Feb. 5, 1957 J. G. COVITT ET AL 2,780,372

ROTATING TABLE DEVICE AND TURNING MEANS THEREFOR

Filed Sept. 7, 1954 3 Sheets-Sheet 1

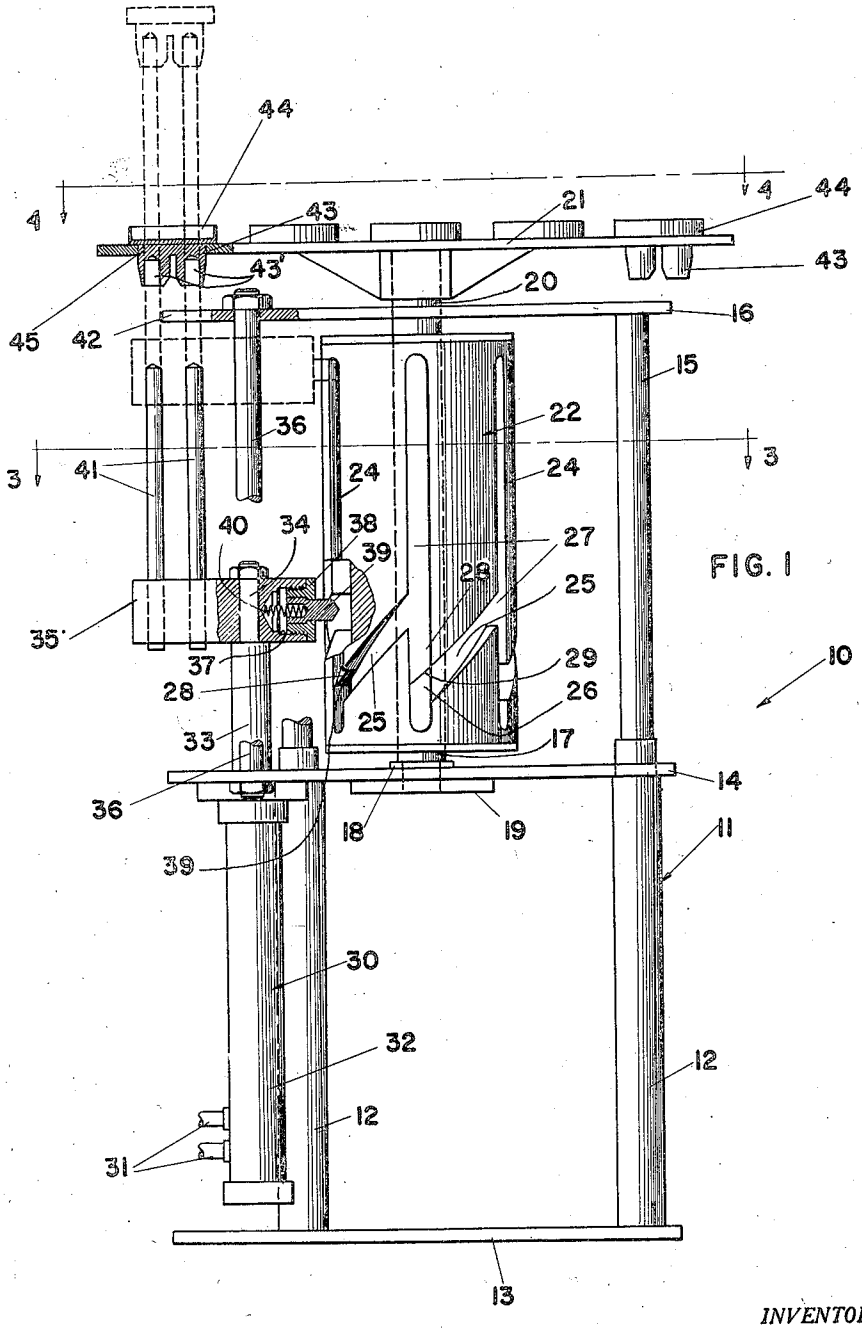


FIG. 1

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Filed Sept. 7, 1954 3 Sheets-Sheet 2

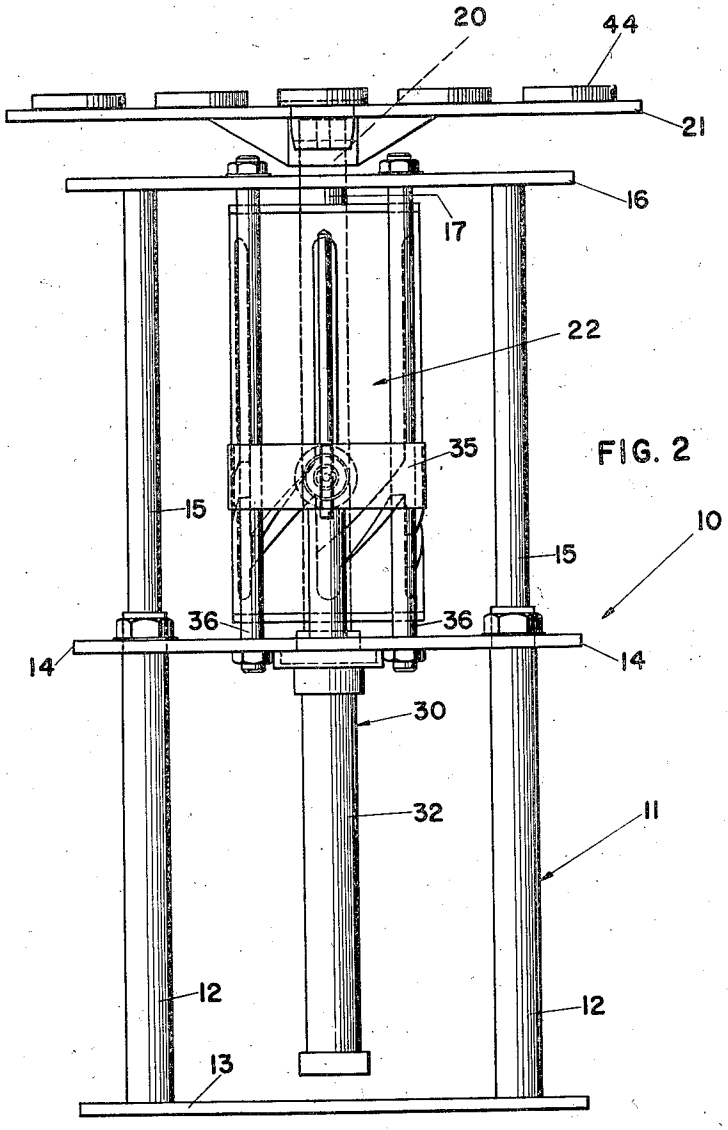


FIG. 2

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Filed Sept. 7, 1954 3 Sheets-Sheet 3

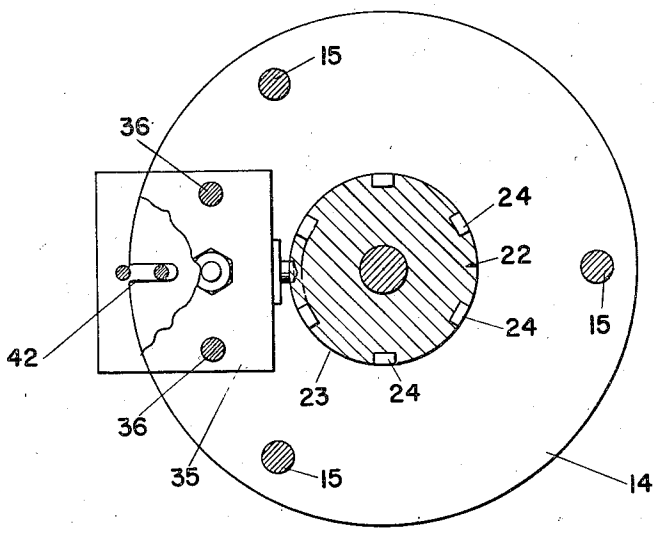


FIG. 3

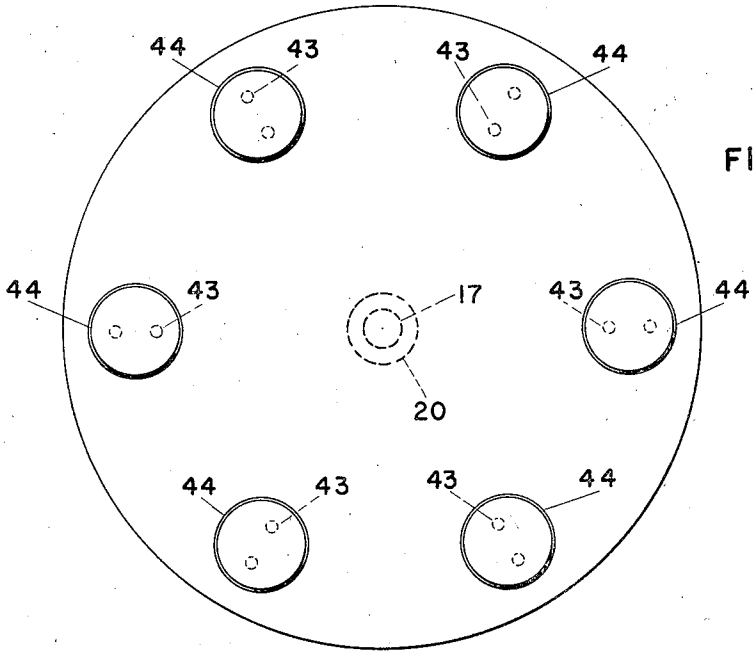


FIG. 4

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ROTATING TABLE DEVICE AND TURNING MEANS THEREFOR

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Application September 7, 1954, Serial No. 454,570

9 Claims. (Cl. 214—89)

This invention relates to an improvement in rotating table devices. More specifically, it relates to means for rotating a table to a number of operating positions.

It is an object of this invention to provide an improved rotating table which may be rotated in sequence to a series of positions, said table including trays carried thereon, and means for moving said trays free of the table at certain intervals.

It is a still further object to provide an improved rotating table having means for rotating the said table at spaced time intervals to a series of positions.

A still further object is to provide an improved rotating table having a plurality of trays positioned thereon, the table being movable by an improved means to a position wherein one of the trays is in alignment with a raising device, the raising device being effective to remove one of the trays from the surface of the table.

These and further objects will become more readily apparent from a reading of the specification when examined in connection with the accompanying sheets of drawings, wherein:

Figure 1 is a side-elevational view, with portions in section, showing an improved rotatable table device;

Figure 2 is a front view in elevation of the rotatable table shown in Figure 1;

Figure 3 is a sectional view of a rotating table device, taken substantially along the line 3—3 of Figure 1; and

Figure 4 is a cross-sectional view taken substantially along the line 4—4 of Figure 1.

Referring now particularly to Figures 1 and 2, a rotatable table device is generally designated by the reference character **10**. The device **10** comprises a supporting structure, generally designated at **11**. The supporting structure **11** includes a plurality of laterally spaced uprights **12** which are suitably connected to a base member **13**. A lower plate **14** is seated upon the uprights **12**, and rods **15** extend upwardly from the plate **14** for supporting an upper plate **16**. A shaft **17** is positioned between the plates **14** and **16**, the shaft being suitably journalled on the lower plate **14** by means of a collar **18** connected to the shaft **17** adjacent one end thereof, the said shaft extending through the lower plate **14** and being suitably connected thereto by means of a nut **19**. The shaft **17** is provided at its upper end with a shaft extension **20** to which a rotatable table **21** is connected.

A rotatable member, or drum, is generally designated at **22**. The drum **22** comprises an outer cylindrical surface having a plurality of slots which are circumferentially spaced and extend in a vertical direction, the slots being designated at **24**. A plurality of spirally shaped, or spirally extending, cam slots **25** are also provided in the outer surface **23**. Each cam slot **25**, as best indicated in Figure 1, has one end, as indicated at **26**, in communication with one of the vertical slots **24**; and its other end, as indicated at **27**, in communication with an adjacent slot **24**. A projecting guide member **28** is provided in each vertical slot **24** adjacent the point of communication **26**.

Each guide member **28** also includes a raised guide surface **29**, as best shown in Figure 1.

A fluid-extensible member **30** is positioned on the plate **14**. The fluid-extensible member **30** may be of a conventional type, suitably supplied by fluid under pressure through conduits **31**. The fluid-extensible member **30** includes a cylinder **32** having a movable ram **33**. The ram **33** is provided with a reduced end portion **34** to which a cam follower support **35** is connected. A pair of laterally spaced guide rods **36** are connected to the plates **14** and **16**, the said guide rods **36** also extending through the cam follower support **35** whereby the said follower may be guided during its vertical movement on the said rods **36**. The cam follower support **35** includes a socket **37** into which a collar **38** is threaded. The collar **38** supports a cam follower **39** which is generally urged by means of a spring **40** in the direction of the rotatable member **22**. A pair of upwardly extending fingers **41** are securely connected to the cam follower support **35**. The fingers **41** are adapted to be moved upwardly upon raising of the ram **33** through a slot **42** provided in the upper plate **16**.

As the fingers **41** move upwardly, they will engage a pair of laterally spaced receiving elements **43**, suitably apertured, as indicated at **43'**, so that the ends of the fingers **41** may enter the said apertures **43'** in telescoping relation. The receiving elements **43** are connected to a plurality of removable trays **44** nesting within openings **45** circumferentially disposed in the table **21**.

The rotating table device, above disclosed, is particularly useful in adaptations where it is desirable to move a tray, or other receptacle, into position for receiving fluids, finely divided materials, etc. Thus, the machine can be used in cases wherein, at a given time, the tray is removed from the rotating table and into position for receiving a desired element. Assuming now that it is desired to move the table **21**, as shown in Figure 1, in a clockwise position, the piston arm **33** is moved upwardly. The cam follower **39** has moved below the guide member **28** so that upon further upward movement of the piston arm **33**, the cam follower **39** is directed to enter into one of the cam slots **25**. Further upward movement of the cam follower support **35** and the cam follower **39** causes rotation of the drum, or rotatable member, **22** wherein one of the trays is moved into position, or vertical alignment, with respect to the fingers **41**. Thus, in other words, the rotatable table **21** has now being rotated, or indexed, into position wherein one of the removable trays is in alignment with the fingers **41**. Further upward movement of the piston arm **33** causes upward movement of the fingers **41** until they engage the receiving elements **43** of the particular tray which is in alignment with the fingers. The fingers **41**, during the upward movement, thus serve to lift the tray **44** out of the opening **45** in which it is seated. Thus the tray **44**, which is engaged by the fingers **41**, is moved upwardly, as shown in the dotted lines of Figure 1. After material has been directed to the tray **44**, it is then desired to lower the fingers **41**, and suitable valve means (not shown) is actuated to lower the piston rod, or ram, **33**. The piston rod **33** thereupon lowers the fingers **41** whereupon the tray is again seated within its particular opening **45**. Downward movement of the follower **39** occurs within the particular slot **24** within which it is positioned. It can be seen that the guide surface **29** is in the same plane as the walls of the spirally shaped cams **25**. The guide member **28** also is raised relative to the bottom of the slot; and as the follower moves downwardly in the slot **24**, it rides on the guide member **28**, beyond the said guide member, and into the lower portion of the respective slot **24**. Now, during the next upward movement of the ram **33**, the follower **39** will be directed into the next spiral cam recess **25** to effectuate turning movement of

the rotatable member, and again to rotate the table **21** to its next position. Thus it can be seen that an effective and efficient rotating table construction has been described. The trays may be moved with the rotatable table **21** into position below a suitable dispensing member, or other device, designed to place materials into said tray. Accurate rotation of the table **21** is effected, and suitable lifting means is provided to raise the trays free of the table during the alignment of said trays with the lifting means. Thus the objects of the invention have been fully achieved, and it can be seen that changes may be made which do not depart from the spirit of the invention as disclosed or the scope thereof as defined in the appended claims.

What is claimed is:

1. A rotary table device comprising a support, vertically spaced plates mounted on said support, a cylindrical member positioned between said plates, means supporting said cylindrical member for rotation about a vertical axis including a shaft connected to said cylindrical member, said shaft being journalled on said plates, said cylindrical member having a plurality of vertically extending parallel slots circumferentially spaced in the outer peripheral surface of said member, a plurality of spirally extending cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said shaft for rotation therewith, said table having a plurality of circumferentially spaced openings, a tray seated in each opening, a fluid-extensible member positioned adjacent said rotatable member below said table, a cam follower support connected to said extensible member, a cam follower resiliently supported on said follower support, a plurality of fingers supported on said cam follower support, said follower being movable within one cam slot upon movement of said extensible member in a first direction to rotate said cylindrical member and said table whereupon one of said openings is in vertical alignment with said fingers, said follower being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said fingers are moved and extend through one of said openings and one of said trays is engaged by said fingers and moved vertically free of said table, said follower being movable in one of said slots below said cam slots during movement of said extensible member in a second direction, and means in said vertical slots directing said cam follower into the next cam slot during the next movement of the extensible member in the first direction.

2. A rotary table device comprising a support, vertically spaced plates mounted on said support, a cylindrical member positioned between said plates, means supporting said cylindrical member for rotation about a vertical axis including a shaft connected to said cylindrical member, said shaft being journalled on said plates, said cylindrical member having a plurality of vertically extending slots circumferentially spaced in the outer peripheral surface of said member, a plurality of spirally extending cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said shaft for rotation therewith, said table having a plurality of circumferentially spaced openings, a tray above each opening, a fluid-extensible member positioned adjacent said rotatable member, a cam follower support connected to said extensible member, and a cam follower supported on said follower support, a support finger supported on said cam follower support, said follower being movable within one cam slot upon movement of said extensible member in a first direction to rotate said cylindrical member and said table whereupon one of said openings is in vertical alignment with said finger, said follower being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said finger is moved to extend through an opening and one of said trays is engaged by said finger and moved vertically free of said table.

3. A rotary table device comprising a support, a cylindrical member positioned on said support for rotation about a vertical axis, said cylindrical member having a plurality of vertically extending parallel slots circumferentially spaced in the outer peripheral surface of said member, a plurality of cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said cylindrical member for rotation therewith, trays on said table, an extensible member, a cam follower connected to said extensible member, and a finger movable by said extensible member, said follower being movable within one cam slot upon movement of said extensible member in a first direction to rotate said cylindrical member and said table whereupon one of said trays is in vertical alignment with said finger, said follower being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said finger is moved and engages one of said trays to move the tray vertically free of said table.

4. A rotary table device comprising a support, a cylindrical member supported for rotation about a vertical axis on said support, said cylindrical member having a plurality of vertically extending slots circumferentially spaced on said member, a plurality of cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said cylindrical member for rotation therewith, said table including a plurality of circumferentially spaced trays, an extensible member positioned adjacent said rotatable member, a cam follower means connected to said extensible member, a support element movable with said cam follower means, said follower means being movable within one cam slot upon movement of said extensible member in a first direction to rotate said cylindrical member and said table whereupon one of said trays is in vertical alignment with said support element, said follower means being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said support element is moved and engages one of said trays for moving the same.

5. A rotary table device comprising a support, a cylindrical member supported on said support for rotation about a vertical axis, said cylindrical member having a plurality of vertically extending parallel slots circumferentially spaced in the outer peripheral surface of said member, a plurality of spirally extending cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said cylindrical member for rotation therewith, said table having a plurality of circumferentially spaced openings, a tray seated in each opening, and a fluid-extensible member positioned adjacent said rotatable member, a cam follower supported on said extensible member, a finger supported on said cam follower, said follower being movable within one cam slot upon movement of said extensible member in a first direction to rotate said cylindrical member and said table whereupon one of said openings is in vertical alignment with said finger, said follower being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said finger is moved to extend through said opening and one of said trays is engaged by said finger and moved vertically free of said table.

6. A rotary table device comprising a support, a drum supported for rotation about a vertical axis on said sup-

port, said drum having a plurality of vertically extending parallel slots circumferentially spaced in the outer peripheral surface of said member, a plurality of spirally extending cam slots in said cylindrical member, each cam slot having one end portion communicating with one of the vertical slots, and another end portion communicating with an adjacent vertical slot, a table connected to said drum for rotation therewith, said table including a plurality of trays, an actuating member positioned adjacent said drum, a cam follower connected to said actuating means, and a supporting element on said cam follower, said follower being movable within one cam slot upon movement of said actuating member in a first direction to rotate said drum and said table whereupon one of said trays is in alignment with said supporting element, said follower being further movable in one of said vertical slots during movement of said extensible member in the first direction whereby said supporting element engages one of said trays for moving the same free of said table.

7. A rotating table device comprising a support, a drum supported on said support for rotation about a vertical axis, said drum having a plurality of circumferentially spaced vertical slots, a spirally shaped cam recess disposed on said drum between said slots, each recess having one end in communication with one slot and its other end in communication with an adjacent slot, a table supported for rotation with said drum, said table having a plurality of circumferentially disposed openings, a tray seated in each opening, a power-actuating means adjacent said drum, a cam follower connected to said actuating means, said cam follower being slidable in said slots and cam recesses, and a supporting element connected for movement with said cam follower, said cam follower being movable in a recess to effect rotation of said drum and table to position one opening in alignment with said supporting element, said cam follower being movable in an upward direction in a slot whereby said supporting element extends through an opening to engage and raise a tray free of said table, said follower being movable in a downward direction to again position said tray in said opening.

8. A rotating table device comprising a support, a drum supported on said support for rotation about a vertical axis, said drum having a plurality of circumferentially spaced vertical slots, a cam recess disposed on said drum between said slots, each recess having one end in communication with one slot and its other end in communication with an adjacent slot, a table supported for rotation with said drum, said table having a plurality of circumferentially disposed openings, a tray seated in each opening, a power-actuating means adjacent said drum, a cam follower connected to said actuating means, said cam follower being slidable in said slots and cam recesses, and a supporting element connected for movement with said cam follower, said cam follower being movable in a recess to effect rotation of said drum and table to position one opening in alignment with said supporting element, said cam follower being movable in an upward direction in a slot whereby said supporting element extends through an opening to engage and raise a tray free of said table, said follower being movable in a downward direction to again position said tray in said opening.

9. A rotating table device comprising a support, a drum supported on said support for rotation about a vertical axis, said drum having a plurality of circumferentially spaced vertical slots, a cam recess disposed on said drum between said slots, each recess having one end in communication with one slot and its other end in communication with an adjacent slot, a table supported for rotation with said drum, said table having a plurality of circumferentially disposed trays, a power-actuating means adjacent said drum, a cam follower connected to said actuating means, said cam follower being slidable in said slots and cam recesses, and a supporting element connected for movement with said cam follower, said cam follower being movable in a recess to effect rotation of said drum and table to position one tray in alignment with said supporting element, said cam follower being movable in an upward direction in a slot whereby said supporting element engages and raises a tray free of said table, said follower being movable in a downward direction to again position said tray in said opening.

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