75 is provided to be attached to said second depressed tilted surface 74, said cover element having an outside surface that provides continuity to cylindrical surface 71 in that area. Therefore, dispensing device 60 works only with first appendix 63 and first depressed tilted surface 72.

[0026] The figures show a rope or string device 76 that is used as a coupling between dispensing shaft 64 and

said actuating shaft 65, including hold and trigger means 77, 78 for holding dispensing shaft 64 while said rope or spring device 76 is tensed by the rotation of actuating shaft 65 and to then release dispensing shaft 64 so that it can then be rotated by the energy accumulated in rope or spring device 76 under conditions of controlled acceleration, irrespective of the speed of actuating shaft 65. Said hold and trigger means 77, 78 carry out said holding and subsequent releasing operations during one turn of actuating shaft 65.

[0027] It must be noted that not only is said rope or spring device 76 applicable to the afore-mentioned machine, but also to any dispensing machine in which it is desirable or necessary that the conditions of acceleration and speed in the movement of the distributor body are independent, for example the typical cylindrical drum with one or more housings for the articles to be distributed, the speed generated by the user in actuating the coin- or token-operated selector mechanism.

[0028] Returning to Figs. 9 to 12, rope or spring device 76 includes a housing 79 through which a spring shaft 80 extends, and a flexing coiled spring 81 mounted inside said housing 79 with one end attached to housing 79 and the other end attached to said spring shaft 80. Dispensing shaft 64 is hollow and housing 79 is housed and attached in a cavity of rotary plate 70 with a part of spring shaft 80 inserted inside dispensing shaft 64 so that the end of said part of spring shaft 80 protrudes through an open end of dispensing shaft 64. The other opposite end of spring shaft 80 is coupled to an inside end of actuating shaft 65 by means of a polygonal male-female coupling 82.

[0029] Hold and trigger means 77, 78 include a catch 77, which is better illustrated, separately, in Fig. 12, with a pawl 83 and a cam follower 84, said catch 77 being mounted such that it can pivot with respect to a pin 85 (Fig. 10) duly supported on a rear wall of drop chute 67. Catch 77 is elastically loaded by a spring 86 such that said pawl 83 is pushed so that it locks in a notch 87 formed in an outer surface of dispensing shaft 64, next to said open end, preventing its rotation, while said cam follower 84 rests on a cam surface 78 of a cam 88 attached to said protruding end of spring shaft 80. Said cam surface 78 includes a protrusion 91 for making catch 77 pivot against the force of said spring 86 and consequently unlocking pawl 83 from said notch 87 by releasing the rotation of dispensing shaft 64. As shown in Figs. 7 and 11, rope or spring device 76 includes an inertia flywheel 89 mounted inside said housing 79 and linked to spring shaft 80 by means of a multiplying gear train 90.

[0030] The machine according to this invention includes a loading accessory 40, the characteristics and operation of which are described below with reference to Figs. 13 to 15. Said loading accessory 40 is made up of a tubular body 41 (Fig. 13), which is substantially cylindrical and is longer than the height of vertical channels 11 and has a slightly smaller interior diameter than the

average diameter of heads C of lollipops CP. Said tubular body is made from a slightly elastic material and has a longitudinal groove 42 which has in at least one of its ends a funnel portion 43 of increasing width connected to the open end of tubular body 41. Said loading accessory 40 works as follows: first of all tubular body 41 is filled with lollipops CP via said funnel portion 43, 44 of which there is at least one, leaving heads C held by elastic pressure inside the tubular body and sticks P protruding through said longitudinal groove 42, (Fig. 13); subsequently the full tubular body 41 is inserted as far as the bottom of one of the vertical channels 11 (Fig. 14); and finally, the tubular body is withdrawn from vertical channel 11 while the lollipop CP at the top is held so that all lollipops CP are stacked inside vertical channel 11 (Fig. 15). It is important to indicate that tubular body 41 is useful for filling only one part of a channel 11 or for completing the filling of one partially full channel 11, and, by applying the preceding operations in reverse order, tubular body 41 can also be used to empty all or some of lollipops CP from a completely or partially filled vertical channel 11.

[0031] The preceding description of an embodiment is merely illustrative and non-limiting of the scope of this invention, which is defined by the attached claims.

Claims

1. Lollipop vending machine, of the type comprising a display container (10) with a plurality of vertical channels (11) in radial arrangement with respect to a central core (12) defining narrowed areas (13) next to said central core (12) for housing the sticks (P) of said lollipops (CP) and widened areas (14) facing to and delimited by an exterior tubular wall (15) for housing the heads (C) of lollipops (CP), with lollipops (CP) being stacked in channels (11) in a tilted position, their heads (C) being disposed lower than their sticks (P), display container (10) being mounted on a base body (50) with the possibility of being rotated on a seat surface (57) so as to selectively place a lower end (16) of one selected channel (11) over an inlet opening (51) in said base body (50) to a dispensing device (60) controlled by a coin- or token-operated selector mechanism (62) and provided with means for transferring at least one lollipop (CP) from channel (11) to a delivery cavity (52) within the user's reach, **characterised in that** each of the channels (11) has, next to said lower end (16), a retaining element (17) mounted so that it can be moved between a hold position, in which it retains the lollipop (CP) located at the bottom of the pile in channel (11) without it resting on said seat surface (57), and a release position, in which it allows the lollipop (CP) located at the bottom of the pile to pass through lower end (16) and said inlet opening (51) to inside dispensing device (60), said retaining ele-

ment (17) of selected channel (11) being moved from said hold position to said release position by at least one appendix (63) linked to a mobile part of dispensing device (60).

2. Machine, according to claim 1, **characterised in that** retaining element (17) is mounted in pivoting fashion with respect to a shaft (18) located in one side (19) of said widened area (14) of the respective channel (11) in a radial position with respect to said tubular wall (15), and includes at least one support tab (20) and at least one actuating leg (21). 5
3. Machine, according to claim 2, **characterised in that**, when retaining element (17) is in the hold position, said support tab (20) extends transversally from said side (19) towards the inside of channel (11) at a higher level than shaft (18) while said actuating leg (21) is in a position that protrudes downwards from the level of shaft (18); and, when retaining element (17) is in the release position, support tab (20) is hidden in said side (19) of channel (11) while actuating leg (21) lies in the trajectory of the lollipop (CP) that falls through lower end (16) of channel (11). 10
4. Machine, according to claim 3, **characterised in that** retaining element (17) is maintained naturally in the hold position by virtue of its assembly conditions and the position of its centre of mass with respect to shaft (18). 15
5. Machine, according to claim 3, **characterised in that** actuating leg (21) of selected channel (11) is in the trajectory of said at least one appendix (63) when retaining element (17) is in the hold position. 20
6. Machine, according to claim 5, **characterised in that** dispensing device (60) includes a dispensing shaft (64) that extends through a drop chute (67) having an open top part (68) located beneath opening (51) and a lower reducing part (69) tilted towards said delivery cavity (52), with the at least one appendix (63) being attached to one part of said dispensing shaft (64) arranged inside said drop chute (67) and said dispensing shaft (64) being connected to an actuating shaft (65) that is rotated by an outside handle (66) on said selector mechanism (62). 25
7. Machine, according to claim 6, **characterised in that** the at least one appendix (63) is attached to the periphery of a cylindrical surface (71) of a rotary plate (70) that is integral with said part of dispensing shaft (64), with said cylindrical surface (71) blocking at least partially the opening (51), a depressed tilted portion (72) being provided on said cylindrical surface (71), continuing on from appendix (63) to allow a lollipop (CP) to pass and to direct it towards said 30

lower reducing part (69) of said drop chute (67).

8. Machine, according to claim 7, **characterised in that** it comprises a second appendix (73) attached to the periphery of cylindrical surface (71) of said rotary plate (70) and a second depressed tilted surface (74) on cylindrical surface (71) for transferring at least a second lollipop (CP) from selected channel (11) to the delivery cavity (52) during one turn of dispensing shaft (64). 35
9. Machine, according to claim 8, **characterised in that** at least said second appendix (73) is removable and a cover element (75) is provided that is to be attached onto said second depressed tilted surface (74) and having an outside surface that provides continuity to cylindrical surface (71) in that area when dispensing device (60) is operated with only the first appendix (63). 40
10. Machine, according to claim 7, **characterised in that** said dispensing shaft (64) is connected to said actuating shaft (65) by means of a rope or spring device (76), with hold and trigger means (77, 78) being included to hold dispensing shaft (64) while said rope or spring device (76) is tensed by the rotation of actuating shaft (65) and to then release dispensing shaft (64) so that it can then be rotated by the energy accumulated in rope or spring device (76) under controlled acceleration conditions, independent of the speed of actuating shaft (65), said hold and subsequent release operations being carried out during one turn of actuating shaft (65). 45
11. Machine, according to claim 10, **characterised in that** said rope or spring device (76) includes a housing (79) through which there passes a spring shaft (80), and a flexing coiled spring (81) mounted inside said housing (79) with one end attached to housing (79) and the other end attached to said spring shaft (80), and in that dispensing shaft (64) is hollow and housing (79) is housed in and attached to a cavity in rotary plate (70) with one part of spring shaft (80) being inserted inside dispensing shaft (64), the end of said part of spring shaft (80) protruding through an open end of dispensing shaft (64) and an opposite end of spring shaft (80) being coupled to an inside end of actuating shaft (65) by means of a polygonal male-female coupling (82). 50
12. Machine, according to claim 11, **characterised in that** said hold and trigger means (77, 78) include a catch (77) with a pawl (83) and a cam follower (84), said catch (77) being mounted such that it can pivot with respect to a pin (85), duly supported, and elastically loaded by a spring (86) so that said pawl (83) is pushed to lock in a notch (87) formed in an outside surface of dispensing shaft (64) next to said open 55

end to prevent its rotation, and said cam follower (84) rests on a cam surface (78) of a cam (88) attached to said protruding end of spring shaft (80), said cam surface (78) including a protrusion (91) for making catch (77) pivot against the strength of said spring (86) and consequently unlocking pawl (83) from said notch (78) to release the rotation of dispensing shaft (64).

13. Machine, according to claim 12, **characterised in that** the rope or spring device (76) includes an inertia flywheel (89) mounted inside said housing (79) and linked to spring shaft (80) by means of a multiplying gear train (90).
14. Machine, according to claim 3, **characterised in that** said plurality of vertical channels (11) in radial arrangement with respect to a central core (12) is made up of several superimposed cross-sectional star-shaped bodies (22, 23), with a lower star-shaped body (23) being attached internally to said tubular wall (15) and having the retaining elements (17) in areas next to lower ends (16) of channels (11).
15. Machine, according to claim 14, **characterised in that** said cross-sectional star-shaped bodies (22, 23) include a central core portion (12a) from which a plurality of radial arms (24) extend, defining between them channel portions (11a), where said central core portion (12a) includes a lower protrusion (29) polygonal in cross-section and an upper cavity (30) complementary polygonal in cross-section, and radial arms (24) include at their ends upper projections (31) and lower holes (32) complementary in shape, with said lower protrusion (29) nesting in said upper cavity (30) and said upper protrusions (31) nesting in said lower holes (32) when two of the cross-sectional star-shaped bodies (22, 23) are superimposed.
16. Machine, according to claim 15, **characterised in that** the lower star-shaped body (23) includes a ring (25) connecting the ends of radial arms (24) and shoulders (26) protruding outward from said ring (25), the radial arms (24) including the respective shafts (18) for assembling corresponding retaining elements (17) and a notch (28) to allow the at least one appendix (63) to pass, said lower star-shaped body (23) being attached to a lower end of said tubular wall (15) at the outside perimeter of ring (25) and with said shoulders (26) inserted in notches in tubular wall (15).
17. Machine, according to claim 3, **characterised in that** said a plurality of vertical channels (11) in radial arrangement with respect to a central core (12) are made up of an integral cross-sectional star-shaped

body attached internally to said tubular wall (15) and having the retaining elements (17) in areas near to lower ends (16) of channels (11).

18. Machine, according to claim 14 or 17, **characterised in that** said display container (10), which is made up of tubular wall (15) and one or more cross-sectional star-shaped bodies (22, 23) forming the plurality of vertical channels (11), constitutes a releasable unit that can be removed from base body (50) and transported with vertical channels (11) partially or completely loaded with lollipops (CP) held therein by the retaining elements (17).
19. Machine, according to claim 18, **characterised in that** it includes a handle like accessory (39) that can be connected to said unit to facilitate its transport.
20. Machine, according to claim 1, **characterised in that** display container (10) is mounted on the base body (50) with a lower polygonal-sectioned protrusion (29) of said central core (12) nestled in a complementary upper polygonal-sectioned cavity (53) of a positioning part (54) rotably mounted on base body (50) and provided in the lower part thereof with teeth (55) to which an elastically loaded ball (56) is engaged, with a cover (33) being provided that closes display container (10) at the top and which includes a lock (34) that controls the rotation of a central rod (35) linked to a removable part of said lock (34) and which has a threaded lower end (36) that threads into a threaded hole (37) provided in the centre of a conical concave surface of said positioning part (54), said rod passing through a central opening (38) in central core (12).
21. Machine, according to claim 1, **characterised in that** said tubular wall (15) is cylindrical and partially or totally transparent.
22. Machine, according to claim 1, **characterised in that** it includes a loading accessory (40) made up of a substantially cylindrical tubular body (41) that is longer than the height of vertical channels (11) and has an inner diameter that is slightly smaller than the average diameter of heads (C) of lollipops (CP), with said tubular body being made from slightly elastic material and having a longitudinal groove (42) which has at least at one of its ends a funnel portion (43) that increases in width until it connects with the open end of tubular body (41), said loading accessory (40) being able to be filled with lollipops (CP) via said at least one funnel portion (43, 44) leaving the heads (C) held by elastic pressure inside the tubular body and the sticks (P) protruding through said longitudinal groove (42); subsequently inserted when full into a vertical channel (11); and withdrawn from vertical channel (11) while the lollipops

pop (CP) that is at the top is held thus leaving all lollipops (CP) stacked inside the vertical channel (11).

23. Controlled-acceleration dispensing device, applicable to a lollipop vending machine according to claim 1, of the type controlled by a coin- or token-operated selector mechanism (62) and which includes means for transferring at least one article (CP) from selected channel (11) to a delivery cavity (52) within the user's reach, where said transfer means of dispensing device (60) include a dispensing shaft (64) associated with an actuating shaft (65) joined to an outside handle (66) of said selector mechanism (62), **characterised in that** said dispensing shaft (64) is joined to said actuating shaft (65) by means of a rope or spring device (76), with hold and trigger means (77, 78) being included to hold dispensing shaft (64) while said rope or spring device (76) is tensed by the rotation of actuating shaft (65) and to then release dispensing shaft (64) so that it can then be rotated by the energy accumulated in rope or spring device (76) under controlled acceleration conditions, independent of the speed of actuating shaft (65), said hold and subsequent release operations being carried out during one turn of actuating shaft (65).

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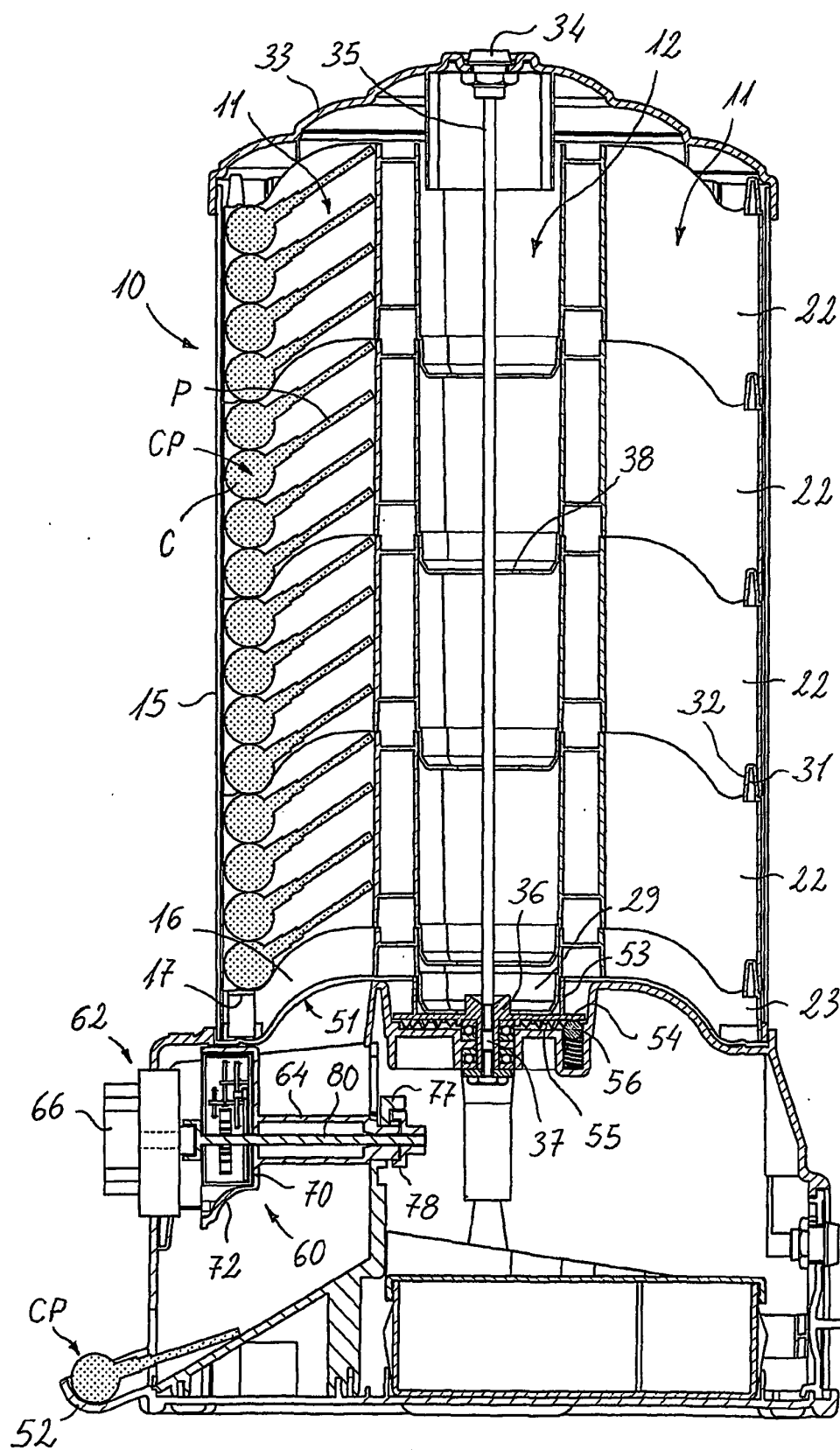


Fig. 1

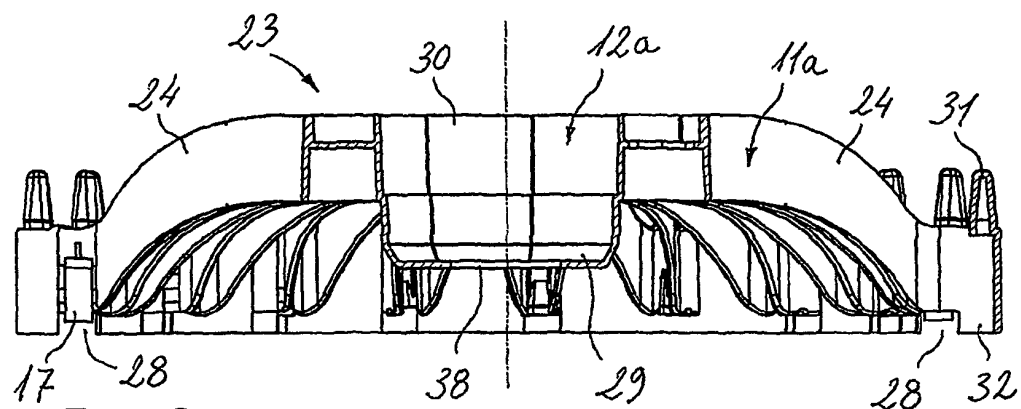


Fig.2

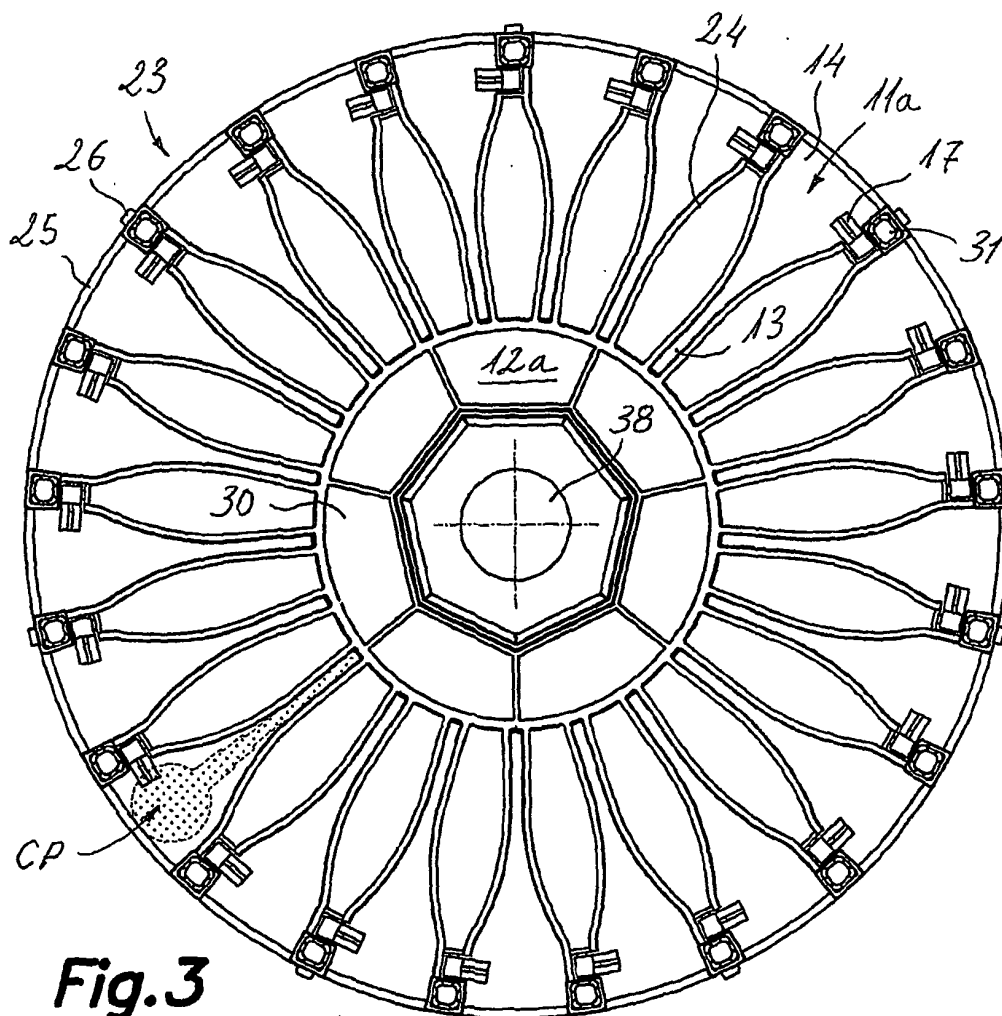
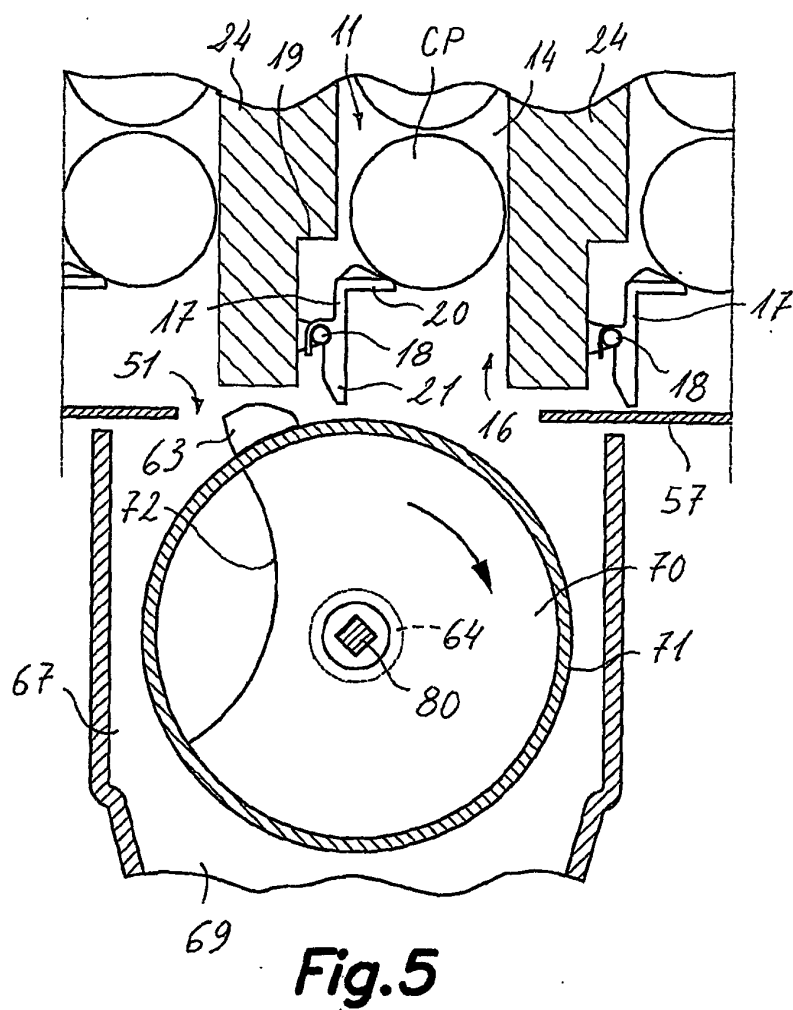
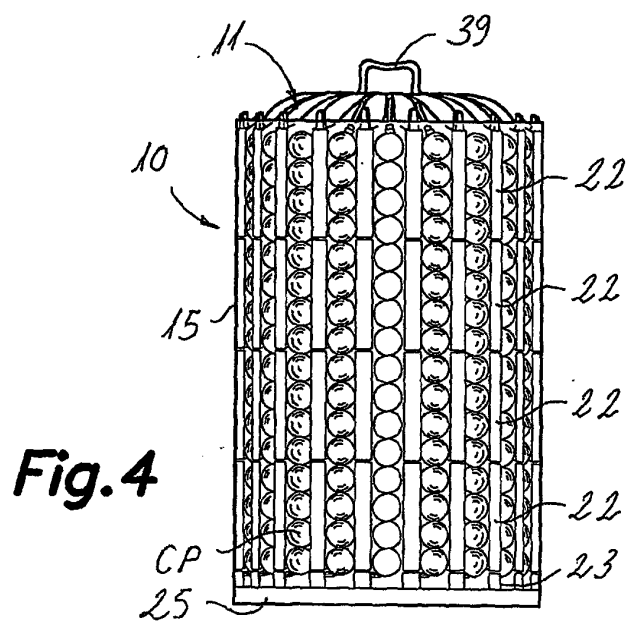


Fig.3



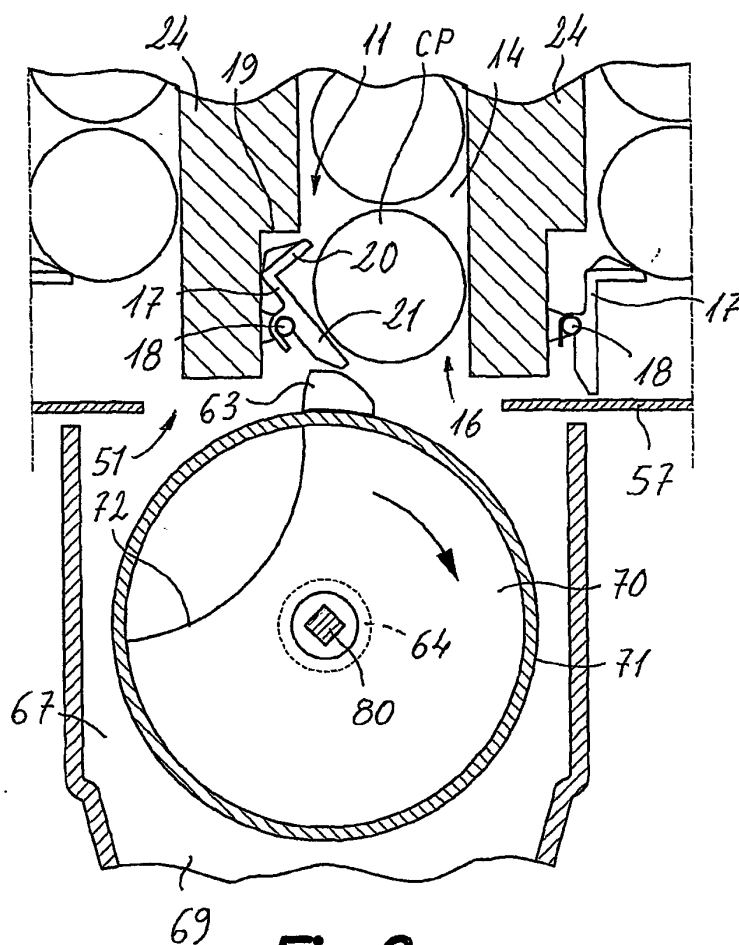


Fig. 6

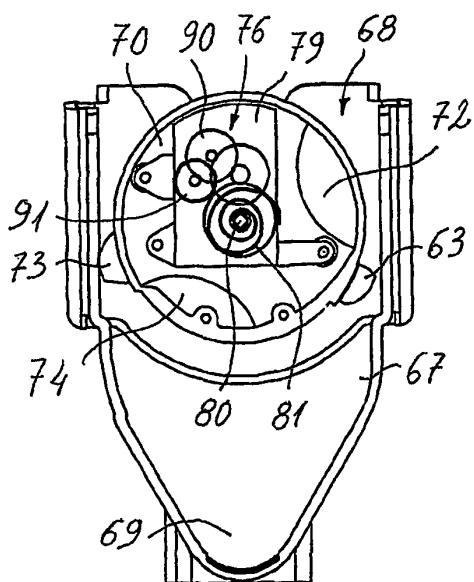


Fig. 7

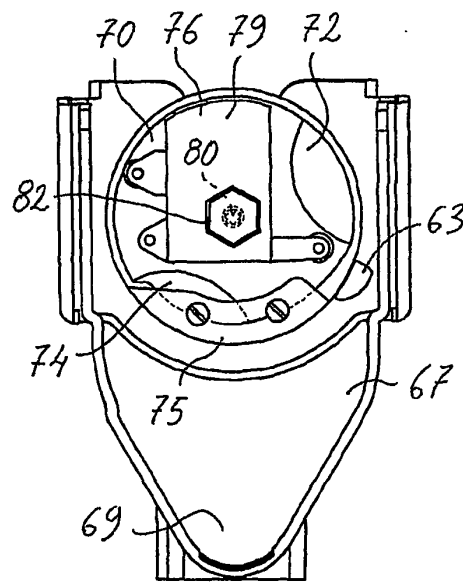


Fig. 8

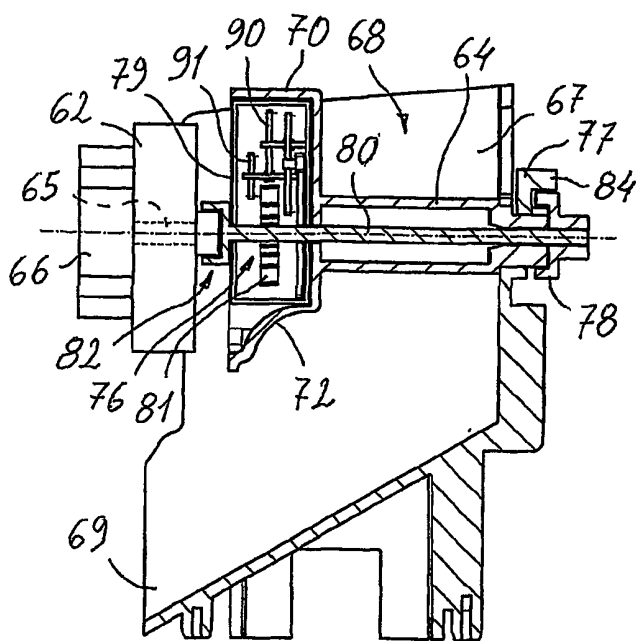


Fig. 9

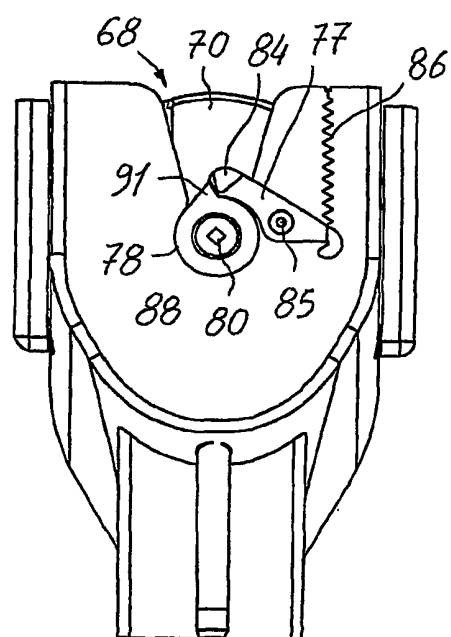


Fig. 10

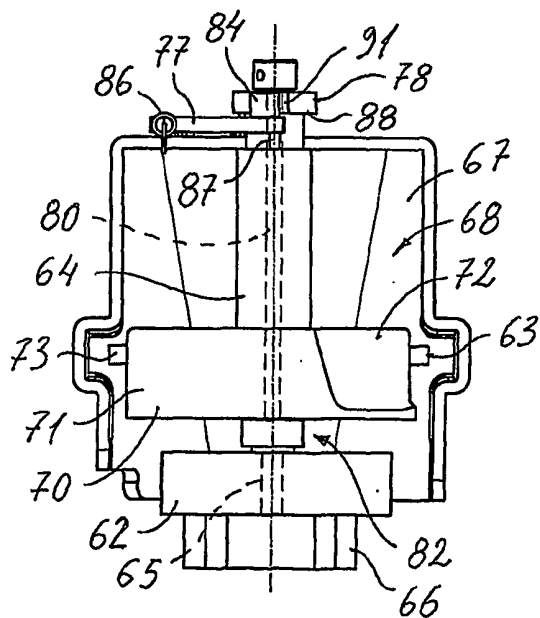


Fig. 11

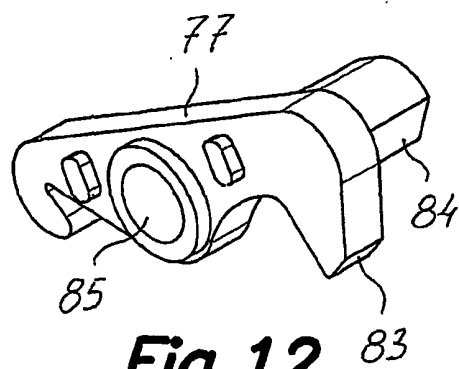
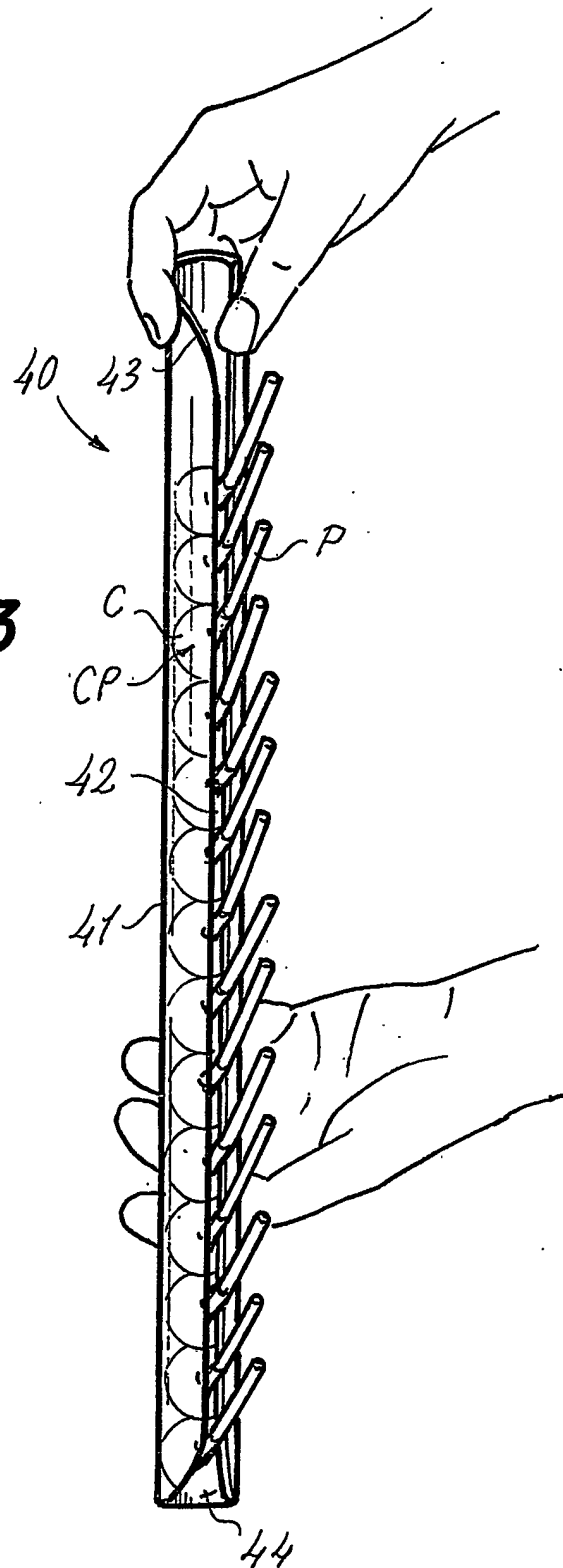
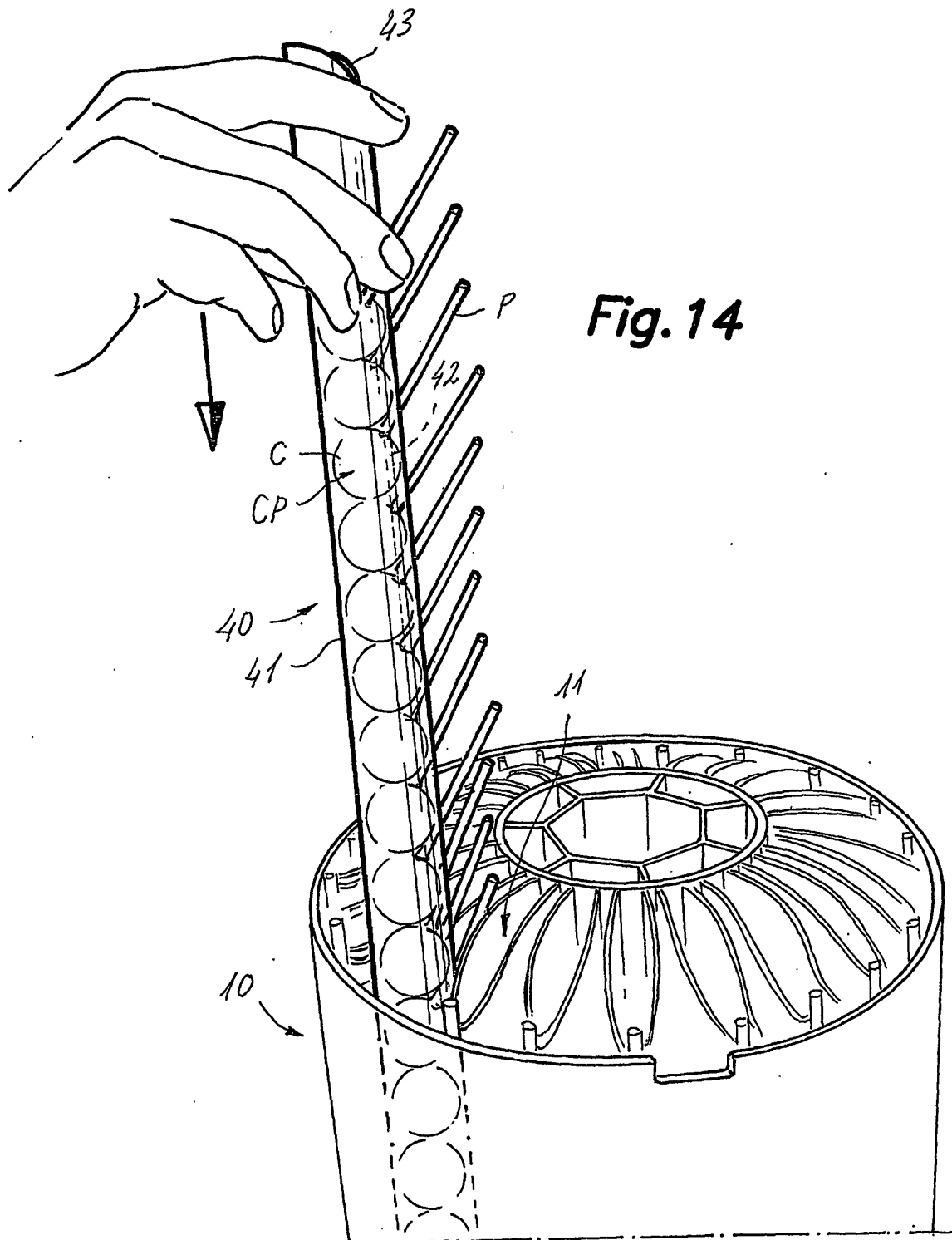
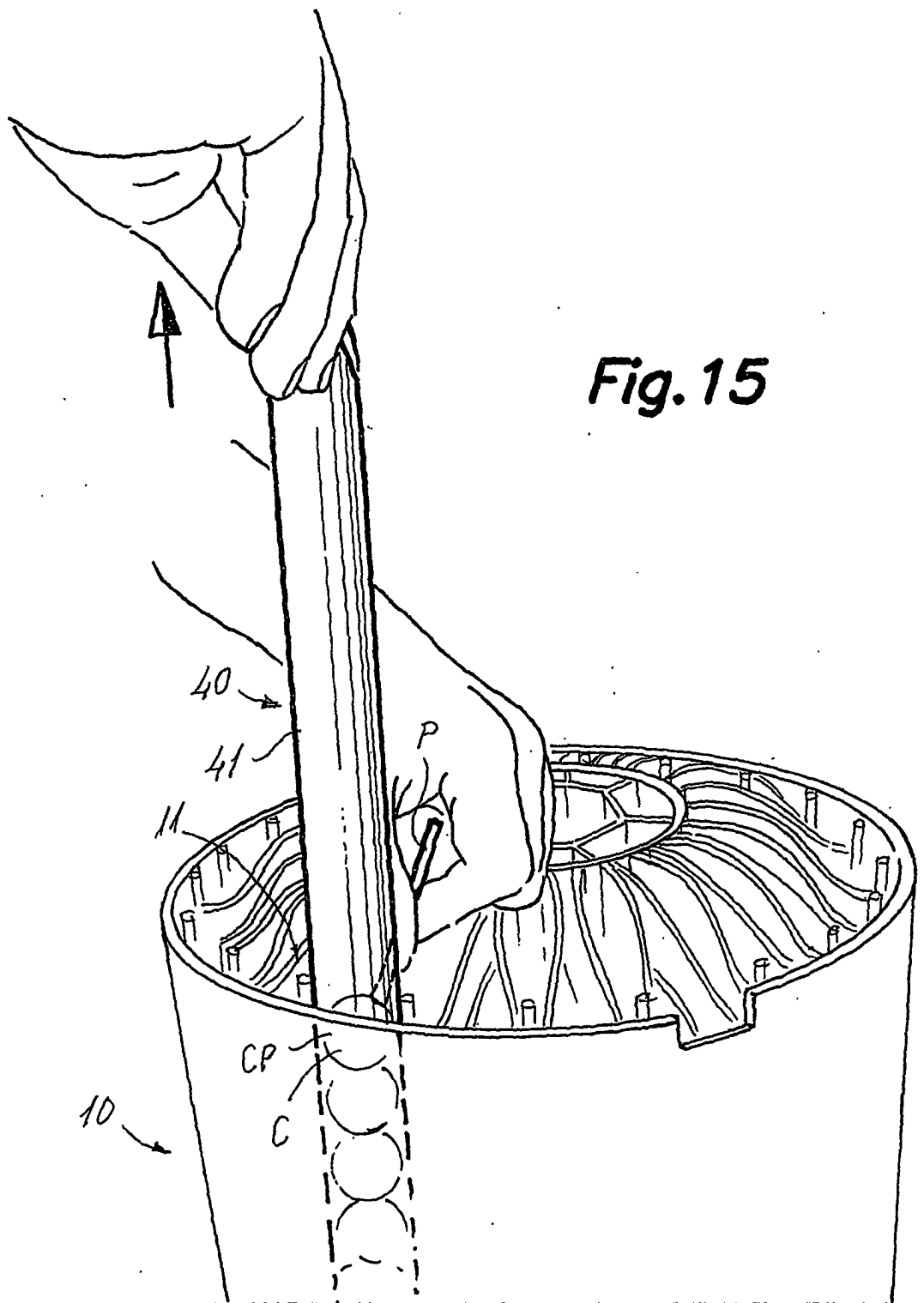


Fig. 12

Fig. 13







INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES02/00573

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7 G 07 F 11/24, 11/54		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 G 07 F		
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)		
EPODOC, WIPL, PAJ, CIBEPAT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Database Pai en Epoque, JP 7 160 943 A (SHIBAURA ENG WORKS) 23.06.1995, abstract & JP 7 160 943 A (SHIBAURA ENG WORKS) 23.06.1995, fig 1-3	1-4
A	ES 1 043 987 U (FACTA PRODS) 16.02.2000, the whole document	1-4
A	FR 1 498 297 A (HERNE) 20.10.1967, the whole document	1-4
A	US 4 429 806 A (SCHWARZLI) 07.02.1984, column 3, line 7 - column 4, line 16; figures 1-7	6
A	US 1 464 682 A (MORTISING MACHINE CO) 14.08.1923, the whole document	10-13
A	US 5 909 795 A (PORCO et al) 08.06.1999, column 4, line 17 - column 6, line 20; figures 1-3	10-13
A	ES 2 169 700(DISCAPA) 01.07.2002, the whole document	1, 6, 14-22
A	US 2 245 372 A (VAN TUYL) 10.06.1941, the whole document	14
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 26 February 2003 (26. 02. 2003)		Date of mailing of the international search report 04 March 2003 (04. 03. 2003)
Name and mailing address of the ISA/ S. P. T. O.		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ES02/00573

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ES 1 043 987 U	16.02.2000	NONE	17.01.2002
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US 4 429 806 A	07.02.1984	NONE	
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