April 7, 1953 B. P. ROBINSON 2,633,970

PRODUCE-HANDLING APPARATUS

Filed Jan. 18, 1951 2 SHEETS—SHEET 1

Fig. 1.

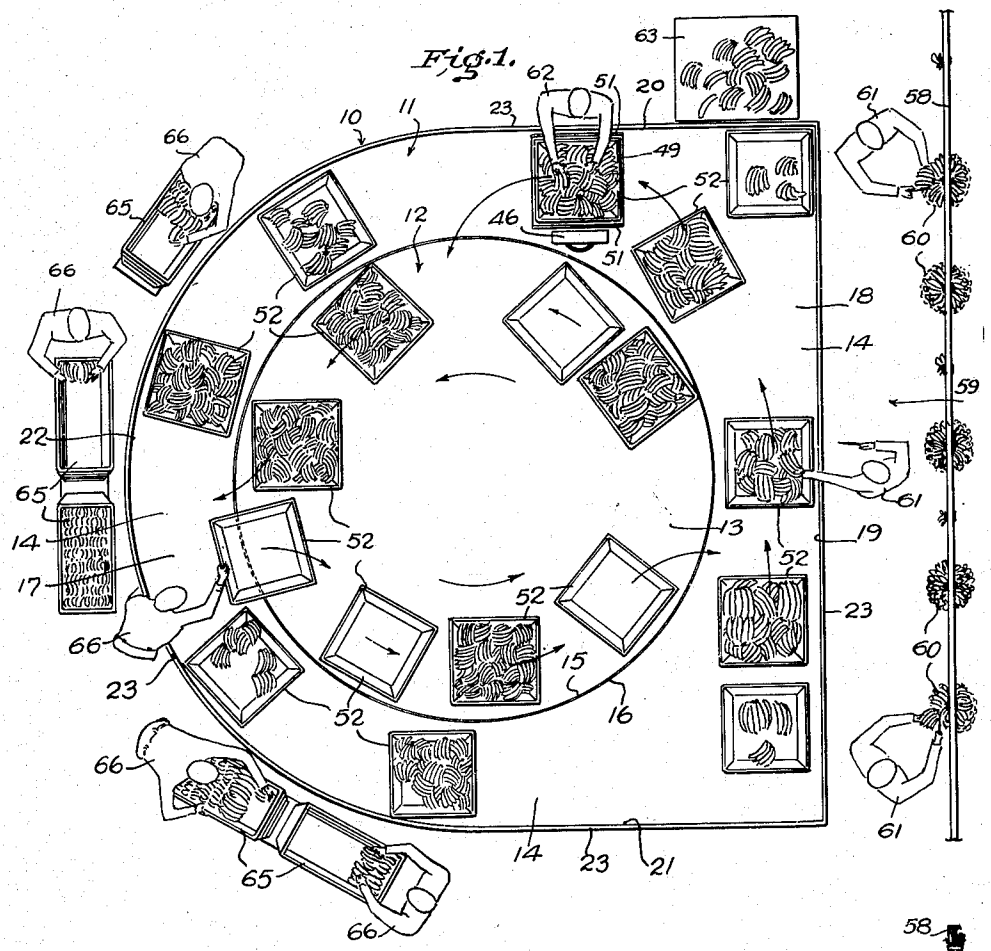


Fig. 2.

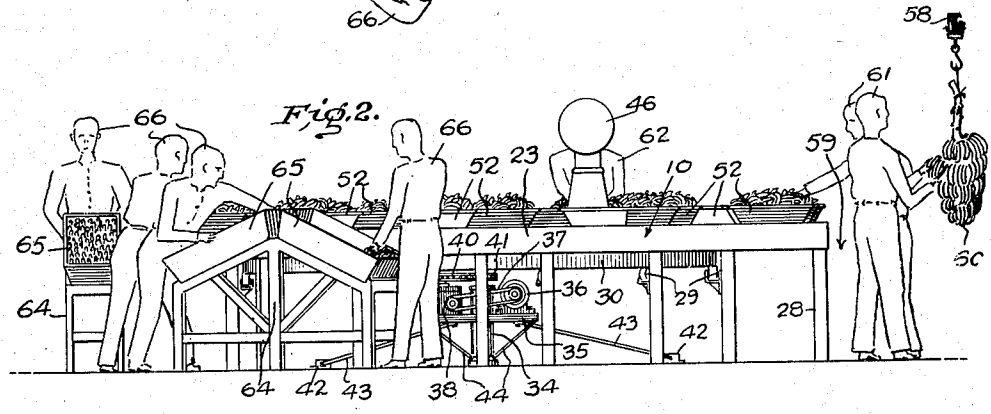
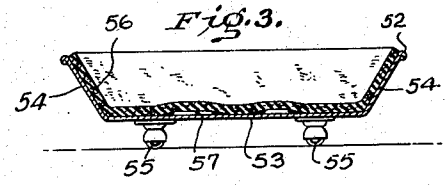


Fig. 3.



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Fig. 4.

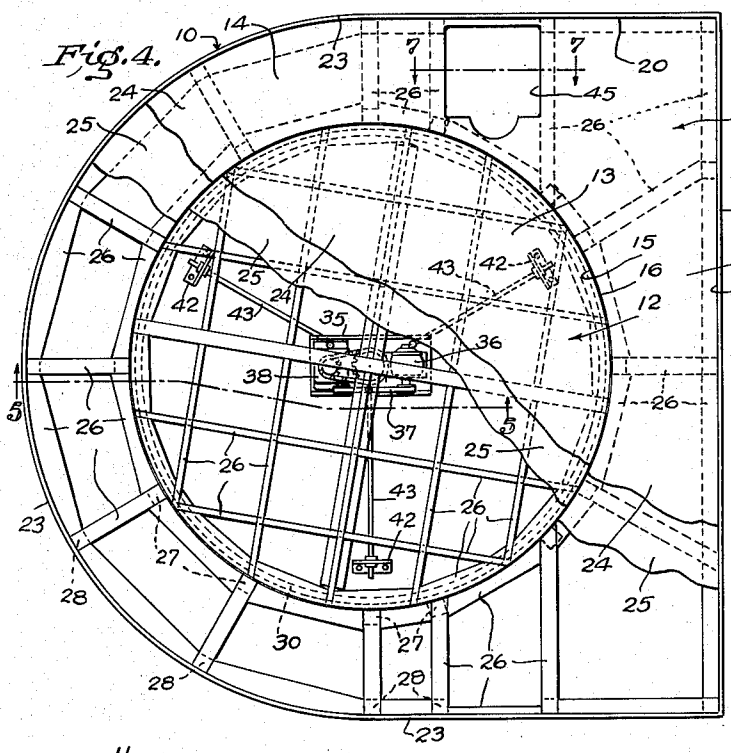


Fig. 7.

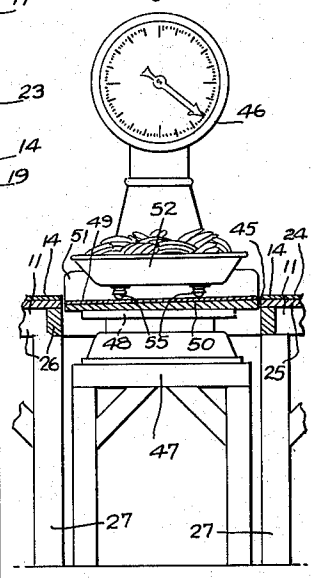
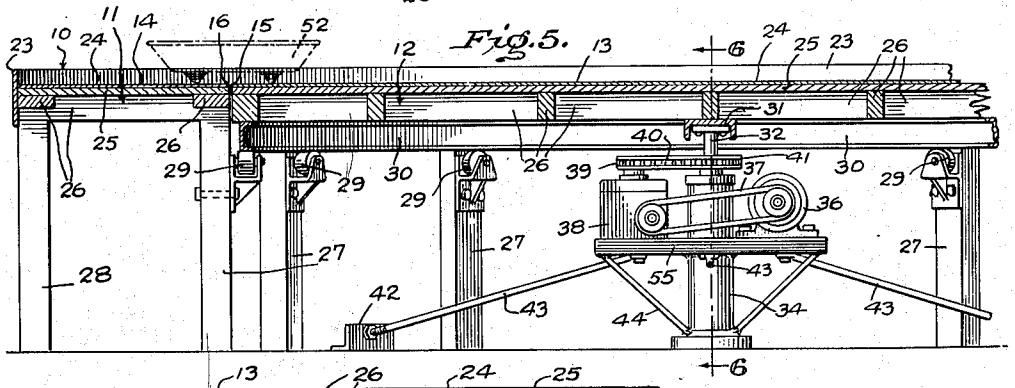


Fig. 5.



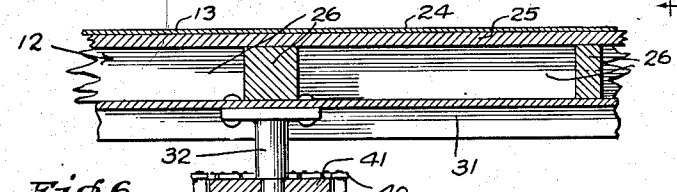
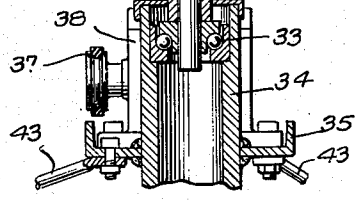


Fig. 6.



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PRODUCE-HANDLING APPARATUS

Bell P. Robinson, Flint, Mich.

Application January 18, 1951, Serial No. 206,650

4 Claims. (Cl. 198—19)

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The present invention relates to produce-handling tables used by wholesalers in packing perishable produce, and aims to provide a novel and improved apparatus of this character especially applicable in grading, weighing, and packing hands of bananas in boxes for shipment to retailers.

Since introduction of the present method where the wholesaler separates and prepares bananas in hands for retail display and sale, wholesalers are required to pack graded hands of bananas of substantially the same ripeness in special nesting boxes, each when filled, having a net weight of approximately thirty-five pounds. Produce of this nature is not susceptible to complete handling by machinery, and for that reason requires a large number of operators to cut hands of bananas from stalks, remove undersized or otherwise undesirable bananas from the hands, and pack the same weight of bananas in each box. The present practice is to use a relatively large rectangular table with a retainer wall around a flat stationary working surface extending entirely across the table on which both empty trays and trays filled with bananas are slid to and from different operators, empty trays being pushed by the packers towards the cutters, while the cutters push filled trays towards the weighers who in turn shove the weighed trays in the general direction of the packers. The direction and distance of travel of the trays are solely dependent upon the skill of the operators to place the trays at the termination of their travel within reach of the operators having use therefor. This method of handling trays results in considerable damage to the trays and spilling of their contents due to collision of the trays and the slamming of same against the retainer wall.

It, therefore, is an object of this invention to provide a produce-handling table having an outer stationary table structure around which a number of operators are positioned for filling trays, weighing trays, and packing boxes with produce from filled trays; and a slowly rotatable turntable arranged centrally of and flush with the stationary table structure onto which both filled and empty trays are rolled to be conveyed to positions within reach of operators who require them.

Another object of this invention is the provision of a large capacity produce-handling table which occupies a particularly small amount of space and at the same time provides convenient and comfortable working conditions for a considerable number of operators.

Another object of the invention is to provide

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a produce-handling table as outlined above wherein a scale has the upper surface of its weighing platform associated with the tray-rolling surface of the stationary table structure in a manner and in accordance with the direction of movement of the trays for permitting filled trays to be rolled onto and off of the platform of the scale without riding over a raised obstruction.

A further object of the invention is to provide a produce-handling table as above set forth having an outer stationary structure completely surrounding the central rotatable turntable, said stationary table structure having substantially one half of its working surface semicircular and the other half rectangular at its outer sides providing a relatively long, straight side with right angled short, straight sides extending from its ends which merge into the outer sides of the semicircular portion, and having a weighing scale located in the work surface of the stationary section along at least one of said short, straight sides.

A still further object of the invention is to provide a rotatable turntable arranged in a circular opening in a stationary table section with the work surfaces of both tables on the same horizontal plane and flush with one another and with a lateral adjustment for the turntable to position the same directly in the center of the circular opening with edges of said opening evenly spaced from and in close proximity to the periphery of the turntable.

It is also an object of the invention to provide an apparatus of the above-indicated character which is substantial in construction and thoroughly efficient and practical in use.

These, together with various auxiliary features and objects of the invention which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a plan view of the improved table showing operators performing the different tasks in processing the produce;

Figure 2 is a side elevation of same;

Figure 3 is a vertical cross section through one of the trays;

Figure 4 is a plan view of the table with portions thereof broken away to show parts therebeneath;

Figure 5 is a fragmentary vertical section taken substantially on line 5—5 of Figure 4;

Figure 6 is a similar section taken on line 6—6 of Figure 5; and

Figure 7 is also a fragmentary vertical section taken on line 7—7 of Figure 4 showing a weighing scale associated therewith.

Referring now more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, the numeral 10 generally indicates the improved produce-handling table, including a stationary outer table structure 11 surrounding a central conveying turntable 12 provided with a top surface 13 arranged on the same horizontal plane and flush with a working surface 14 on the stationary table structure 11. The flat top surface 13 of the turntable 12 is of a circular formation and has the peripheral edge 15 thereof adjacent and slightly spaced from a circular opening 16 in the work surface 14 of the table structure 11.

Substantially one half of the working area of the stationary table structure 11 is semicircular, as at 17, while the other half is rectangular at its outer sides, as at 18, providing a relatively long, straight side 19 with right-angled, short, parallelly spaced sides 20 and 21, all of which would have been tangent to an imaginary line continuing the outer curved edge 22 of the semicircular portion 17 to make a complete circle. Along the curved edge 22 and straight edges 19, 20, and 21 is a retainer wall 23 completely surrounding and projecting above the working surface 14 of the stationary table structure 11.

The table tops of both the stationary table structure 11 and the turntable 12 are constructed of heavy plate metal 24 which is attached on the upper surface of plywood 25 which in turn is supported on horizontally extending structural members 26 connected together to form rigid frames. Both inner and outer legs 27 and 28, respectively, attached to the structural members 26 of the frame of the stationary table section rest on the floor of the building housing the apparatus and support the table top of the stationary table section at the proper elevation for convenient work thereon.

The inner legs 27 also support the table top of the turntable 12 at the same horizontal elevation as the table top of the stationary table section 11 by having attached thereto rollers 29 on which rests and rides an annularly formed channel section 30 secured to the underside of the frame of structural members 26 of the turntable. Also secured to the underside of the frame of structural members 26 of the turntable is a horizontally extending channel section 31 which terminates slightly short of the annular channel section 30 and to the center of which is secured a depending shaft 32 journaled by a combination radial and thrust bearing 33 in the upper end of a tubular pedestal 34 which has its lower end resting upon and secured to the floor.

On the pedestal 34 spaced above the floor is rigidly attached by welding or the like a platform 35 constructed of a heavy channel section which extends to opposite sides of the pedestal and supports on one extended end thereof an electric motor 36 which drives through a belt and pulley arrangement 37 a speed reducing mechanism 38 supported on the other extended end of the platform 35. Projecting upwardly from the speed reduction mechanism 38 and parallel to the shaft 32 is a drive shaft upon which is secured a sprocket gear 39 that drives a sprocket chain 40 which it also arranged around another sprocket gear 41 fixed to the shaft 32. The speed reduction mechanism 38 and size of sprockets 39 and 41 in the drive connection between the electric motor 36 and turntable 13 rotate the turntable at a very slow rate of speed on the supporting rollers 29, while the bearing 33 supports the turntable against lateral movement during its rotation.

Attached to the platform 35 and anchored by angle irons 42 to the floor upon which the apparatus rests are three adjustable stay rods 43 that can be lengthened or shortened for forcing the upper end of the pedestal in directions whereby the peripheral edge 15 of the metal top surface of the turntable 12 is properly spaced from the edge of the circular opening 16 in the metal plate of the stationary table structure 11. Angled braces 44 rigidly secured to the platform 35 and to the lower end of the pedestal 34 prevent movement of the platform with respect to the pedestal.

A substantially rectangular opening 45 is provided in the metal top 24 and plywood 25 of the stationary table structure 11 adjacent the short, straight side edge 20 thereof and between horizontally extending structural members 26, as shown in Figures 4 and 7, into which is arranged a weighing scale 46 supported on an auxiliary table 47 located within the stationary table structure 11. Supported on the weighing platform 48 of the scale 46 is a metal plate 49 arranged at a slight angle off of a horizontal plane by the positioning of a tapered member 50 between the platform 48 and said plate. The elevation of the metal plate 49 is such that the edge thereof nearest the long, straight side edge 19 of the stationary table structure 11 is slightly lower than the top surface of the table structure 11 when the weighing scale 46 is empty, and the opposite parallel side edge of the metal plate 49 is higher than the top surface of the table structure 11 when the weighing scale 46 has the correct weight of produce thereon. The other parallel sides of the plate 49 are turned upwardly at substantially right angles providing side walls 51.

Trays, designated generally by the numeral 52, are adapted to be rolled on the top surfaces of the stationary table structure 11, turntable 12, and plate 49 on the weighing platform of the scale, and from one surface to another. Trays found practical for use with the improved table are rectangular in shape with a bottom wall 53 and slanting side walls 54, and of a size for holding approximately 35 pounds of bananas. On the underside of the bottom wall 53 of each tray are attached four evenly spaced ball-type casters 55 which ride on the top surfaces of the members 11, 12, and 49 when pushing the trays onto and off of the different members. The interior banana-supporting surfaces of the walls of the trays 52 are lined with a layer of thick sponge rubber 56, as shown in Figure 3, and under the rubber are placed weights 57 to cause all empty trays to weigh the same. The scale 46 is adjusted to indicate "zero" when any one of the empty trays is placed on the platform thereof.

An overhead track 58, or any other means of conveying stalks of bananas, extends along and is spaced from the long, straight side 19 of the stationary table structure 11, as shown in Figures 1 and 2, providing a working space 59 between the stalks of bananas 60 suspended from the track and the side of the table where cutters, indicated by the numeral 61, are stationed to cut hands of bananas from the stalks and place the hands in trays.

Near a corner of the stationary table structure 11 and within reach of the weigher 62 is located

a small table 63 on which a small supply of bananas is kept for use in making up the required weight of bananas in trays and on which bananas from trays of overweight are deposited during the weighing operation.

Around the outer side of the semicircular portion 17 of the stationary table structure 11 are positioned a number of stands 64 arranged both singly and in duplicate for supporting boxes 65 on angles, as shown in Figure 2, for convenience of packers 66 when packing the boxes with hands of bananas.

In operation, the electric motor 36, through the belt and pulley drive connection 37, speed reducing mechanism 38, and sprocket gears and chain arrangement, rotates the turntable 12 at a rate of speed to permit trays 52 to be rolled thereon from the stationary table structure 11, conveyed thereby, and rolled therefrom onto said stationary table, thus conveying filled trays to the packers 66 and empty trays to the cutters 61.

The cutters lined up along the long, straight side 19 of the stationary table structure 11, reach empty trays on the turntable 12 and pull same onto the stationary table structure 11 to positions next to the retaining wall 23, whereupon hands of bananas cut from the stalks 60 are laid in the rubber-lined trays until approximately thirty-five pounds of bananas are placed in each tray. The cutters then roll the filled trays on the stationary table structure to positions within reach of the weigher 62 who rolls the trays onto the angled plate 49 on the weighing platform of the scale 46 and removes bananas from the trays or places additional bananas from the table 63 into the trays to obtain the correct weight. Upon completion of each weighing operation, the weigher 62 rolls the weighed tray from the scale over the stationary table structure and onto the revolving turntable 12 where the tray continues to be rotated until a packer 66 has use therefor.

A packer 66, upon removing the bananas from a tray during the packing of a box 65, pushes the empty tray onto the turntable and pulls a filled and weighed tray from the turntable onto the stationary table structure to a position which is convenient to remove the bananas therefrom a hand at a time while packing same in a box 65. The empty trays that are returned by the packers to the turntable may also remain thereon and be continually rotated by the table until a cutter 61 has use for an empty tray and rolls same onto the stationary table structure to again be filled with bananas.

By providing a disk-shaped turntable 12 having a flat surface extending entirely thereacross and using only the marginal portion thereof for the conveyance of filled and empty trays, the central portion of the turntable serves as temporary storage space for several extra trays which can readily be put to use should there be a need for same. This temporary storage space aids in the efficient operation of the apparatus, especially when a smaller number of workers are employed than normally used. Rods with hooks thereon, not shown, are provided at locations around the table for manual use when necessary in engaging trays beyond reach of the workmen.

The proportion of operators—three cutters, one weigher, and five packers—as shown in Figure 1 works very satisfactorily; however, the table is constructed so that the number of different workers may be either decreased or increased with operation continuing with the same degree of efficiency. Should an additional weigher be required, a space is provided along the short, straight side 21 for another weighing scale by merely cutting another rectangular opening in the metal plate top 24 and plywood 25 directly opposite the rectangular opening 45, the structural members 26 having been arranged so as not to be disturbed by the provision of this additional opening.

While bananas have been referred to as the produce that the improved apparatus is especially intended to handle, it is to be understood that the apparatus may be efficiently used in sorting, weighing, and packing other perishable produce or articles that lend themselves to this method of handling.

The constructional form above described and illustrated in the drawings is only to be regarded as an example, and its details may, of course, be modified in several ways without departing from the principle of the invention.

What is claimed is:

1. A produce-handling apparatus comprising: a stationary table structure having a smooth, unobstructed, flat top surface with a relatively large, circular opening therein; a turntable having a disk-shaped, smooth, unobstructed, flat top surface arranged on the same horizontal plane as the top surface of the stationary table structure and having the peripheral edge thereof adjacent and flush with the edge of said circular opening; a retainer wall projecting above the top surface of said stationary table structure at outer sides thereof; said stationary table structure having a second opening in the top surface thereof to one side of said first-mentioned opening and of less size; a weighing scale arranged in said second-mentioned opening with the top surface of the weighing platform thereof at an angle to the horizontal plane of the stationary table structure and with one side edge of the weighing platform below the horizontal plane of the top surface of the stationary table structure and another side edge of said platform arranged above the horizontal plane of the top surface of said table structure; and means for rotating said turntable at a slow rate of speed.

2. A produce-handling apparatus comprising: a stationary table structure having a smooth, unobstructed, flat top surface with a relatively large circular opening therein; a turntable located in said circular opening of said stationary table structure and having a disk-shaped, smooth, unobstructed, flat top surface; rollers carried by said stationary table structure upon which said turntable rests with the flat top surface thereof on the same horizontal plane as the top surface of the stationary table structure; a pedestal below said turntable and arranged centrally of the circular opening in the stationary table structure; means rotatably mounting said turntable in the upper end of said pedestal; means for adjusting the upper end of said pedestal in lateral directions for properly spacing the peripheral edge of the turntable from the edge of the circular opening in the stationary table structure; and means for rotating said turntable at a slow rate of speed.

3. A produce-handling apparatus comprising: a stationary table structure having a smooth, unobstructed, flat top surface with a relatively large, circular opening therein; a turntable located in said circular opening of said stationary table structure and having a disk-shaped, smooth, unobstructed, flat top surface; rollers carried by said stationary table structure upon which said turntable rests with the flat top sur-

face thereof on the same horizontal plane as the top surface of the stationary table structure; a pedestal below said turntable with its lower end mounted on the floor upon which the apparatus rests and arranged centrally of the circular opening in the stationary table structure; means rotatably mounting said turntable in the upper end of said pedestal; adjustable stay rods connected to the upper end of said pedestal and to the floor upon which the apparatus rests for moving and holding the upper end of said pedestal to properly space the peripheral edge of the turntable from the edge of the circular opening in the stationary table structure; and means for rotating said turntable at a slow rate of speed.

4. A produce-handling apparatus comprising: a stationary table structure having a smooth, unobstructed, flat top surface with a relatively large, circular opening therein and having substantially one half of the top surface semicircular and the other half rectangular at its outer sides providing a long, straight side with right-angled, short, straight sides merging into the outer sides of the semicircular portion; a turntable having a disk-shaped, smooth, unobstructed, flat top surface arranged on the same horizontal plane as the top surface of the stationary table structure and having the peripheral edge thereof adjacent and flush with the edge of said circular opening, said stationary table structure having a second opening rectangular in shape in the top surface thereof adjacent a short, straight

side thereof and spaced to one side of said first-mentioned opening; a weighing scale arranged in said second-mentioned opening with the top surface of a rectangular weighing platform thereof arranged at an angle to the horizontal plane of the stationary table structure and with the side edge of the top surface of said platform nearest said long, straight side of said stationary table structure below the horizontal plane of the top surface of said stationary table structure and the opposite side edge of the top surface of said platform above the horizontal plane of the top surface of said table structure; and means for rotating said turntable at a slow rate of speed.

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