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3,047,124

EXAMINING APPARATUS

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2 Sheets-Sheet 1

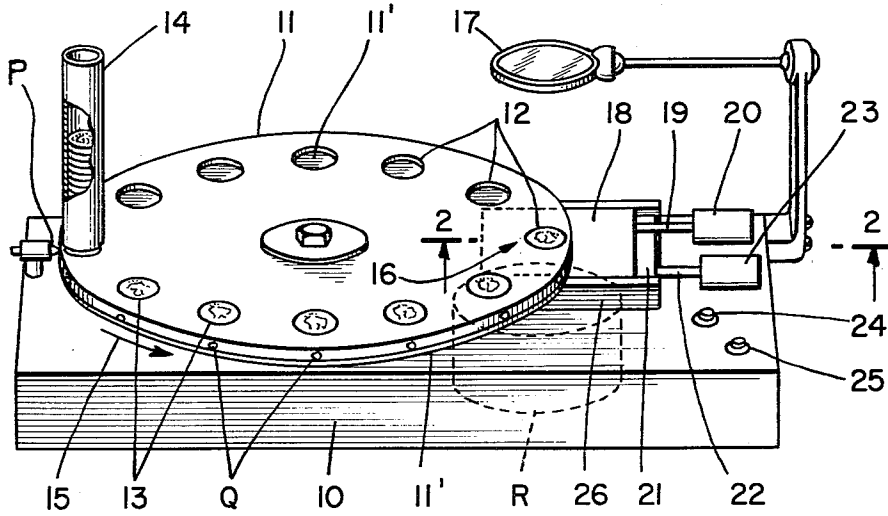


Fig. 1.

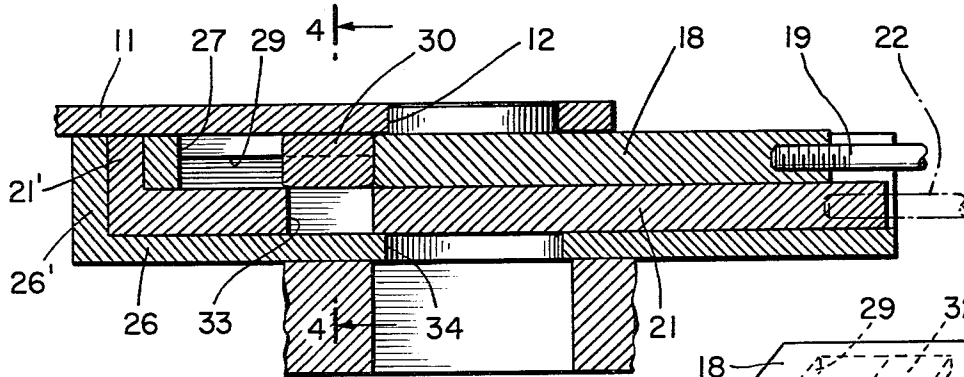


Fig. 2.

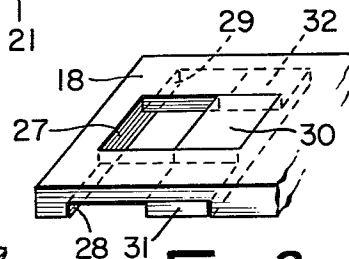


Fig. 3.

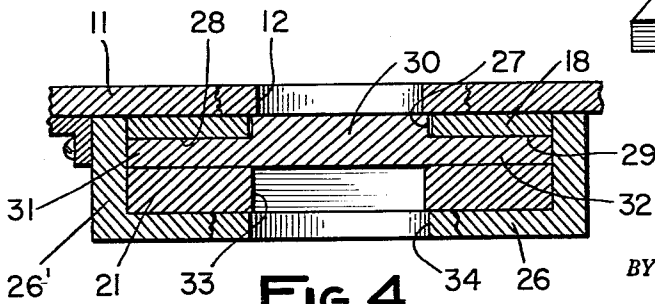


Fig. 4.

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2 Sheets-Sheet 2

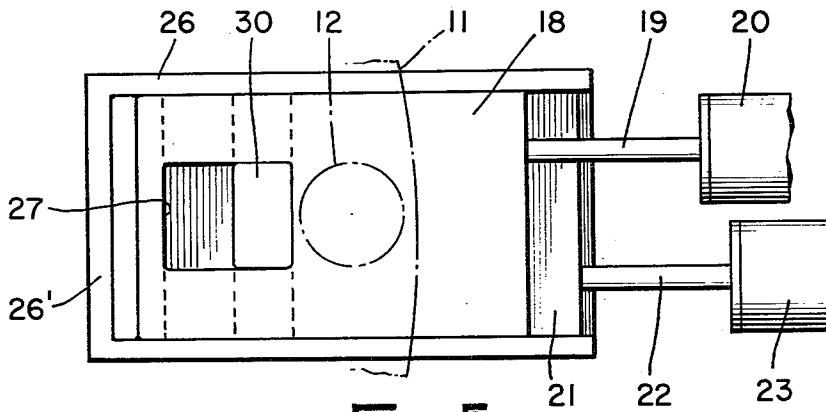


FIG. 5.

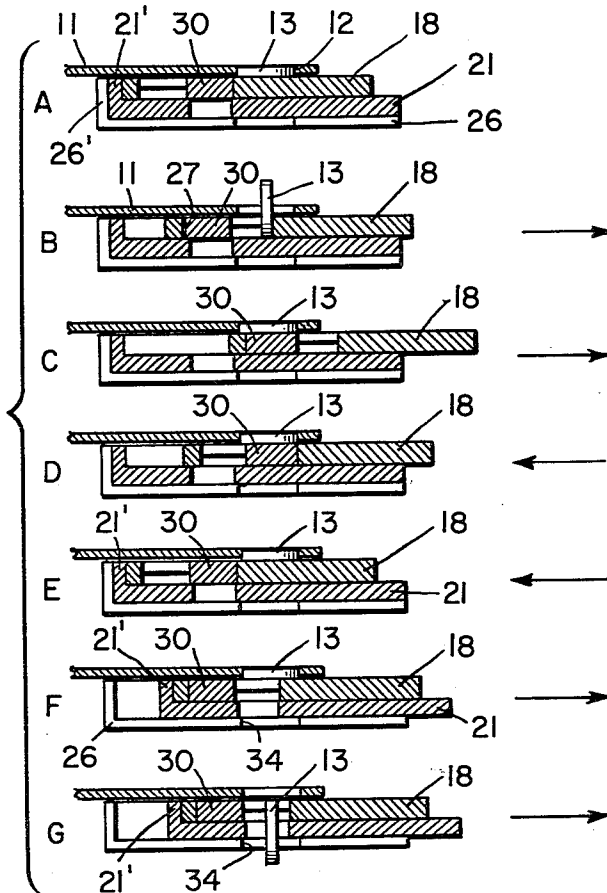


FIG. 6.

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This invention relates to a novel examining apparatus and more particularly to an apparatus for facilitating the examination of objects such as coins by numismatists although not limited to this particular field.

In attempting to segregate a large number of coins by date or by any other particular characteristic feature, each coin from a group must be examined individually, usually on both sides. Such coin examining and separation into sub-groups is facilitated somewhat by spreading all of the coins over a flat surface and assigning a certain area on the surface for coins after each has been examined. There is still the possibility, however, of dropping coins or otherwise fumbling the same which renders the process of examining both sides relatively time consuming.

With the foregoing in mind, it is a primary object of this invention to provide a novel apparatus which enormously simplifies the examination and grouping of coins.

More particularly, it is an object to provide a coin examining apparatus in which a series of individual coins may be successively examined on both sides and separated or discarded into one or more specific containers without the necessity of the operator physically touching the coins.

Other objects of the invention are to provide a novel coin examining apparatus which is relatively simple in overall construction, can either be manually or electrically operated, and which occupies relatively little space as compared to that conventionally required if a large number of coins are to be examined.

Briefly, these and many other objects and advantages of this invention are attained by providing a basic conveyor means including a hopper or chute into which several hundred coins may be placed. The conveyor means cooperates with the hopper in such a manner as to successively remove coins therefrom and reposition them in a given position for examination. Also cooperating with the conveyor means is a coin flipping structure either manually or electrically operable to turn the coin over so that its opposite side may be examined. Finally, there is provided a coin discarding mechanism preferably forming common parts with the coin flipping structure such that upon its actuation, the coin after examination may be passed to a collection chamber or other type container. This latter structure may also be either manually or electrically operated.

A better understanding of the invention as well as various further features and advantages will be had by now referring to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIGURE 1 is a schematic perspective view of the coin examining apparatus of this invention;

FIGURE 2 is an enlarged cross section of the coin flipping and discarding mechanism taken generally in the direction of the arrows 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary perspective view of certain of the operating components of the structure of FIGURE 2;

FIGURE 4 is another cross section taken in the direction of the arrows 4—4 of FIGURE 2;

FIGURE 5 is a top plan view of the structure shown in FIGURE 2; and,

FIGURE 6 is a series of diagrams showing successive operating positions of various movable components for effecting the flipping over and discarding of coins in accordance with the invention.

Referring first to FIGURE 1, there is shown a basic

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supporting structure such as a table 10 mounting a conveyor means in the form of a rotatable turntable 11. Immediately beneath the turntable 11 there is provided a stationary flat surface 11'. As shown, the turntable 11 includes a plurality of coin receiving openings 12. The bottoms of these openings are normally closed off by the flat surface of the stationary plate 11' disposed beneath the turntable 11. The coin receiving openings themselves are of a depth corresponding substantially to the thickness of coins 13 to be examined.

As shown at the left end of the turntable 11, there is provided a hopper or chute 14 containing a plurality of the coins 13. If the turntable 11 is caused to rotate in a counter-clockwise direction as indicated by the arrow 15, it will be evident that as each of the openings 12 register with the underside of the chute 14, a coin will be picked up one at a time to be successively moved towards the diametrically opposite portion of the turntable.

At this diametrically opposite portion there is provided a given examining position designated by the arrow 16. A magnifying glass 17 may be provided over the area 16. The turntable 11 is indexed to be held in positions in which the openings 12 are opposite the arrow 16. Such means may include an indexing plunger P biased to be received in small indent openings Q in the side periphery of the turntable 11 as shown to the left of the hopper in FIGURE 1.

As indicated by the dotted lines, a portion of the flat surface 11' beneath the turntable is cut out to accommodate the top surface of a coin flipping slide plate 18 which top surface is coplanar with the top surface of the stationary plate 11'. The slide plate 18 is adapted to be moved back and forth by a plunger 19 and solenoid coil 20.

Beneath the slide plate 18 there is provided a coin discarding plate 21 similarly movable in a back and forth motion by a second plunger 22 and a second cooperating solenoid coil 23. Movement of the plates 18 and 21 may be individually effected by switch buttons 24 and 25 respectively wired to energize the solenoids 20 and 23. Alternatively, these plungers may be manually operated if desired.

As shown in FIGURE 1, the slide plate 18 and discarding plate 21 are guided in their back and forth movement by a box shaped guide structure 26. Beneath the guide structure 26 there is provided a coin receiving container R for receiving discarded coins. The arrangement is such that various coins 13 received in the openings 12 may be successively positioned beneath the magnifying glass 17. Their top sides can then be examined and upon actuation of the flipper slide plate 18, their opposite sides can be examined. After both sides have been examined, the discarding slide plate 21 may be actuated to pass the coin to the container R.

A better understanding of the coin flipper and discarding mechanism will be had by referring to FIGURES 2, 3, and 4. As shown, the flipper slide plate 18 includes a rectangular cut-out control opening 27 including laterally recessed channel portions 28 and 29. The control opening 27 is arranged to receive the upper portion of a slide block 30 having reduced lateral portions 31 and 32 movable within the recessed channel portions 28 and 29 on the underside of the slide plate 18. The bottom surface of the slide block 30 is seated on the top surface of the discarding plate 21, this top surface serving to hold the slide block in position.

As shown in both FIGURES 2 and 4, the discarding plate 21 includes a coin releasing opening 33. This coin releasing opening 33 cooperates with the rectangular control opening 27 in the slide plate 18 and with a further opening 34 in the bottom of the guide structure 26 for dropping coins entirely through the mechanism to the

receiving container R of FIGURE 1, all as will become clearer when the operation of the device is described.

FIGURE 5 illustrates the structure of FIGURES 2 and 4 in the plan view. It will be noted that the width of the rectangular opening 27 corresponds substantially to the diameter of the coin receiving opening 12. The thickness of the slide plate 18, as best seen in FIGURE 2, in turn, is dimensioned to be slightly less than the radius of any coin received with the opening 12.

With the foregoing description of the various components in mind, the operation of the coin flipping and discarding mechanism can best be understood by referring to the series of diagrams A through G of FIGURE 6. Thus, as shown in diagram A, the coin 13 is positioned by the turntable 11 for examination of the top side thereof. In this normal position, the slide plate 18 and the discarding plate 21 are moved to their extreme leftward position. The discarding plate 21 includes an upturned end flange 21' against which the rear edge of the slide plate 18 rests. The supporting guide structure 26 also includes an end 26' which limits the leftward movement of the discarding plate 21.

Referring now to diagram B, and assuming it is desired to flip the coin so that the other side thereof may be examined, the slide plate 18 is moved to the right by means of the plunger 19 and solenoid coil 20. As the slide plate moves towards the right, the slide block 30 will at first remain stationary because of the frictional engagement of its reduced lateral portions with the sides of the guide structure 26. However, when the end of the rectangular opening 27 engages the block 30 it will then commence sliding the block 30 to the right. In the particular position illustrated at B, the partial registration of the control opening 27 with the coin receiving opening 12 results in the coin 13 falling into a vertical position as shown. Further movement of the slide plate 18 to the right will result in the right-hand edge of the slide block 30 engaging the opposing side of the coin 13 to turn it over so that the coin will then rest on top of the slide block 30 as clearly illustrated in diagram C.

The slide plate 18 may then be returned to the left and in moving from the position illustrated in diagram C to the position illustrated in diagram D, it will be seen that the slide block 30 will remain in its new position to support the coin 13 until the front end of the control opening 27 engages the right-hand side of the slide block. The entire slide block is then moved to the left as shown in the step from diagram D to diagram E and the upper surface of the slide plate 18 will then support the coin 13, the various components being returned to the position shown in diagram A. The coin 13 however will have its opposite side exposed for examination.

Repetition of the various steps A through E will result in the coin again being flipped to expose its initially upwardly facing side.

When the examination of the coin 13 has been completed and it is desired to discard the same, the discarding plate 21 is moved to the right as indicated in diagram F. Because of the end flange 21', the slide plate 18 will also be moved. Again, because of friction, the slide block 30 will remain stationary until engaged by the front edge of the control opening 27 and in the relative positions illustrated in diagram F, it will be noted that the control opening 27 and the coin releasing opening 33 are moved towards registration with each other and the coin receiving opening 12.

When the discarding plate 21 is moved all the way to the right as shown in diagram G, these various openings are in alignment so that the coin 13 simply drops through the openings into the container R of FIGURE 1. Return of the discarding plate 21 will result in the various elements assuming their original positions shown in diagram A. Preferably, the plungers 19 and 22, as shown in FIGURE 5, are normally biased to the left so that electrical energy is required to effect the right-hand motion.

It will be evident from the foregoing description, accordingly, that several hundred coins may be successively examined with considerably rapidity and facility. If desired, additional coin discarding plates with corresponding guide structures may be provided at other positions about the turntable 11 of FIGURE 1 and other cooperating containers R disposed therebeneath. By providing additional control buttons, after examination of a particular coin, if it is not desired to discard it in the container R, it may be discarded in a subsequently positioned container through the additional discarding mechanism so that the various coins may be grouped into several different sub-groups.

The turntable of FIGURE 1 may be manually rotated and positioned by the aid of the indexing means P and Q for proper successive examination. Alternatively, an electric motor could be provided for stepping the turntable under control of additional switches.

Various other additional features and modifications can be provided. All such additions, changes, and substitution of equivalent operating systems are deemed to fall within the scope and spirit of this invention. Thus other objects shaped similarly to coins could be examined. The novel examining apparatus is therefore not to be thought of as limited to the particular embodiment or to the specific example of coins set forth merely for illustrative purposes.

What is claimed is:

1. A coin examining apparatus for enabling the successive examination of a series of coins, comprising, in combination: hopper means for holding said coins; conveyor means for successively moving individual coins from said hopper means to a given location for examination of one side; flipping means for turning over each coin and repositioning it in said same location for enabling examination of its other side, said conveyor means including a flat surface having a member movable thereover, said member including a coin receiving opening of depth corresponding substantially to the thickness of said coin, said flipping means including a guide structure having a coin flipper slide plate, the top surface of said plate being coplanar with said flat surface and positioned such that said coin receiving opening passes thereover, said plate including a control opening; means for moving said plate from a first position in which its top surface supports the bottom of said coin to a second position in which said control opening is disposed beneath said coin receiving opening; and a slide block having a thickness corresponding to the thickness of said plate positioned in said control opening and movable from one side of said control opening to the other when said plate is moved from said first position to said second position, whereby movement of said slide plate towards said second position permits an edge of said coin to fall into said control opening, said slide block then engaging the opposing side of said coin to cause it to fall onto the top of said slide block in a turned over position, return of said slide plate returning said slide block to its initial position; collecting means; and discarding means for passing each coin to said collecting means after examination thereof.

2. A coin examining apparatus according to claim 1 in which said discarding means includes: a discarding plate having a coin releasing opening therein positioned under said slide plate, the top surface of said discarding plate covering the bottom of said control opening when said discarding plate is in a first position; and means for moving said discarding plate to a second position in which said releasing opening registers with said control opening, said discarding plate including coupling means for engaging and moving said slide plate to position both said control opening and said releasing opening in a third position under said coin receiving opening whereby movement of said discarding plate from said first to said third position will pass said coin through said control and releasing

openings, said collecting means comprising a collecting container disposed beneath said releasing opening.

3. A coin examining apparatus according to claim 2, in which said means for moving said slide plate and said means for moving said discarding plate comprise solenoids having their plungers connected respectively to said plates;

and switch means for enabling individual operation of said solenoids.

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