July 27, 1965 R. B. WHITE, JR 3,196,887

COIN SORTER

Original Filed March 9, 1959 2 Sheets-Sheet 1

FIG. 1

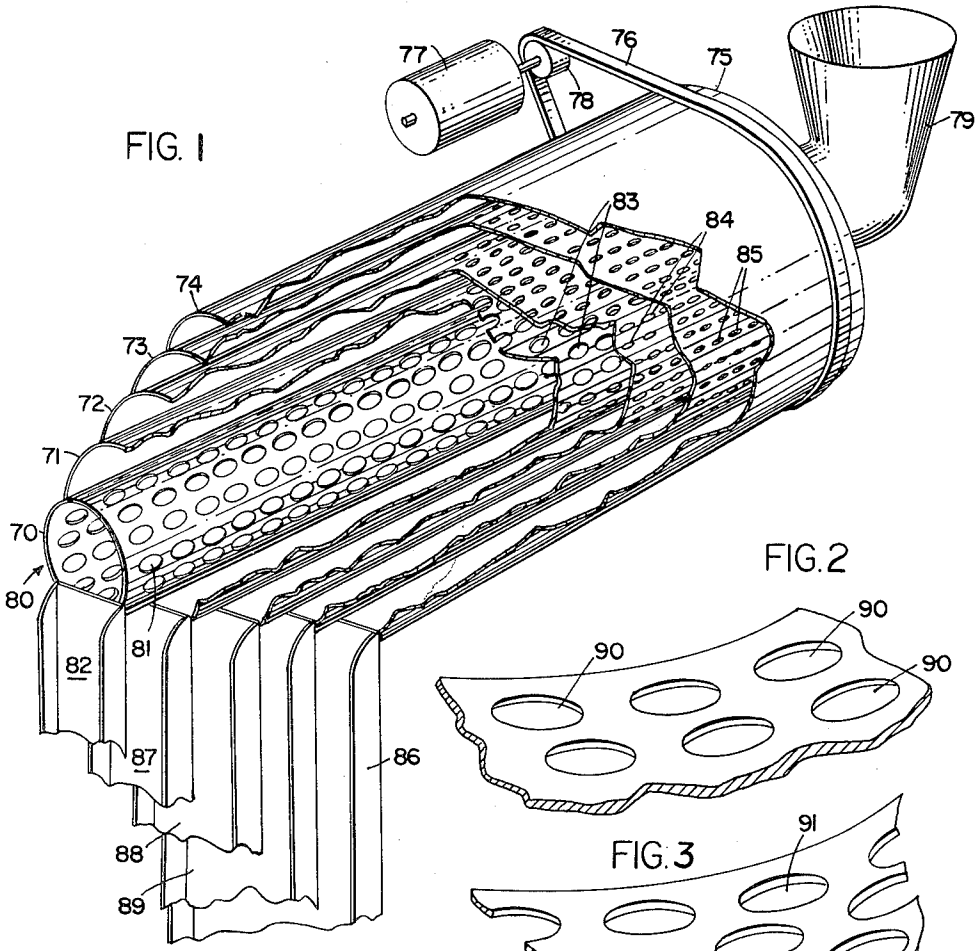


FIG. 2

FIG. 3

FIG. 5

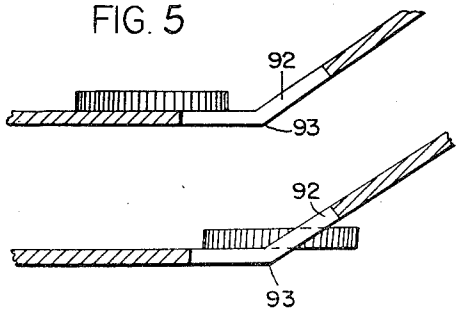
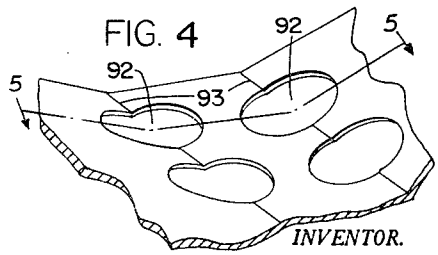


FIG. 6

FIG. 4



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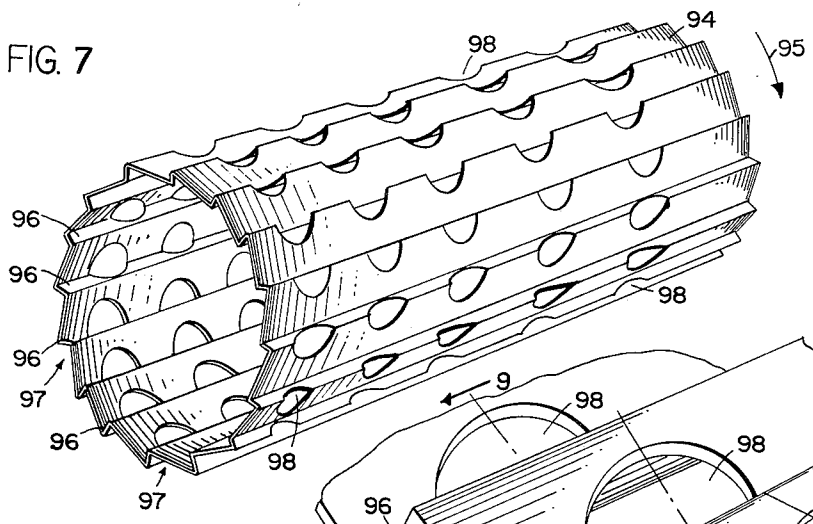
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COIN SORTER

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FIG. 7



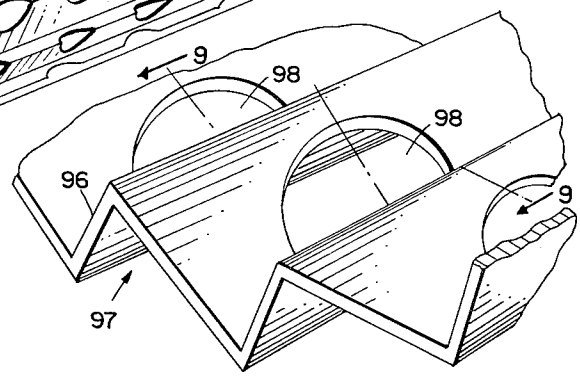


FIG. 8

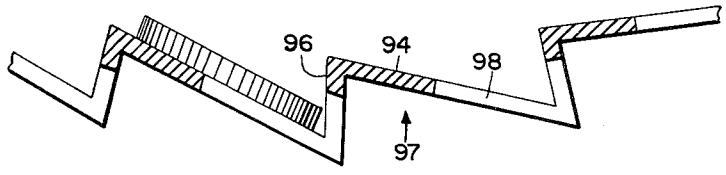


FIG. 9

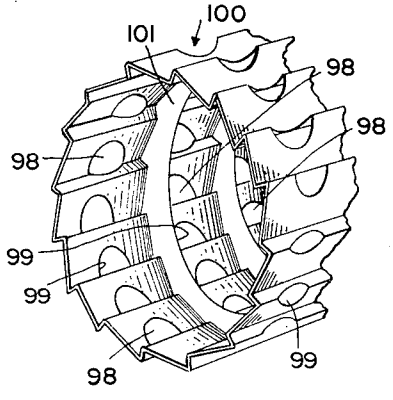


FIG. 10

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3,196,887

COIN SORTER

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Original application Mar. 9, 1959, Ser. No. 798,264, now Patent No. 3,147,839. Divided and this application June 10, 1964, Ser. No. 384,275

7 Claims. (Cl. 133—3)

This application is a division of application Serial No. 798,264, filed March 9, 1959, now Patent No. 3,147,839.

This application relates to coin processing devices. More particularly the invention disclosed herein comprises a new and improved coin sorting machine.

My invention is particularly suited for use by such organizations as telephone companies, transit authorities, vending machine operators, banks, parking meter operators, etc. which handle large quantities of coin. At the present time such organizations authenticate and count coins either manually or semi-automatically which are very slow and tedious processes. Typically, coins from telephone pay stations are processed by telephone companies in the following manner. The coins are removed from the telephones in individual boxes which are carried to a central accounting office. At these offices, the boxes are individually opened, and their contents spread out on small tables and inspected manually to separate the counterfeit from the authentic coins. Thereafter, the authentic coins are counted by machines provided for this purpose. Each telephone station must be credited with the dollar value of the authentic coins received by it so that the proprietor of the premises may receive his commission.

In the telephone system, my invention may be used in several ways. As a portable assembly, it may be taken to the site of each station and coins removed from the individual telephones may be proved and counted at or adjacent the premises. Alternatively, the assembly may be located at the central accounting office and receive the contents of the individual boxes as they are brought to the accounting office from the separate stations. By the use of my assembly, individual handling of the coins may be totally eliminated even to the extent of making the bookkeeping entries and drawing the lease or commission checks to the proprietors where the stations are located. This completely automatic handling is made possible because the machine may readily be connected to a conventional punch card process with no intermediate manual steps.

My portable assembly may also be used to collect coins from parking meters in a manner similar to that described above in connection with the removal of coins from individual telephone stations. For this purpose, a pick-up system is provided which is adapted to extract coins from parking meters and feed them automatically into the coin handling machine. This is carried out in a manner which is in effect pilfer proof.

My invention includes various subassemblies which may be arranged in various orders depending upon the particular application for the device. The subassemblies include a pick-up device for introducing coins to the assembly, a sorting mechanism for separating coins of various denominations according to size, a proving device for determining the authenticity of the coins of each denomination, a device for separating authentic but mutilated coins from those in good condition, and a counting mechanism for totaling the coins of each denomination and those rejected as mutilated, all shown in my patent

application Serial No. 798,264 filed March 9, 1959, now Patent No. 3,147,839 dated September 8, 1964.

Obviously, the various subassemblies may be used in different combinations. For example, the portable assembly used to collect coins from telephone stations and parking meters would include a pick-up device for introducing coins to the unit, a sorter for separating the coins of different denomination received by the meters or telephone stations, provers for testing the authenticity of the coins of each denomination received, and the counting mechanism for totaling the value of the coin received. Banks may have several assemblies each one consisting of a sorter, a single prover for the denomination of coin being handled, a mutilated coin rejector, and a counter.

My coin sorter will be better understood and appreciated from the following detailed description, read in connection with the accompanying drawing, in which:

FIGURE 1 is a fragmentary view partly in section of the coin sorting subassembly;

FIGURES 2–4 are fragmentary views in perspective illustrating different cylindrical forms which may be used in the sorter of FIGURE 1;

FIGURES 5 and 6 are cross sectional views taken along section line 5—5 of FIGURE 4 showing successive positions of a coin sorted by the cylinder;

FIGURE 7 is still another embodiment of cylinder which may be used in the sorter of FIGURE 1;

FIGURE 8 is an enlarged detailed view of the cylinder in FIGURE 7;

FIGURE 9 is a cross sectional view taken along the section line 9—9 in FIGURE 8; and

FIGURE 10 illustrates a modification of the cylinder or drum shown in FIGURE 7.

The sorter illustrated in FIGURE 1 is adapted to separate coins of all denomination. That is, pennies, nickels, dimes, quarters and half-dollars may be handled by it. In FIGURE 1, the mechanism includes five concentrically mounted drums **70**, **71**, **72**, **73** and **74** secured together at one end **75** by a web or similar means (not shown). The five concentrically mounted drums are rotated together about the common axis by a belt **76** which extends about the outer drum **74**. The belt **76** is in turn driven by a motor **77** and its pulley **78**. The relative diameters of the pulley **78** and the outer drum **74** provide the speed reduction necessary. Obviously, any other arrangement may be used to impart rotation to the drums.

The five concentrically arranged drums are specifically designed to separate the different denominations of coin, that is, pennies, nickels, dimes, quarters and half-dollars. All but the outer drum **74** are covered with a lattice of perforations and the perforations in each drum are sized to pass all but the largest size of coins fed to it.

Coins are introduced into the drum assembly through a hopper **79** which terminates at the inner drum **70** at the end **75**. The common axis of the drums is somewhat inclined, being lower at the end **80** and coins fed into the rotating drums will move by gravity from the hopper **79** toward the end **80**.

The perforations **81** formed in the drum **70** are large enough to pass pennies, nickels, dimes and quarters but are insufficient in size to allow half-dollars to pass through them. Thus, half dollars introduced into the drum **70** by the hopper will be carried by gravity to the end **80** of the assembly and slide down the chute **82**. Similarly, the drum **71** is covered with openings **83** which will not pass quarters but are large enough to pass pennies, nickels, and dimes. The holes **84** in drum **72** will not pass nickels, but will allow pennies and dimes to fall into the drum **73**. The holes **85** in drum **73** will retain pennies but will allow dimes to pass into the outer drum **74**. The drum **74** is imperforate, and, therefore, all coins which pass to it,

namely, dimes and small slugs will be discharged from it by the chute 86. It will be noted that drums 71–73 are also provided with discharge chutes 87, 88 and 89, respectively.

Although the outer drum 74 is illustrated and described as being imperforate, it should be understood that it also may be perforated to pass coins smaller than dimes to still another drum. In this manner, obviously small counterfeit coins may be separated from other coins which at least approximate the size of authentic coins.

The orientation of the perforations and the drums may take any of several forms. Various forms of each are suggested in FIGURES 2–10. In FIGURE 2, it will be noted that the holes 90 are aligned both longitudinally and circumferentially about the drum while in FIGURE 3, the holes 91 are arranged in staggered circumferential rows to increase their density. As between the embodiments of FIGURES 2 and 3, the latter is preferred, for obviously, a drum with such an arrangement will have a greater capacity.

In FIGURES 4–6, another embodiment of the drum is shown. In this embodiment, the drum is formed as a polygon rather than round in cross section and the openings or holes 92 lie on the corners 93 of the polygon. That is, the transverse diameters of the openings with respect to the axis of the drum are coincident with the joints or corners of adjacent surfaces. The advantage of such an arrangement is shown in FIGURES 5 and 6. While in the embodiments of FIGURES 2 and 3, a coin must drop through the openings 90 or 91, that is, its sides must in effect align themselves with the periphery of an opening. As the coin slides over the inner surface of the drum in the embodiment of FIGURES 4–6, a coin may slide out of the drum through the openings 92 without a change in its direction of motion relative to the drum. This action is suggested in FIGURES 5 and 6.

While each of the embodiments of FIGURES 2–4 are adequate to handle the sorting operation in most applications, it will be appreciated that difficulties may occur when a great volume of coins are to be sorted. When great numbers of coins are contained within a single drum, as the drum rotates, the coins pile up on one another at the lowermost part of the drum and only the coins which lie against the surface of the drum have an opportunity to pass through the openings to the next outer drum. To avoid this difficulty, a tumbling action may be introduced to distribute the coins more evenly about the inner surface of the drum and avoid particular coins from riding on the top of a pile throughout the sorting action. In the embodiment of FIGURES 7–10, this tumbling action is accomplished by providing the cross section of the drum 94 with a saw tooth configuration. Note that the arrow 95 in FIGURE 7 suggests the direction in which the drum turns. The leading side 96 of each tooth 97 serves as a support to carry the coins up the side of the drum. When the supporting surface 96 of the folds in the drum which define the saw tooth cross section become inclined in a downwardly direction, toward the center of the drum 94, the coins will fall or slide off these surfaces and the tumbling action results. Thus, coins are not allowed to build up on top of large coins or remain on the top of piles of coins but are continuously churned by the tumbling action.

It will be noted that the openings 98 formed in the drum are intersected by the bases of the leading sides 96 of the saw tooth sections and thus, the coins are allowed to slide out of the openings in the manner suggested in FIGURE 9. It will be appreciated that this action is substantially identical to that illustrated in FIGURES 5 and 6.

In FIGURE 10, an additional modification is suggested. Adjacent the low side 99 of each of the circumferential rows 100 of perforations 98, ribs 101 are formed which retard the longitudinal travel of the coins in the drum. These ribs which lie immediately adjacent the edges of the circumferential rows 100 of the holes align the coins with the perforations 98. As a result, those coins which are of a size to pass through the openings will be directed to the openings to hasten the sorting action.

From the foregoing description, those skilled in the art will appreciate that numerous modifications may be made of the inventions disclosed without departing from the spirit of my invention. Therefore, I do not intend to limit the breadth of my invention to the specific embodiments illustrated and described, but rather, it is my intention that the scope of my invention be determined by the appended claims and their equivalents.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A coin sorter comprising a plurality of coaxial drums of different sizes nested one within the other, means interconnecting each of the drums and for rotating the drums about their common axis, each of said drums having a substantially cylindrical wall made up of a series of connected flat panels extending in an axial direction from one end of the drum to the other, a lattice of perforations formed in the walls of the drums and each perforation being formed from openings in two adjacent panels, said perforations varying in size from drum to drum with the innermost drum having the largest perforations, and means for directing coins to be sorted into the innermost drum.

2. A device as defined in claim 1 further characterized by the common axis of the drums being at an angle to the horizontal whereby coins in the drums slide in the direction of their lower ends as the drums rotate.

3. A coin sorter comprising a plurality of coaxial drums of different sizes nested one about the other, means for rotating the drums about their common axis, and means for introducing coins to be sorted into the central drum of the nest, each of said drums being made of a cylindrical wall covered with perforations, the perforations in each drum being of uniform size and different in size from the perforations in the other drums, said cylindrical walls being bent into flat sections extending parallel to the axes of the drums and with each perforation being intersected by one of the bends.

4. A device as defined in claim 3 further characterized by the axes of the drums being inclined to the horizontal and the coins being introduced at the higher end of the centrally located drum, and ribs extending circumferentially about the inner wall of each drum immediately adjacent the lower side of the perforations.

5. In a coin sorting machine, a drum having a cylindrical wall covered with circumferential and longitudinal rows of perforations, said wall being bent along longitudinal lines which intersect the longitudinal rows of perforations, and ribs secured to the inside of the drum and extending circumferentially about the drum immediately adjacent one side of the circumferential rows of perforations.

6. A device as defined in claim 5 further characterized by said drum being inclined and with the ribs lying immediately adjacent the lower side of the circumferential rows of perforations.

7. A device as defined in claim 5 further characterized by the bends providing the wall with the saw-tooth-shaped circumferential cross section and with the longitudinal rows of perforations being intersected by the bends more remote radially from the axis of the drum.

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