

SPECIFICATION

Coin storage device

5 The present invention is concerned with coin and token dispensing apparatus suitable for incorporation in coin operated vending machines and other automatic machines which dispense coins or tokens. For example, such vending machines
10 conventionally incorporate a coin apparatus which receives coins of various denominations, determines the denomination and authenticity of the coins, rejects slugs and coins of unacceptable denominations, determines and sums the values of
15 acceptable coins, produces a vend signal when acceptable coins equalling or exceeding in value the price of the item to be vended have been inserted, and dispenses change in an amount equal to the excess of the value of the inserted coinage over the
20 price of the item selected. The coin selector apparatus is usually housed within a case whose external dimensions and coin box passages for input, rejection and change-giving conform to standards which have evolved in the vending
25 machine industry.

In a coin dispenser for such a vending machine coin apparatus, coin tubes store supplies of coins segregated by denomination for change-giving purposes. The coin tubes are dimensioned to hold
30 sufficient coins for anticipated change-giving purposes, and may be arranged to be replenished by coins of the appropriate denomination from coin sorter apparatus. When coins having a value exceeding the price of the desired item are inserted,
35 the difference from the price is determined and change dispenser mechanisms at the foot of the coin tubes are actuated to dispense the proper change. Apparatus in which the coin tube device of the present invention can be employed is shown, for
40 example, in U.S. Patents 3844115 and 3906965.

The present invention is principally concerned with the structure of the coin tubes which retain stacks of coins sorted according to denomination for automatic coin dispensing for change-making and
45 the like.

According to the present invention there is provided a coin storage device in or for use in apparatus for sorting, storing and dispensing coins, having two or more generally vertical coin tubes, the
50 coin tubes being formed by a front longitudinal segment and a rear longitudinal segment which are separable in the region of the longitudinal axes of the tubes, and fastener means for releasably securing the two segments together, the fastener
55 means extending forwardly so as to be manually operable from the front whether in its released or fastening condition.

This arrangement permits a machine serviceman to separate the coin tube halves to remove coins, to
60 free coin jams, and to clear the coin tubes of dirt and debris.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings, of which:-

65 *Figure 1* is an exploded perspective view of one

form of coin tube device in accordance with the present invention;

Figure 2 is an elevational view of the coin tube device of *Figure 1*; and

70 *Figure 3* is an enlarged, partial view in cross-section taken along line III-III of *Figure 2*.

Referring now to the drawings, a preferred embodiment of the coin tube device is moulded of suitable plastics materials as two major pieces, a
75 rear longitudinal segment 100, and a removable front longitudinal segment 200. The rear segment 100 is fastened within the vending machine and the front segment 200 is detachably secured to the rear segment by cam lock latch fasteners 301, 302 to form
80 an assembled device.

The rear segment 100 is moulded in one piece of durable plastic such as a polyphenyl oxide resin. The upper portion of the rear segment includes an inclined coin track 120 which receives acceptable
85 coins from a coin tester above (not shown). The coins roll along coin track 120 until they reach the apertures 110, 105, 125, each of which is sized for the particular coin. When the coin reaches the aperture for that denomination the coin falls through the
90 aperture and into a coin tube 10, 5, 25 for the denomination of the coin, for example, the ten-cent, five-cent and twenty-five-cent coins of U.S. coinage respectively. The lower portion of the rear segment comprises coin tube halves 10a, 5a, 25a sized to
95 accommodate coins of different denominations.

The front segment 200 is moulded in one piece from a durable, preferably transparent, plastics material such as a polycarbonate resin. The front segment 200 includes the other halves 10b, 5b, 25b
100 of the coin tubes and is configured to mate with the rear segment 100 to form complete coin tubes. A hopper structure 210 permits a machine serviceman to load the coin tubes 5, 10 with coins. The lower ends of the coin tubes attach to a coin dispenser
105 mechanism 400 for dispensing coins to the customer. The surface portion 220, 222 of the outer face of front segment 200 forms a portion of a coin passageway for rejected coins. Coins which are not accepted by the vending machine are routed
110 through aperture 150 of the rear segment 100 from the coin tester above (not shown) and fall along surfaces 220, 222 of the front segment 200 to be returned to the customer.

The front and rear segments 100, 200 fit the coin dispenser mechanism 400 located at the foot of the coin tubes. The coin dispenser mechanism 400
115 includes horizontally movable slides 425, 405, 410 which have apertures sized to receive a single coin from the bottom of the coin tube stack.

120 Reciprocation of the movable slides causes a single coin to be delivered from the coin tube associated with the reciprocated slide in the usual fashion. A more detailed description of a suitable coin dispenser mechanism is found in U.S. 3,814,115.

125 The front and rear segments 100, 200 are detachably assembled together by cam lock fasteners 301, 302, so as in this constructional example to mate in a plane generally parallel to the longitudinal axes of the tubes. The fasteners are in
130 form of a shaft 304 surmounted by a wing tab

portion 308. The tab portion 308 freely passes through a slot 233, 235 formed between coin tube halves 5b and 10b of the front segment 200. Shaft 304 includes an integral collar 305 and circular clip-receiving groove 306. The collar and clip serve to retain the cam lock fasteners in the rear segment 100 while allowing them to rotate freely.

Turning the cam lock fasteners 301, 302 through 90° locks the front and rear segments together. Since coin tube halves 10b and 5b are sized for coins of different denominations, they differ in diameter. The exterior radius of coin tube half 10b is designated R2 in Figure 3. In order that the configuration of the tab portion 308 of the cam lock fastener be symmetrical, portions 232, 234 of the exterior of larger coin tube half 5b are excavated to a radius R1 equal to radius R2. Thus, the surfaces of both coin tube halves 10b and 5b, which surfaces are engaged by the tab portion 308, are symmetrical to allow the cam lock fasteners to be turned in either direction to lock. The underside of the tab portion 308 has two concave recesses with a curvature that conforms to the curvature R1 and R2 of the exterior surfaces of the coin tubes 10 and 5. Rotation of the tab portions 308 to a position transverse to the slots 233 and 235 causes the concave recesses of the undersides of the tab portions to cam against the exterior of the adjacent coin tubes, pulling the two segments 100 and 200 firmly together. Proper alignment of the two segments 100 and 200 is assured by a protuberant tongue 140 located between coin tube halves 25a and 5a of the rear segment 100. A conforming groove (not shown) is located between coin tube halves 25b and 5b of the segment 200. The tongue and cam lock fasteners 301, 302 together provide three alignment points.

CLAIMS

1. A coin storage device in or for use in apparatus for sorting, storing and dispensing coins, having two or more generally vertical coin tubes, the coin tubes being formed by a front longitudinal segment and a rear longitudinal segment which are separable in the region of the longitudinal axes of the tubes, and fastener means for releasably securing the two segments together, the fastener means extending forwardly so as to be manually operable from the front whether in its released or fastening condition.

2. A coin storage device according to claim 1 wherein the front and rear segments are separable in a plane generally parallel to the longitudinal axes of the tubes.

3. A coin storage device according to claim 1 or claim 2, wherein the fastener means remains attached to one of the segments when they are released from one another.

4. A coin storage device according to claim 3, wherein the fastener means extend through one or more apertures in the other segment to terminate in each case between two adjacent coin tubes.

5. A coin storage device according to any preceding claim, wherein the fastener means is operable to apply a camming action for clamping the

front and rear segments together.

6. A coin storage device according to claim 5 as appended to claim 3 or 4 wherein the fastening means includes a tab which is movable so as to exert a camming action on a part of the other segment to press the two segments tightly together.

7. A coin storage device according to claim 6, wherein the fastener means comprises a cam lock having a shaft and said movable tab thereon which both remain attached to the rear segment when the front segment is released.

8. A coin storage device according to claim 7, wherein the fastener means comprises a plurality of cam locks.

9. A coin storage device according to any preceding claim wherein the fastener means comprises a cam lock carried by the rear segment, the cam lock having a shaft surmounted by a rotatable tab portion passed through a slot formed in the front segment and located between adjacent coin tubes, the tab portion exerting a camming action against the exterior or the adjacent coin tubes when the tab portion is rotated to a position transverse to the slot.

10. A coin storage device according to claim 9, wherein the exterior surfaces of the coin tubes in the region immediately adjacent the slot in the front segment are in the form of cylinders of equal radii and the tab portion of the cam lock is configured to engage the cylindrical surfaces.

11. A coin storage device according to any of claims 1 to 10, further comprising means to align the front and rear segments when assembled.

12. A coin storage device according to any preceding claim, further comprising a coin track, along which coins can roll, attached to one of the front and rear segments, and coin sorting apertures alongside the track, each of the apertures being sized to pass a particular denomination coin to allow that coin to enter an appropriate coin tube.

13. A coin storage device substantially as hereinbefore described with reference to the accompanying drawings.



portion 308. The tab portion 308 freely passes through a slot 233, 235 formed between coin tube halves 5b and 10b of the front segment 200. Shaft 304 includes an integral collar 305 and circular clip-receiving groove 306. The collar and clip serve to retain the cam lock fasteners in the rear segment 100 while allowing them to rotate freely.

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5. A coin storage device according to any preceding claim, wherein the fastener means is operable to apply a camming action for clamping the

front and rear segments together.

6. A coin storage device according to claim 5 as appended to claim 3 or 4 wherein the fastening means includes a tab which is movable so as to exert a camming action on a part of the other segment to press the two segments tightly together.

7. A coin storage device according to claim 6, wherein the fastener means comprises a cam lock having a shaft and said movable tab thereon which both remain attached to the rear segment when the front segment is released.

8. A coin storage device according to claim 7, wherein the fastener means comprises a plurality of cam locks.

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