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**COIN REFUNDER FOR PAYING MECHANISMS**

The present invention refers to a coin refunder  
10 for paying mechanisms, installed in machines or apparatus  
activated by means of coins, such as vending machines,  
games machines, etc.

Throughout the present Specification, under the  
15 name of "coins" must be understood to mean coins both of  
legal tender and tokens chips.

Coin refunders for the purpose indicated  
comprise a container chamber or deposit for coins  
20 equipped with a coin extractor mechanism and a counting  
system for the supplied coins.

Refunding machines are known in which said  
mechanism is constituted based on an ascending chain, the  
25 links of which are configured for dragging each one,  
and supplying a coin coming from the container chamber.  
Also known, are refunders which include disks with  
through holes, which operate in the manner of tube  
payers. One and all of the refunders are excessively  
30 voluminous, due to which, their installation presents  
problems of space.

The oldest and most traditional refunders, use,  
as the coin extractor mechanism, a rotary disk which  
35 constitutes the bottom of a side of the chamber of

container deposit for the coins, the disk of which is provided on its internal surface with circumferential distributing pivots in concentric position with the disk. The pivots constitute the elements which are in charge of dragging the coins towards the out-put mouth, during the rotation of the disk. This mechanism presents jamming problems and is in addition not very multi-coin, that is to say, that it can admit a very limited variety of coins of different sizes. Instead of pivots, the rotary disk can be provided with recesses or formations which are capable of acting as bearing for the dragging of the coins.

The object of the invention is to solve the indicated problems, by means of a refunder which includes a coin extractor mechanism with relatively reduced volume, which admits a wide variety of coins of different sizes and that does not present jamming problems.

The refunder of the invention is of the traditional type, that is to say, it is comprised of a chamber or deposit with a zone including a rotary disk equipped with dragging means for the coins and is characterized in that said dragging means are constituted by retractile blades, preferably radial, which project through the internal surface of the disk in contact with the coins to be dragged, and are displaceable between an extracted position, in which they partially project from the surface of the disk and are capable of dragging the coins, and a retracted position, in which they do not project as regards the surface of the disk. The blades are elastically impulsed towards the extracted position and are displaceable towards the retracted position when they reach the arm which intercepts the circular path of the disk or the adjacent areas of said arms.



The blades can be impulsed towards the retracted position by means of different systems, for example, by the actual arm which intercepts the circular path of the coins or by means of an activation device which acts  
5 on the blades when it reaches the adjacent areas of the arm which intercepts the circular path of the coins.

Essentially, the invention is based on the existence of retractile blades, which in their extracted  
10 position drag the coins towards the arm which intercepts the circular path of the same, at which moment they occupy the retracted position in order to be displaced under said arm, thus not constituting any obstacle for the continuation of the rotation of the disk.

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The blades are circumferentially separated from each other by a slightly larger magnitude than the diameter of the maximum sized coin. With this constitution, the blades can drag any size of coin without  
20 producing additional jamming of coins, since each blade can act only on the edge of a coin, abutting against the surface of the disk.

The characteristics and advantages of the  
25 refunder of the invention can be better understood with the following description, made with reference to the enclosed drawings, in which a non limitative, exemplary embodiment is represented.

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In the drawings:

Figure 1 is a top plan view of the rotary disk which defines a zone of the chamber or receiver deposit for the coins, including the dragging means of the coins  
35 of the invention.

Figure 2 is a cross section of the disk, taken on line II-II of figure 1, at larger scale.

Figure 3 is a bottom view of one of the blades  
5 of figure 1, taken according to direction A of figure 2.

Figure 4 is a side view of the same blade, according to direction B of figure 3.

10 Figure 5 is a similar view to figure 1, showing a variant in the performance of the mechanism for the retraction of the blades.

Figure 6 is a cross section of the disk  
15 according to line VI-VI of figure 5, at larger scale.

Figure 7 is a partial perspective view of the disk of figure 5.

20 Figures 1 through 4 represent a rotary disk 1 which defines a zone of the surface of a receiver chamber or deposit for coins, of constitution known per se. In the example represented in the drawings, disk 1 is toothed around its periphery 2 in order to mesh with an  
25 activating pinion, though other systems or activating means could be used. On the internal surface of disk 1 coins 3 bear, housed in the receiver chamber or deposit. Disk 1 is mounted on a support 4 in which a flat arm or small blade 5 are attached, which bear on the internal  
30 surface of the disk. Also on support 4, a tilting lever 6 is mounted, the out-put mouth for the coins being defined between the same and the adjacent edge of the arm or small blade 5.

35 Disk 1 is provided with dragging means for the

coins 3 when it rotates in direction to arrow F. The arm or small blade 5 intercepts the circular path of the coins 3, displacing them towards the out-put mouth limited between said small blade and the tilting lever 6, which is pushed towards a retracted position by the actual coins, recovering its original position after the exit of said coin.

The refunder of the invention is characterized by the special constitution of the dragging means of the coins in disk 1.

According to the invention, these dragging means are constituted by retractile radial blades 7 which partially project through the surface in contact with the coins, and preferably run in radial direction, such as is shown in figure 2. The blades 7 are displaced between an extracted position, shown in figure 2 and 4, in which they partially project from the surface of disk 1 and a retracted position, in which they do not project as regards the internal surface of the disk. The blades are elastically impulsed towards the extracted position and are displaced towards the retracted position when they reach the arm or small blade 5 or the proximity of the same.

In the embodiment shown in figures 1 through 4, blades 7 form part of a plate 8 with elbowed profile which is provided on the section which runs below disk 1, of a transversal core 9 which is placed between parallel lugs 10 of an adjacent bridge 11 and attached to the rotary disk 1. Core 9 articulates between lugs 10 by means of shaft 12. As from the articulation zone, the plate 8 and the bridge 11 extend in portions 13 and 14 between which a helical spring 15 is mounted, which

impulses the blades 7 towards the extracted position shown in figure 2 and 4.

Support 4 on which disk 1 is mounted forms, in the proximity of the arm or small blade 5, a ramp 16, figure 2 on which the prolongation 13 of plate 8 of the blades bear, when they reach said proximity of the small blade 5, causing the tilting of the plate 8 in the direction of arrow G of figure 2, producing the retraction of blade 7, thus preventing its impact with the edge of the arm or small blade 5, in such a manner, that it does not constitute an obstacle for the continuation of the rotation of disk 1. The ramp 16, which acts as a cam for the activation of blades 7, is placed in such a manner that the retraction or concealment of the blades 7 takes place once the coin 3, dragged by said blade, has caused the displacement of the tilting arm 6, figure 1, so as to conduct its exit in traditional manner.

With the constitution indicated, blades 7 shall drag coins 3 until they exit through the mouth limited between the small blade 5 and the arm 6, thus occupying the retraction position before reaching the edge of the small blade 5. Once they surpass the arm or the small blade 5, blades 7 are impulsed towards the extracted position by means of spring 15.

The retraction of blades 7 can be achieved by any other system or mechanism. For example, the blades 7 could be articulated under disk 1 according to a perpendicular shaft to said blade, being impulsed towards the outside by means of a spring and hence occupying the retracted position when bearing on a profile or cam similar to the one referenced with number 16 in figure 2.

Figures 5 through 7 show another possible manner of actuation on the blades 7 in order to cause its retraction. As can be observed from figure 6, blades 7 also form part of a right angled elbowed plate and are  
5 impulsed towards the extracted position by means of a spring 15a which is mounted between the section of the blade which runs below the rotary disk 1 and a disk or locking plate 17, both attached by means of screws 18. The blades 7 extend as from their internal end into a  
10 section 7a which is adjacent to the central cone 18 of the refunder. Said section 7a is of decreasing height, until it reaches the surface of the rotary disk 1.

With this constitution, during the rotation of  
15 disk 1 in the direction of arrow F, when the prolongation 7a of each blade 7 meets the internal end of the arm or small blade 5, the ramp shape of this prolongation 7a progressively inserts under the small blade which causes the retraction of blade 7.

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The refunder of the invention is provided with counting means of the coins supplied or paid. Said means may consist of a detector mounted at the out-put mouth, limited between the small blade 5 and the tilting lever  
25 6, or constituted by the actual lever 6.

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### C L A I M S

1.- Coin refunder for paying mechanisms, which comprises a receiver chamber or deposit of coins, the bottom or part of its wall being constituted by a rotary disk (1) provided with dragging means (7) of the coins (3) according to a circular path which is intercepted by an arm or small blade (5) on which the edge of the coins (3) bear and which leads them towards an appreciably radial out-put mouth, in which means (6) are arranged for counting the coins supplied or paid, characterised in that the dragging means (7) of the coins (3) are constituted by retractile blades (7) which project though the surface of the disk (1) in contact with the coins (3), in preferably radial direction and are displaced between an extracted position, in which they partially project from said surface of the disk (1) and a retracted position, in which they do not project as regards said surface; the blades (7) being elastically impulsed towards the extracted position and being displaced towards the retracted position when said arm (5) or its proximity is reached by said blades (7).

2.- Refunder according to claim 1, characterised in that the blades (7) are impulsed towards the retracted position by means of arm (5) which intercepts the circular path of the coins (3).

3.- Refunder according to claim 1, characterised in that the blades (7) are impulsed towards the retracted position by means of an activating device which is placed behind the disk (1) and acts on the blades when they reach the proximity of arm (5) which intercepts the circular path of the coins (3).





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4.- Refunder according to claim 3, characterized in that the activating device of the blades (7) consists of a ramp or fixed cam (16) placed behind the rotary disk (1), in the proximity of arm (5) which  
5 intercepts the circular path of the coins (3), against which the blades (7) bear, being impulsed towards their retracted position.

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