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A coin dispensing apparatus

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## ABSTRACT

A coin dispensing apparatus, including a coin supply hopper (10) for storing a supply of coins C in bulk, and a coin feeding rotary disc means (16) supported within the coin supply hopper (10) at a lower extremity thereof. The disc means (16) includes a plurality of circumferentially spaced coin receiving through holes (18) extending through the peripheral portion of the coin feeding rotary disc (16). Adjustment means (31) are also provided on the underside of the disc means (16). The adjustment means (31) are provided for regulating the size of coins C which can pass through the coin receiving through holes (18).

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A COIN DISPENSING APPARATUS

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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

## A COIN DISPENSING APPARATUS

### Background of the Invention

The present invention relates to a coin dispensing apparatus of the type used in coin changers, game machines and the like for delivering coins or tokens from a coin supply hopper one at a time.

### Summary of the invention

The word "coin", as used within the description and claims of this specification, is understood to include coins, discs, medallions, tokens and other disc-like objects and the like. It is understood that this term is not limiting in terms of size, shape or material construction.

It would be desirable to provide a coin dispensing apparatus which can be relatively easily adapted for dispensing batches of coins of differing sizes.

It would also be desirable to provide an improved guide body for assisting in the guiding of coins from a coin supply hopper and through the dispensing apparatus, such that the apparatus is able to dispense coins at a constant rate, even when a high dispensing rate is required.

According to the present invention there is provided a coin dispensing apparatus, including:  
a coin supply hopper for storing a supply of coins in bulk;  
25 a coin feeding rotary disc means supported within the coin supply hopper at a lower extremity thereof;  
the disc means including a plurality of circumferentially spaced coin receiving through holes extending through the peripheral portion of the coin feeding rotary disc; and  
30 adjustment means provided on the underside of the disc means, the adjustment means provided for regulating the size of coins which can pass through the coin receiving through holes.

Preferably, the coin dispensing apparatus includes a coin guide means provided on the upper surface of the disc means, for guiding coins into the coin receiving through holes.

- 5 In one form, the coin guide means includes at least one coin guide surface, provided for contacting and guiding coins into the coin receiving through holes, wherein the at least one surface extends in a generally axial direction relative to the disc means.
- 10 Preferably, however, a plurality of coin guide surfaces are provided, the plurality of coin guide surfaces being configured into an at least approximately star-shaped arrangement.

Preferably, the coin guide surfaces are provided on separate coin guide arms.

**Brief Description of the Drawings**

In order to assist in arriving at an understanding of the present invention, a preferred embodiment is illustrated in the attached drawings. However, it should be understood that the following description is illustrative only and is not to be understood as restricting the generality of the invention as described above.

Figure 1 is a front view of one embodiment of the present invention.

- 25 Figure 2 is a cross-sectional side view of the embodiment of the present invention illustrated in Figure 1.
- 30 Figure 3 is an exploded perspective view of the embodiment of the present invention illustrated in Figures 1 and 2.

**Detailed Description of the Drawings**

Referring to the drawings illustrating an embodiment according to the present invention, a coin supply hopper 10 is mounted on a supporting base plate 11 supported at about 60 degrees to the horizontal by a supporting frame 12. The supporting frame 12 is mounted on a horizontal mounting plate 13. The

horizontal mounting plate 13 includes downwardly bent edges 13a, upon which the horizontal mounting plate 13 is supported.

A coin feeding rotary disc 14 is rotatably supported on the inclined base plate 11 at one side within the coin supply hopper 10 (shown in phantom lines) and connected to central rotary shaft 15.

The coin feeding rotary disc 14 has a disc body 16 and a circumferential wall 17 which is integrally formed with the disc body 16 in the form of a pan. The disc body 16 is provided with a plurality of, for example, seven circumferentially spaced coin receiving through holes 18. In operation, the disc 14 is rotated in the clockwise direction by a central rotary shaft 15. The central rotary shaft 15 is rotated by an electric motor 19 via gearbox 20. (See Figure 2).

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The coin supply hopper 10 has an upper portion 21 and a cylindrical lower portion 22, which is fixed to the inclined base plate 11 around the coin feeding rotary disc 14 having the circumferential wall 17. The upper portion 21 of the coin supply hopper 10 is pot-shaped, and is large enough to retain the desired volume of coins. The lower portion 22 of the coin supply hopper 10 is installed onto and fixed to the supporting base plate 11. The coin supply hopper 10 is constructed from molded resin.

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The apparatus is provided with a coin outlet 23.

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A handle 24 is attached to the supporting frame 12.

At suitable locations on and towards the lower end of the supporting base plate 11, a plurality of elongate openings 25 are provided. The openings 25 allow for dust and the like to fall through the openings 25 and thereby be removed from the surface of the base plate 11.

A slender stationary support plate 26 is provided on the lower edge of the supporting base plate 11. The support plate 26 is provided for attaching and

supporting the coin supply hopper 10. A second support plate 27 is attached to the upper edge of the supporting base plate 11. The second support plate 27 is provided for, likewise, attaching and supporting the coin supply hopper 10. The second support plate 27 is vertically slideable relative  
5 to the supporting base plate 11. The second support plate 27 can be secured at a desired height to the supporting base plate 11, by the use of suitable fasteners (not illustrated).

Referring especially to Figure 3, a coin guide 28 is provided on the upper  
10 surface of the disc 14. In the embodiment illustrated the coin guide 28 is generally star-shaped. However, it is to be appreciated that other shapes are envisaged for the coin guide 28. The coin guide 28 is affixed to the disc body 16 of disc 14 via fasteners in the form of screws 29b, which secure the coin guide 28 to the disc body 16 via securing apertures 29 and 29a. The coin  
15 guide 28, therefore, rotates with the disc body 16. The coin guide 28 includes coin guide surfaces 30 which, in light of the clockwise direction of rotation of the coin guide 28, assist in guiding and encouraging coins within the coin supply hopper 10 to enter the holes 18 in the disc body 16. It is to be appreciated that the number of coin guide surfaces 30 should correspond  
20 to the number of holes 18 in the disc body 16, such that one coin guide surface 30 is associated with one disc hole 18. In the embodiment illustrated, seven holes 18 are provided in the disc body 16, and so seven coin guide surfaces 30 are provided on the coin guide 28. However, if, for example, the number of holes in the disc body 16 was three then the required  
25 number of coin guide surfaces 30 on the coin guide 28 should be three.

An adjustment plate 31 is provided. The adjustment plate 31 includes a plurality of slender, curved teeth 32, with each of the teeth 32 including a tip 33. It is to be appreciated that the illustrated adjustment plate 31 should  
30 include seven teeth 32, rather than eight teeth; so that the number of teeth 32 coincides with the number of holes 18 in disc 16. The adjustment plate 31 is freely rotatable about the seat 34 of the shaft 15, and is located on the underside of the rotary disc 14. Indeed, the adjustment plate 31 is secured to the underside of the rotary disc 14 via fasteners in the form of screws 29b to

securing apertures 35 provided in the adjustment plate 31. The tips 33 of the teeth 32 are each bent slightly downwards, assisting in the removal of coins from beneath the disc 14. Preferably, the number of teeth 32 provided on the adjustment plate 31 corresponds to the number of through holes 18 5 provided in disc 14, with each of the teeth 32 associated with a respective through hole 18. It is to be appreciated that the adjustment plate 31 can be shaped differently to the embodiment illustrated, if desired.

It is to be appreciated that the same set of fasteners 29b are used to attach 10 both the coin guide 28 and the adjustment plate 31 to the disc 14. In other words, each of the fasteners extends through the coin guide 28, the disc 14 and the adjustment plate 31, such that the coin guide 28, the disc 14 and the adjustment plate 31 are securely connected.

15 It is possible to alter the set-up of the apparatus such that it can be used with coins of a different size. This is done by altering the effective hole size 36 (see Figure 1) of the holes 18 in the disc 14, by rotating the adjustment plate 31 relative to the disc 14, such that each of the teeth 32 of the adjustment plate 31 partially obscures a respective hole 18 of the disc 14. This reduces 20 the size of the coins C which are able to pass through the holes 18. It is possible to rotate the adjustment plate 31 relative to the disc 14, because the fasteners 29b provided for attaching the adjustment plate 31 to the disc 14 extend through the apertures 29 in disc 14, which are arcuately elongated on the surface of the disc 14. This allows for the adjustment of the 25 adjustment plate 31 relative to the disc 14, as desired.

Referring to Figure 3, a small disc-like spacer 37 is provided. The thickness of the spacer 37 is chosen according to the thickness of the coin to be dispensed by the apparatus. Alternatively, a plurality of concentric spacers 30 can be used to replace the illustrated single spacer 37, if desired. The spacer 37 is freely rotatable about the seat 34 of the rotary shaft 15.

A small plate 38 is provided between the spacer 37 and the base plate 11. The plate 38 is provided to assist in the smooth rotation of the disc 14. While

only one plate 38 is illustrated, it is to be appreciated that a plurality of thin concentric plates could instead be used, if desired. The plate 22 is freely rotatable about the seat 34 of the rotary shaft 15.

5 The disc 14 is mounted, via a central mounting aperture 39, to the rotary drive shaft 15. The disc 14 is caused to rotate with the shaft 15 via the aperture 39 having a straight edge. This straight edge mates with a straight edge provided along the shaft 15, thereby causing the disc 14 to rotate with the shaft 15 when the shaft 15 rotates.

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As previously stated, the coin guide 28 is fitted to the upper surface of the disc 14; while the adjustment plate 31 is fitted to the lower surface of the disc 14. The coin guide 28 and the adjustment plate 31 are securely attached to the disc 14 by fasteners 29b. Accordingly, the rotary drive shaft 15 extends 15 through the centres of each of the coin guide 28, the disc 14 and the adjustment plate 31.

20 A cap 40 is placed over the end of the rotary shaft 15. The cap 40 is affixed to the end of the rotary shaft 15 by a fastener in the form of a bolt 41. The bolt 41 extends through a central aperture in the end of the cap 40 to threadably attach to the end of the rotary shaft 15, to thereby press and affix the cap 40 onto the end of the shaft 15.

25 The lower portion 22 of the coin supply hopper 10 has a portion of its sidewall removed (not illustrated) so as to provide an exit for the coins being emitted from the apparatus. A coin discharge path (not illustrated) is provided on the surface of the base plate 11. The coin discharge path leads to the coin exit 23.

30 A pivoting coin guide member 42 is placed on the base plate 11 proximate the coin exit 23. The pivoting coin guide means 42 is constructed from a rectangular steel plate, which is bent into an approximate L-shape, thereby providing two approximately right-angled portions. A first portion 43 (as illustrated in Figures 1 and 3) of the pivoting coin guide means 42 lies

approximately in the plane of the upper surface of the base plate 11. The second portion (not illustrated), which is integral with and extends from one end of the first portion 43 at right angles thereto, extends downwardly through an aperture (not illustrated) in the base plate 11. The second portion

5 is freely rotatably mounted to the underside of the base plate 11 by a hinge or similar (not illustrated). Thus, both the first portion 43 and the second portion are rotatable about an axis running approximately parallel to the edges 44 and 45 of guide means 42. A resilient means in the form of a spring (not illustrated) is connected between the second portion and the

10 underside of the base plate 11. The spring biases the pivoting guide means 42 about the hinge such that, at rest, the edge 44 of the first portion lies above the upper surface of the base plate 11; while the edge 45 lies below the surface of the base plate 11.

15 In operation, when the disc 14 rotates in the normal clockwise direction, the coins C in contact with the upper surface of the base plate 11 come into contact with the teeth 32 of the adjustment plate 31 which, along with the protruding edge 44 of the pivoting guide means 42, direct the coins C towards the coin exit 23.

20 Should the need arise to operate the disc 14 in the anti-clockwise direction, then coins C are able to travel over the surface of the base plate 11 and pass over the pivoting guide means 42, due to the combined effect of the edge 45 lying below the surface of the base plate 11 and guide means 42 being pivotally spring biased.

25 To ensure that the pivoting coin guide member 42 does not interfere with the rotation of the various elements which rotate around the shaft 15, the upper surface of the spacer 37 is in a higher parallel plane relative to the base plate

30 11 than is edge 44 of the first portion 43 of the coin guide member 42.

In operation, identical coins C are stored in bulk in coin supply hopper 10. The electric motor 19 is operated, causing the disc 14 to rotate in the clockwise direction, as illustrated in Figure 1.

When the disc 14 is rotated, a plurality of coins are encouraged into positions proximate to the position of the disc through holes 18, due to the presence of the coin guide means 28. The present apparatus is capable of dispensing a

5 constant supply of coins C even when the disc 14 rotates at a relatively high speed, so long as an adequate supply of coins is provided in the coin supply hopper 10. Therefore, it is desirable to maintain an adequate supply of coins C in the coin supply hopper 10.

10 The apparatus can be adjusted to accommodate different sized coins C. This is possible by rotatably adjusting the adjustment plate 31 relative to the disc 14. When it is desired for the apparatus to dispense smaller coins, then the adjustment plate 31 is rotated slightly in the counterclockwise direction relative to the disc 14, thereby causing the teeth 32 of the adjustment plate

15 31 to encroach upon the through holes 18, thus creating a smaller aperture 36 (see Figure 1) through which coins are able to pass. Once adjusted, the adjustment plate can be secured in the desired orientation to the disc 14 by the fasteners 29b.

20 Referring to Figure 1, coins (not illustrated in this drawing) pass through the apertures 36 created by the disc through holes 18 and the teeth 32 of the adjustment plate 31. Upon passing through the disc through holes 18, the coins contact the upper surface of the base plate 11, at which point they are then contacted and moved in a sliding motion across the upper surface of the

25 base plate 11 and towards the coin outlet 23 by the teeth 32, which rotate in a clockwise direction about rotary shaft 15.

It is to be appreciated that apertures 36 prevent any coins of a larger diameter than desired (which, for example, were accidentally included in a

30 supply of coins added to the coin supply hopper 10) from being dispensed from the apparatus. This feature is provided by virtue of the fact that the size of the apertures 36 created by the holes 18 and teeth 32 is selected to accommodate coins of a specific diameter. Therefore, coins of a larger diameter will not be accepted.

The size of the holes 18 are initially chosen by considering the largest diameter of coins that are likely to require dispensing from the apparatus.

5 The coins C, when moved along their path of travel towards the coin outlet 23, actuate a roller 46. The roller 46 is connected to a sensor (not illustrated), which is provided to count the number of coins that are dispensed by the apparatus. The roller 46 is resiliently movable via a resilient means in the form of a spring (not illustrated).

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The coin feeding rotary disc 14 has been illustrated as lying on an inclined base plate 11. It is to be appreciated, however, that the rotary disc 14 could instead be oriented at a different angle to the horizontal, if desired. Indeed, the rotary disc 14 could lie in a horizontal plane if desired.

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The rotary disc 14 in the illustrated embodiment includes a circumferential wall 17. However, the circumferential wall 17 could be removed if desired. Also, the disc 14 could be thicker than the embodiment illustrated in the drawings. The disc could also be integral with the coin guide 28, if desired.

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One advantage of the present invention is that the apparatus can be relatively easily adapted for dispensing batches of coins of differing sizes. A further advantage of the present invention is that it includes an effective guide body for assisting in the guiding of coins into the through holes 18 in the disc 14 for dispensing from the apparatus, such that the apparatus is able to dispense coins at a constant rate, even when a relatively high dispensing rate is required.

## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A coin dispensing apparatus, including:
  - a coin supply hopper for storing a supply of coins in bulk;
  - a coin feeding rotary disc means supported within the coin supply hopper at a lower extremity thereof;
  - the disc means including a plurality of circumferentially spaced coin receiving through holes extending through the peripheral portion of the coin feeding rotary disc; and
  - adjustment means provided on the underside of the disc means, the adjustment means provided for regulating the size of coins which can pass through the coin receiving through holes.
2. A coin dispensing apparatus according to claim 1, including a coin guide means provided on the upper surface of the disc means, for guiding coins into the coin receiving through holes.
3. A coin dispensing apparatus according to claim 2, wherein the coin guide means includes at least one coin guide surface, provided for contacting and guiding coins into the coin receiving through holes, wherein the at least one surface extends in a generally radial direction relative to the disc means.
4. A coin dispensing apparatus according to claim 3, wherein a plurality of coin guide surfaces are provided, the plurality of coin guide surfaces being configured into an at least approximately star-shaped arrangement.
5. A coin dispensing apparatus according to claim 3 or claim 4, wherein the coin guide surfaces are provided on separate coin guide arms.
6. A coin dispensing apparatus substantially as herein described and illustrated with reference to the accompanying drawings.

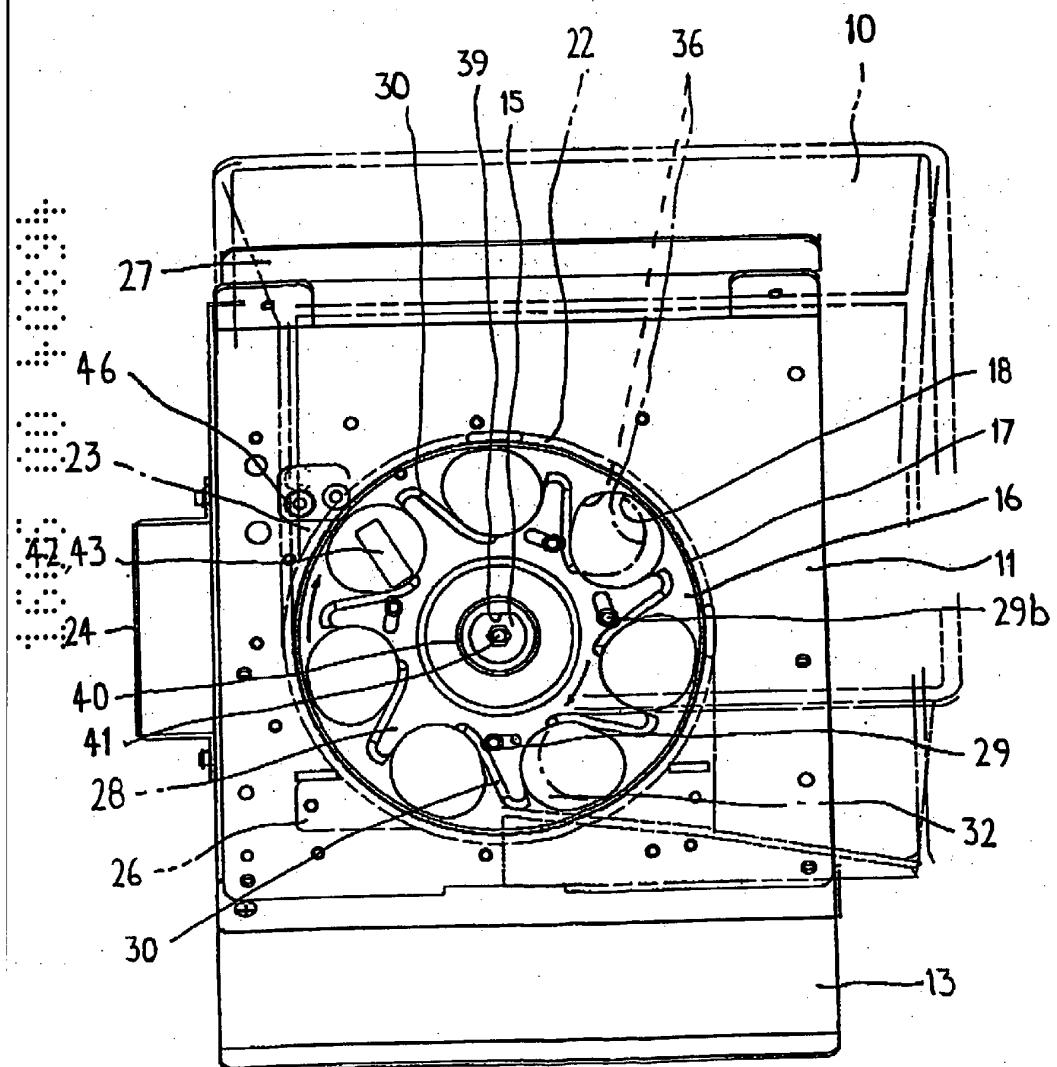
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## FIGURE 1



**FIGURE 2**