

[54] **MACHINE FOR EMBODYING STEP BY STEP ROTARY MOTION**

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[51] Int. Cl. **F16h 27/04**

[58] Field of Search 74/84, 122, 118, 116, 112

[56] **References Cited**

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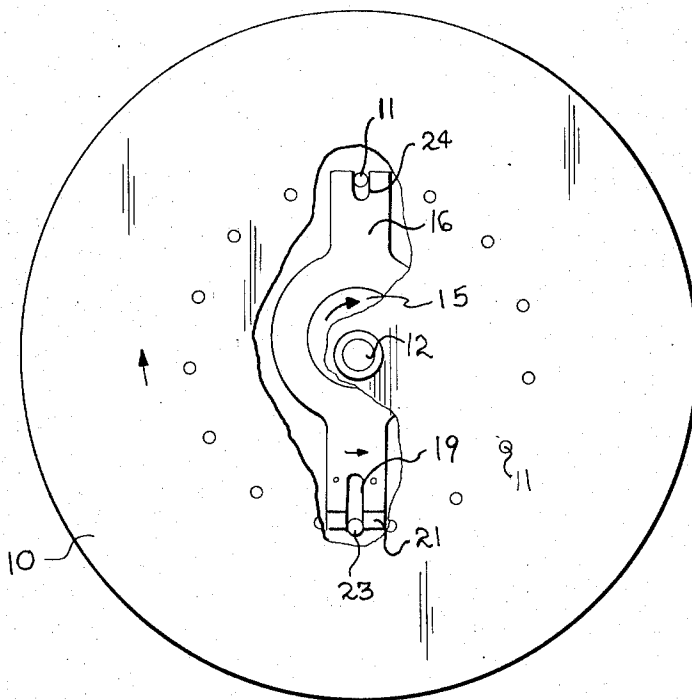
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[57] **ABSTRACT**

Mechanism for imparting step by step or intermittent rotary motion to a table or the like. On the underside of the table is a circular row of rollers of an uneven number. Disposed transversely of the underside of the table is an actuating arm, in the center of which is a driven rotary eccentric cam. Notches in opposite ends of the arm recurrently engage rollers in said row in response to rotation of the eccentric cam. Beneath one of said notches is fixed a block similarly notched and projecting a distance forwardly beyond the end of the actuating arm. Disposed in the notch in the block is a roller rotatable about a fixed axis. Depending upon the direction of rotation of the eccentric cam step by step rotary movement is imparted to the table in one direction or the other.

6 Claims, 4 Drawing Figures



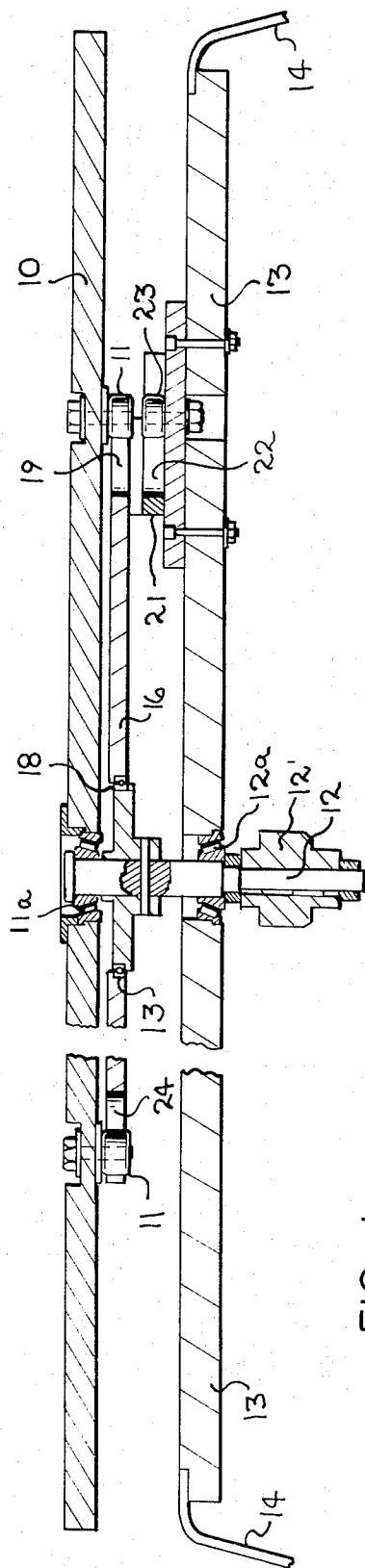


FIG. 1

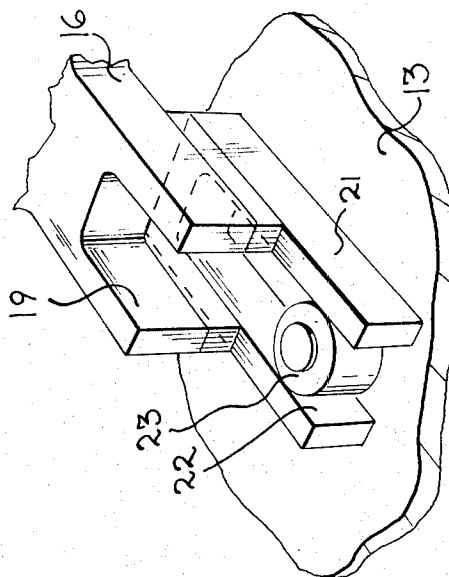


FIG. 2

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FIG 3

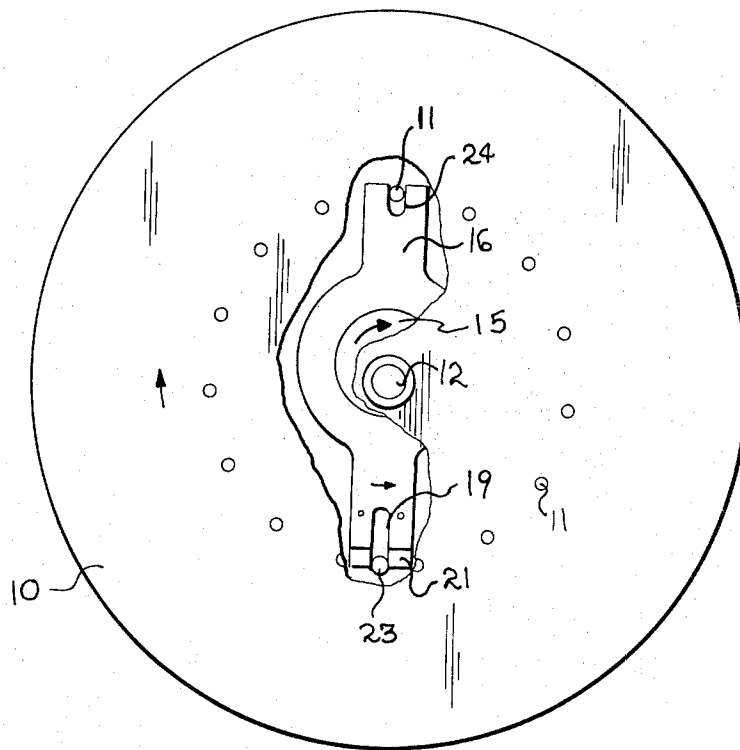
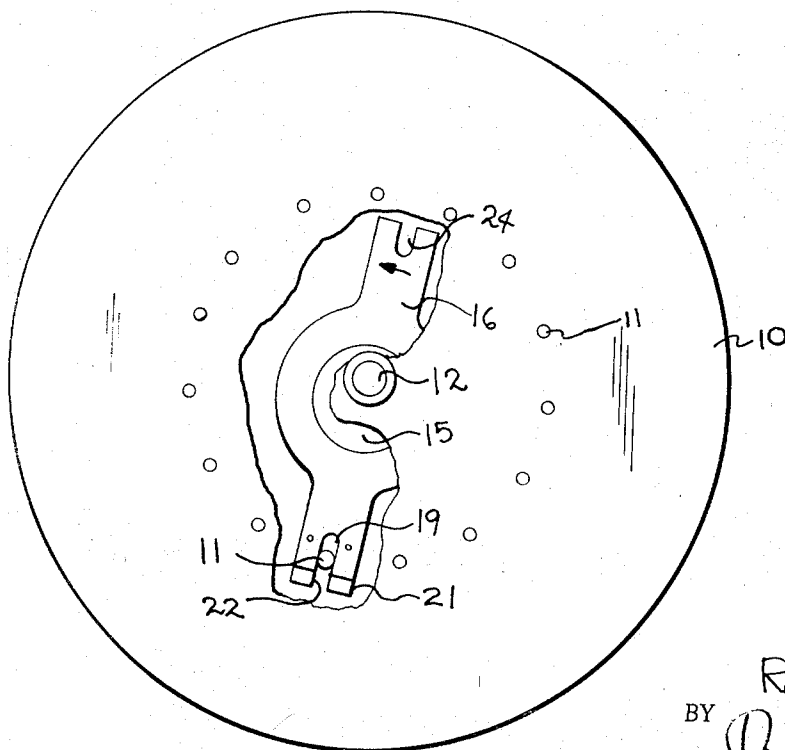


FIG 4



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MACHINE FOR EMBODYING STEP BY STEP ROTARY MOTION

BACKGROUND OF THE INVENTION

For indexing or rotating a member through a fractional part of a revolution, the so-called Geneva wheel or Geneva stop are not infrequently employed. The Geneva stop is used in watches to prevent winding the main spring too tightly, and the principle has been applied to various classes of machinery to obtain intermittent motion. Geneva wheels are frequently used on machine tools for indexing purposes. These devices in the main operate satisfactorily, but they are costly to build and maintain due to the intricate design which requires such precision workmanship.

SUMMARY OF THE INVENTION

The invention produces a novel mechanism for imparting step by step rotary movement to a table or the like which is relatively simple and inexpensive to manufacture and assemble. The parts can be fabricated without difficulty and do not require the precision or workmanship required, for example, with the Geneva wheel. Furthermore, the parts are of such sturdy construction that maintenance is easy and inexpensive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical sectional view substantially through the center of the indexing machine;

FIG. 2 is a top fragmentary perspective view of the end of the actuating arm provided with the notched block for engagement with the stationarily mounted roller;

FIG. 3 is a somewhat schematic top plan view in which one end of the actuating arm is in engagement with a table roller, while the other end is free of a table roller but still engages the stationarily mounted roller; and

FIG. 4 is a view similar to FIG. 3 showing continued movement of the eccentric cam 90° from the position in FIG. 3 and in which the table has been moved, the lower part of the actuating arm engaging a table mounted roller, as well as the stationarily mounted roller, and the upper part having moved clear of its table mounted roller and rocking to the left to engage the next table mounted roller.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The illustrated embodiment of the invention comprises a table 10 which is adapted to be rotated in a step by step or intermittent manner. In this instance, the table 10 is circular in form, and although its usefulness is not illustrated, let it be said that the table could, for example, be equipped with one or more pockets into which articles of predetermined number are recurrently introduced. Between movements, the material is introduced into the pockets and at a certain point of its rotation the pockets are opened and the contents discharged into containers, such as plastic bags, which, through suitable means, are continuously positioned for packaging. This brief description is only for the purpose of suggesting one use for a table to which step by step rotary movement is imparted.

On the underside of the table, and spaced inwardly from the periphery thereof, is a circular row of rollers 11 mounted for rotation about a vertical axes. The number of the rollers may be varied, but in any event, the number must be uneven. For example, in the illustrated embodiment, 15 rollers are indicated. The table 10 is adapted to rotate on antifriction thrust bearings 11a about a vertical shaft 12. The shaft is continuously rotated by any suitable means (not shown), such as an electric motor operating through reduction gearing to a driven gear 12' which is keyed to the lower end of the shaft 12.

Arranged beneath the table 10 and in spaced parallel relationship thereto is a flat table-like platen 13, which is held stationary by any suitable means, such, for example, as legs 14, which depend from the outer edge portions of the platen and may be suitably fixed to a stationary support. The operating shaft 12 passes through a hole in the center of the platen 13 and an antifriction thrust bearing 12a is interposed between these parts.

Fixed in any suitable manner to the shaft 12 and disposed between the table 10 and platen 13 is an eccentric cam 15 which operates in a central hole 17 in an actuating arm 16 which extends generally across the table for engagement with the respective rollers 11, as will hereinafter appear. Ball bearings 18 are interposed between the periphery of the cam 15 and the edge of the hole 17.

In one end of the arm 16 is a U-shaped notch 19 shaped to accommodate a roller 11 during the operation of the machine. Fixed to the underside of the actuating arm 16, and in the region of the notch 19, and projecting somewhat beyond the end of the arm 16 is a block 21. The block 21 has a U-shaped notch 22 with which the notch 19 aligns. The inner end of the notch 22 is in registry with the inner end of the notch 19, but the open outer end projects substantially beyond the adjacent end of the notch 19. The notch 22 is of the same lateral dimension as the notch 19.

On the platen 13 is a roller 23 similar to the rollers 11 and which operates in the notch 22 in the block 21. The roller 23 is so disposed on the platen 13 that its axis can be aligned with successive rollers 11 when disposed in position, one above the other. The opposite end of the actuating arm 16 is also provided with a U-shaped notch 24 similar in size and shape to the notch 19 and this also engages successive rollers 11 in the operation of the machine.

In operation of the machine, it will be understood that the eccentric cam 15, in response to rotation of the shaft 12, shifts the actuating arm back and forth and, depending upon the direction of the rotation of the shaft, the table is indexed step by step in one direction or the other. Assuming that the actuating arm 16 has been shifted so that the notch 24 is in engagement with one of the rollers 11 and the cam 15 rotates in a clockwise direction, the opposite end of the actuating arm 16 is shifted so that the notch 19 is moved into engagement with an adjacent roller 11 (See FIGS. 3 and 4). Such shifting arm movement causes the notch 24 to move away from the respective roller 11. Further rotation of the cam 15 rocks the portion of the arm 16 having the notch 24 to the left of the FIG. 4 to move into engagement with the next roller 11 on the left. Such

arm shifting movement causes the notch 19 to clear its respective roller 11. Further rotation of the cam causes clockwise movement of the arm 16 about the pivot roller 23 and due to rocking of the other end of the arm 16 which through the notch 24 engages a roller 11, the table 10 is rotated in clockwise direction. The notch 19 is then positioned to engage the next succeeding roller 11 due to turning of the table 10. The eccentric cam 15 then shifts the arm 16 longitudinally to cause the notch 19 to engage a roller 11 and the notch 24 to discharge its roller 11. Then the cam shifts the end of the arm 16 to the left to engage the next adjacent roller 11 by the notch 24. The operation then repeats itself as the eccentric cam 15 rotates, imparting intermittent or step by step movement to the table 10.

What I claim is:

1. A machine for imparting step by step rotary motion comprising
 - a table mounted for rotary movement,
 - a circular row coaxial with the table axis of an uneven number of rollers projecting from said table,
 - an actuating arm arranged transversely of said table having roller-engaging notches at opposite ends thereof,
 - a driven rotary eccentric cam operating in a central hole in said actuating arm,
 - a block secured to one side of said actuating arm at an end portion thereof and projecting beyond the end of said arm,
 - said block having a roller engaging notch registering

with the adjacent notch of said arm and extending to the outer end of said block, and
a roller mounted on a fixed axis relatively shiftable in said notch of said block and at all times disposed therein,

whereby responsive to the eccentric cam movement, the actuating arm is shifted so as to successively engage table mounted rollers and also rocked about the stationarily mounted roller to effect intermittent table movement.

2. A machine as claimed in claim 1, comprising a shaft about which said table rotates, a fixed connection between said shaft and eccentric cam, and means for rotating said shaft.

3. A machine as claimed in claim 2, comprising a stationary platen generally parallel to said table and through which said shaft extends, antifriction thrust bearings in said table and platen for said shaft, and means for mounting said fixed axis mounted roller on said platen.

4. A machine as claimed in claim 3, in which said eccentric cam and actuating arm are disposed between said table and platen, and said circular row of rollers are mounted on the underside of said table.

5. A machine as claimed in claim 2, comprising leg means for said platen to hold same stationary.

6. A machine as claimed in claim 1, comprising antifriction bearings interposed between said eccentric cam and said actuating arm.

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