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(54) **Anti-blocking mechanism of vending machines with cashbox**

(57) The object of the present invention is an anti-blocking mechanism of vending machines with cashbox which impedes the blocking of the drum of the machine in the moment of actuating the control of the cashbox when extracting a product due to the presence of a fixed element, external to the drum, which is traveled by a spindle which detains the rotation of the control of the cashbox and consequently of the drum, when a turn of the control

of the cashbox has been made at high speed and prevents the drum from being blocked by the product and wherein ceasing to apply pressure on the control allows the spindle to return to the initial position and the product finishes falling into the drum, it being possible to complete turning the control until the product is deposited in the collection area.

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Description**OBJECT OF THE INVENTION**

[0001] The object of the present invention is an anti-blocking mechanism of vending machines with cashbox which impedes the blocking of the machine drum in the moment of actuating the cashbox control when extracting a product.

[0002] The present invention is characterized in a fixed element, external to the drum, which is traveled by a spindle which stops the turning of the cashbox control and consequently of the drum, when a turn of the cashbox control has been made at high speed and prevents the drum from being blocked by the product.

[0003] Thus, ceasing for an instant to apply pressure on the control, the spindle is allowed to return to the initial position with respect to the fixed element, and at the same time, the product finishes falling into the drum, it being possible to complete turning the control until the product is deposited in the collection area.

BACKGROUND OF THE INVENTION

[0004] Vending machines with cashbox are very well known in the state of the art which allow, once a coin has been inserted, a control to be turned and a can or similar to be extracted from the same.

[0005] Among the preceding machines the Portuguese patent is found with publication number PT101787 referring to a modular device for display of articles and for their distribution with natural selection which has a receptacle wherein the products fall on rotating the cashbox control through 180° and wherein on being rotated through another 180°, the products are made to fall into a discharge tube of the same so that the user can collect them.

[0006] Likewise the Spanish patent is known with publication number ES2116942 referring to a delivery mechanism of cans and the like in vending machines with cashbox which comprises a revolving drum in the form of a tubular body which has an opening for the ingress of a can or the like inside a stationary piece, mounted concentrically to the drum.

[0007] In the previous mechanisms, if the turning of the cashbox control is carried out at high speed, it does not allow sufficient time for the can or the like to fall into the drum or receptacle, so that it is trapped by the actual drum or receptacle, blocking the machine in turn, since is not possible to unblock it by turning the control in the opposite direction.

[0008] All these drawbacks are overcome by means of the invention which is disclosed below.

DESCRIPTION OF THE INVENTION

[0009] The present invention relates to an anti-blocking mechanism of vending machines with cashbox which

impedes the blocking of the machine drum in the moment of actuating the control of the cashbox when extracting a product.

[0010] These vending machines have a hollow drum wherein the products fall on turning the control of the cashbox through 180°, and wherein on being turned through another 180°, the products are made to fall into a discharge tube of the same so that the user can collect them.

[0011] As has already been mentioned above, the problem exists that when the turning of the cashbox control is made at high speed, it does not give sufficient time for the product to fall into the drum since, by the effect of gravity, it is caught by the drum itself in its movement.

[0012] In that moment the machine is jammed, it being impossible to reverse the control to release the product.

[0013] In order to resolve this problem, the drum has on its external part an orifice to house a spindle diametrically to the drum.

[0014] External to said drum, but fixed to the casing where the latter is housed, there is a fixed piece with an interior profile which is traveled by the spindle on making the turn of the cashbox control.

[0015] This interior profile allows the spindle to turn through 180° around the orifice of the drum and return to its initial position by gravity, reproducing each of the two half-turns in which respectively, the product falls inside the drum, and later the drum allows the product to fall into the discharge tube so that the user can collect it.

[0016] As has already been commented, the spindle, in its initial position, is vertically supported in the lower part of the profile of the fixed piece, and the opening of the drum is located in its lower part.

[0017] When the cashbox control is operated, the drum rotates at the same time as the spindle travels the interior profile of the fixed piece, until it arrives at the upper vertical position and falls by gravity to the initial position to carry out the second half-turn, the opening of the drum being in its upper part and this being the normal operation.

[0018] If the turning of the cashbox control is carried out at high speed, the spindle comes up against an essentially vertical segment of the interior profile of the fixed piece.

[0019] If thereafter pressure ceases to be applied for an instant on the control the spindle is allowed to return to the initial position with respect to the fixed piece, and at the same time that the product finishes falling into the drum.

[0020] Next the second half-turn of the control is produced, the spindle making the turn and its fall by gravity to the initial position, at the same time as the product falls into the discharge area, since due to the rotation of the drum, its opening is in the lower position.

[0021] If this second half-turn is also carried out at high speed, the spindle again comes up against the essentially vertical segment of the interior profile of the fixed piece, but it is sufficient to release the control for the

spindle to return to the initial position, without this occurrence affecting the fall of the product into the discharge area.

DESCRIPTION OF THE DRAWINGS

[0022] The present descriptive specification is supplemented with a set of drawings, which illustrate the preferred embodiment of the invention in a non-restrictive manner.

[0023] Figure 1 shows a perspective of the anti-blocking mechanism of vending machines with cashbox object of the invention.

[0024] Figure 2 shows the position of the spindle inside the fixed piece in the lower or initial position, which also corresponds with the position of the spindle after turning the control through 180°.

[0025] Figure 3 shows the position of the spindle inside the fixed piece in an intermediate position.

[0026] Figure 4 shows the position of the spindle inside the fixed piece in the upper position just before falling by gravity to the initial position shown in figure 2.

[0027] Figure 5 shows the position of the spindle inside the fixed piece when coming up against the essentially vertical segment of the interior profile of the fixed piece.

PREFERRED EMBODIMENT OF THE INVENTION

[0028] In the light of the foregoing, the present invention relates to an anti-blocking mechanism of vending machines with cashbox which comprises a rotating drum (1) for collection of the product (4) wherein the blocking of the drum (1) is impeded by the product (4) itself when the latter falls by gravity through a reception opening (1.1) of said drum (1) on actuating the control (2) of the cashbox (3).

[0029] To such an end the drum (1) has on its external part a drilled hole (1.2) perpendicular to the axle of the drum wherein a spindle (5) is housed which can be displaced along the axis of the drilled hole (1.2), at the same time as it rotates together with the drum (1).

[0030] This spindle (5) is guided by an interior profile (6.1) of a fixed piece (6) located externally to the drum (1), and fixed to the casing (7) wherein the drum is also housed (1).

[0031] The spindle (5) which in its initial position is vertically supported on a bottom segment (6.1.1) of the interior profile (6.1) of the fixed piece (6), rotates through 180° about the diametrical drilled hole (1.2) by the effect of turning the control (2) of the cashbox (3) following the interior profile (6.1).

[0032] In that instant the spindle (5) returns by gravity to its initial position, the opening (1.1) of the drum (1) being in that instant in its upper part, whereby it is allowed that the product be already inside the drum (1).

[0033] On rotating the control (2) through another 180° the product (4) falls by gravity through a discharge tube so that the user can collect it, since the opening (1.1) of

the drum (1) is now in its lower part.

[0034] If the initial rotation of 180° of the control (2) is carried out at high speed, the spindle comes up against an essentially vertical segment (6.1.2) of the interior profile (6.1) of the fixed piece (6).

[0035] Next, pressure ceases for an instant to be applied on the control (2), with which the spindle by itself returns to rest on the lower segment (6.1.1) of the interior profile (6.1), allowing, due to that short interval of time that the product (4) finishes falling into the drum (1) and cannot be trapped by it (1).

[0036] The second half-turn of the control (2) is then carried out, the spindle (5) making the turn and falling by gravity to the initial position, at the same time as the product (4) falls into the discharge area.

[0037] If this second half-turn is also carried out at high speed, the spindle (5) again comes up against the essentially vertical segment (6.1.1) of the interior profile (6.1) of the fixed piece (6), but it suffices to release the control (2) so that the spindle (5) returns to the initial position, without this occurrence affecting the fall of the product (4) into the discharge area.

[0038] The essential nature of this invention is not altered by variations in materials, form, size and arrangement of the component elements, described in a non-restrictive manner, being sufficient for an expert to proceed to the reproduction thereof.

Claims

1. - Anti-blocking mechanism of vending machines with cashbox of among those which comprise a revolving drum (1) for collection of the product (4) **characterized by** the presence of a spindle (5) housed in a drilled hole (1.2) perpendicular to the axle of the drum (1) and guided by an interior profile (6.1) of a fixed piece (6) located externally to the drum (1), so that when the initial turn of the control (2) of the cashbox (3) is carried out at high speed, the spindle (5) comes up against an essentially vertical segment (6.1.2) of the interior profile (6.1) of the fixed piece (6), preventing the drum (1) from trapping the product (4) when it has not yet fully entered through an opening (1.1) of said drum (1), so that next, ceasing to apply pressure on the control (2) of the cashbox (3), the spindle (5) ceases to abut upon the essentially vertical segment (6.1.2) of the interior profile (6.1) at the same time as the product (4) finishes entering fully into the drum (1).
2. - Anti-blocking mechanism of vending machines with cashbox according to claim 1 **characterized in that** the spindle (5) in its initial position stands vertically supported on a lower segment (6.1.1) of the interior profile (6.1) of the fixed piece (6).
3. - Anti-blocking mechanism of vending machines with

cashbox according to claim 2 **characterized in that** starting from the initial position, on rotating the control (2) essentially through 180°, the spindle (5) rotates and later returns by gravity to its initial position, in which instant the opening (1.1) of the drum (1) is in its upper part. 5

4. - Anti-blocking mechanism of vending machines with cashbox according to claim 1 **characterized in that** the fixed piece (6) is fixed to the casing (7) of the machine wherein the drum (1) is also housed. 10

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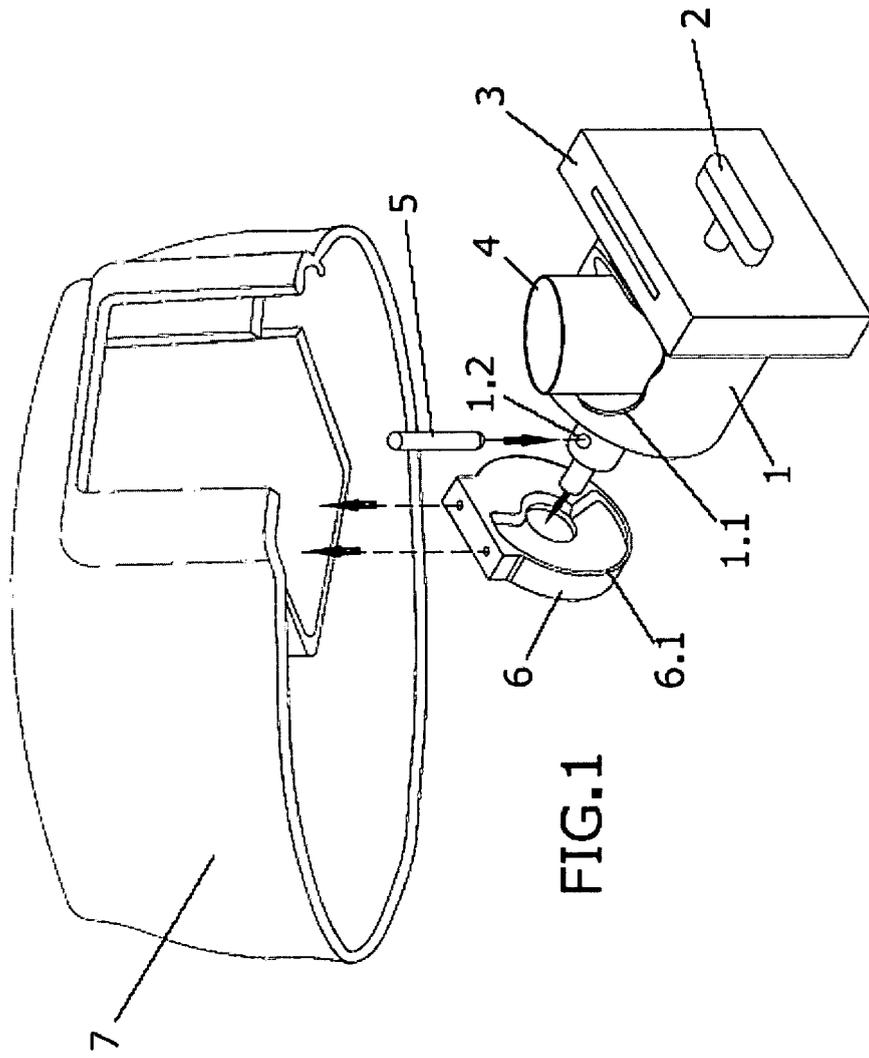
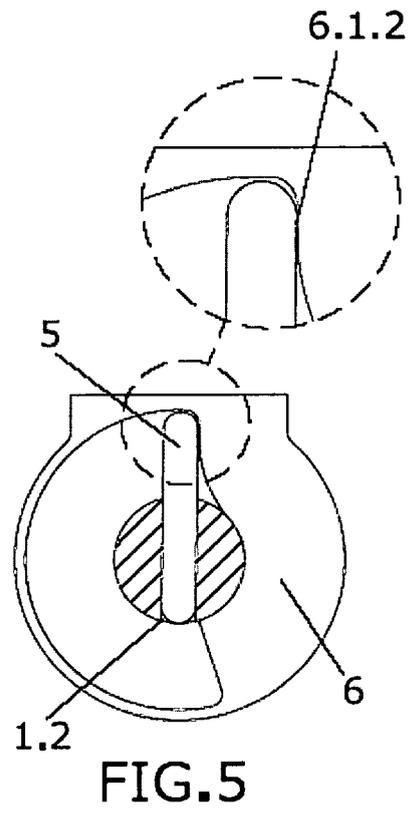
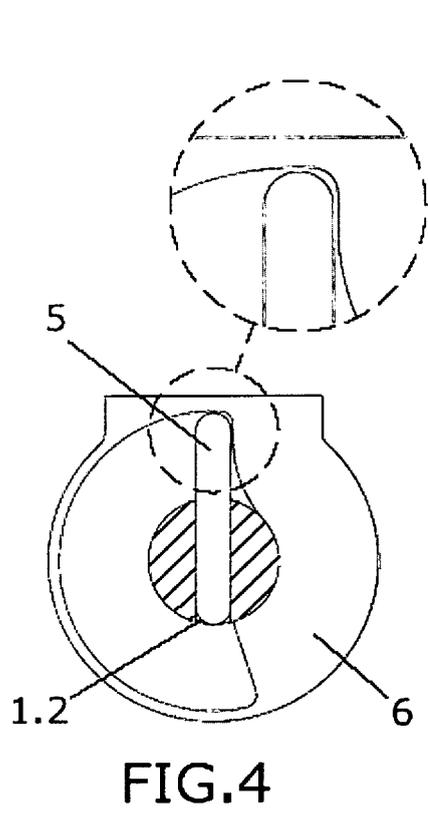
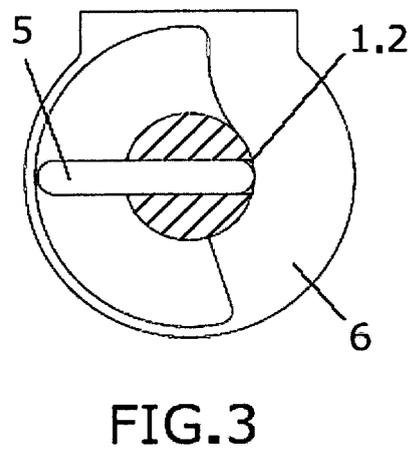
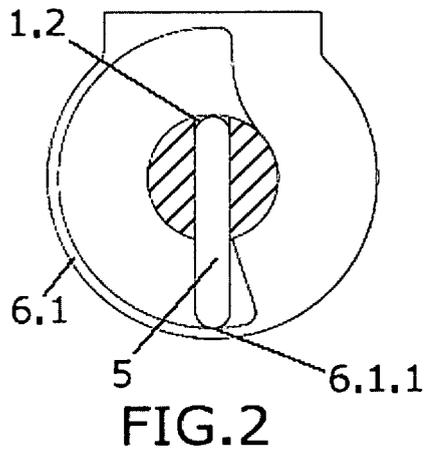


FIG.1





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/178790 A1 (ISHIDA SHOICHI) 18 August 2005 (2005-08-18) * paragraph [0013] - paragraph [0016] * * paragraph [0047] - paragraph [0054]; figures 1,7-9 *	1-4	INV. G07F11/24
D,A	----- ES 2 116 942 A1 (LAIV, S.L) 16 July 1998 (1998-07-16) * column 1, line 28 - column 2, line 13; figures 3-6 *	1	
A	----- US 4 429 806 A (SCHWARZLI ET AL) 7 February 1984 (1984-02-07) * column 1, line 32 - column 2, line 2; figures 3-7 *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			G07F B65G
Place of search		Date of completion of the search	Examiner
The Hague		4 May 2006	Reino, B
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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EPO FORM 1503 03.82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 38 1007

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04-05-2006

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- PT 101787 [0005]
- ES 2116942 [0006]