

July 15, 1958

E. R. ROLL

2,843,111

DEVICE FOR INDUCING SLEEP

Filed Aug. 30, 1956

3 Sheets-Sheet 1

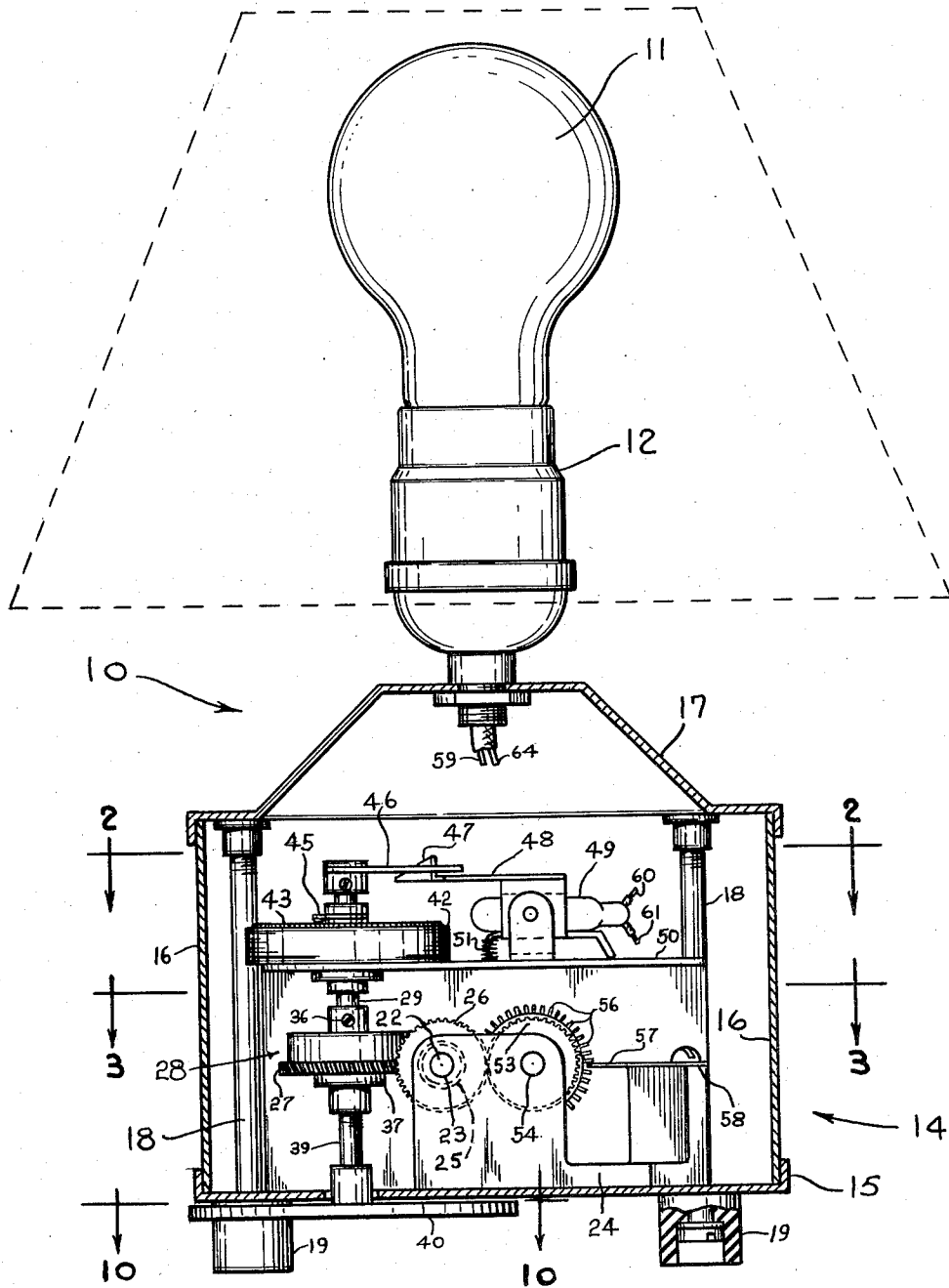


FIG. 1

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FIG. 2

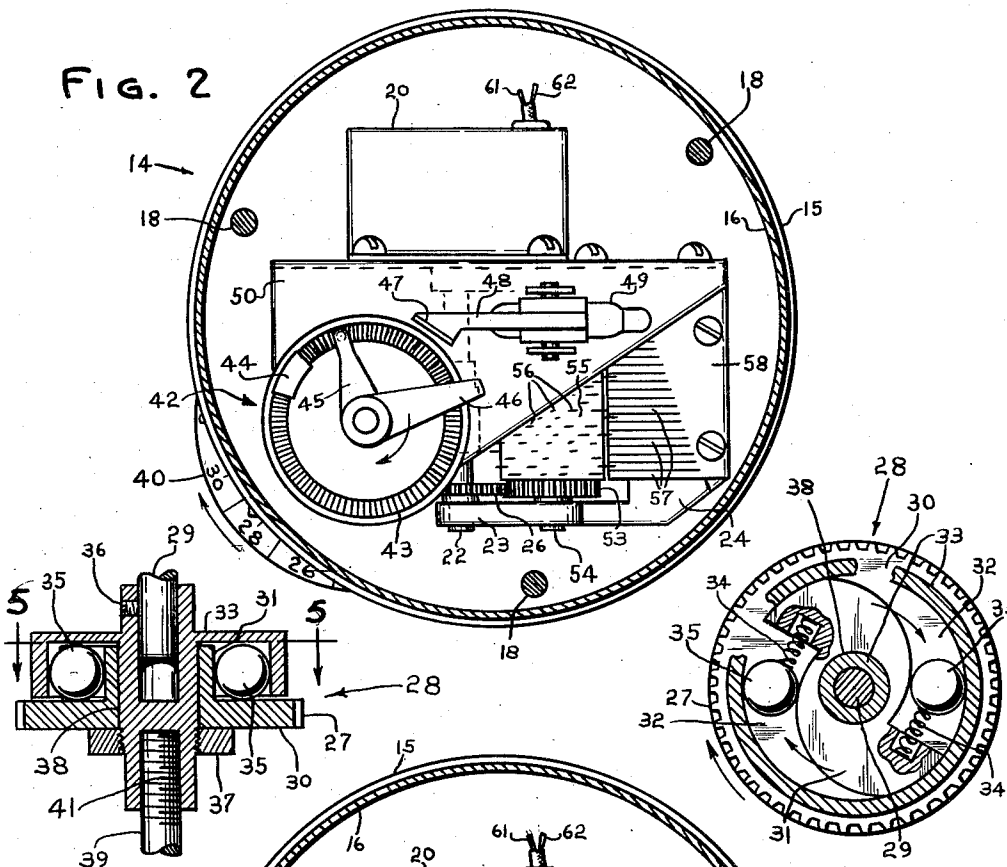


FIG. 4

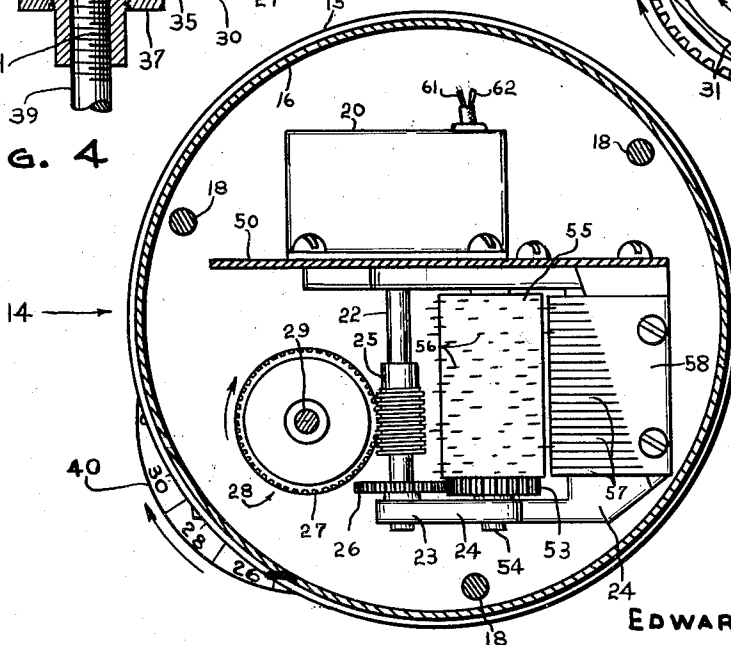


FIG. 3

FIG. 5

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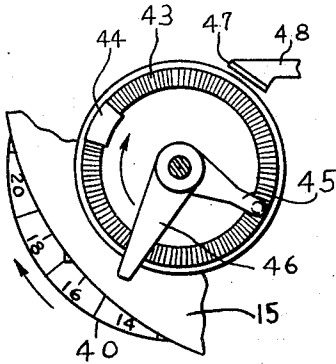


FIG. 6

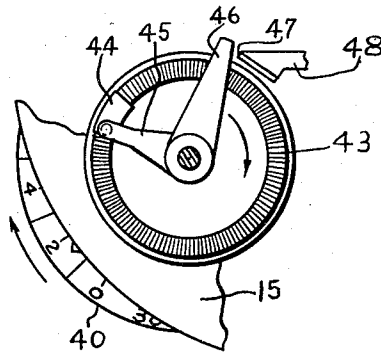


FIG. 7

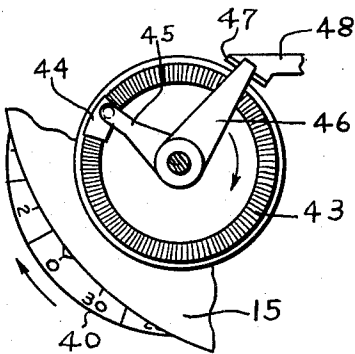


FIG. 8

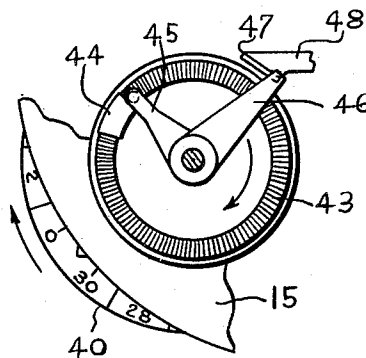


FIG. 9

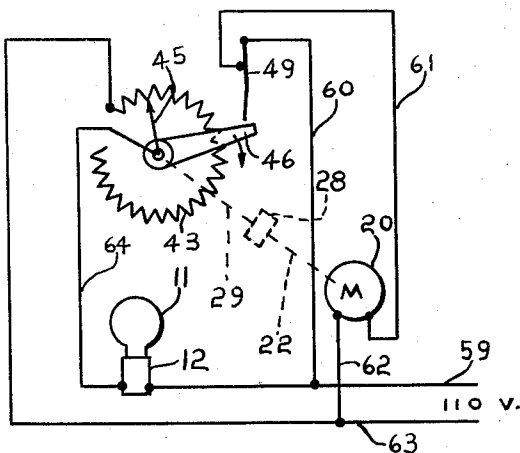


FIG. 11

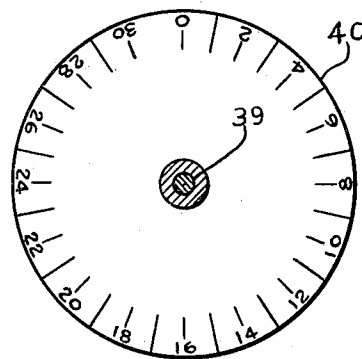


FIG. 10

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DEVICE FOR INDUCING SLEEP

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Application August 30, 1956, Serial No. 607,208

5 Claims. (Cl. 128—1)

This invention relates to a means for inducing sleep. More particularly it relates to the inducing of sleep by means of a gradual reduction of illumination in a sleeping room in simulation of natural twilight accompanied by restful music.

This invention operates upon the principles that a pleasing and harmonious sound will induce relaxation and sleep and that nature's method of inducing relaxation and sleep is a gradual reduction of light as produced by the setting of the sun. Sudden darkness before going to bed is a stimulant and not a sedative. In the case of small children, it is often terrorizing.

It is an object of this invention to provide a device for inducing sleep which incorporates both the principles of a pleasing and harmonious sound and the gradual diminishing of illumination to produce sleep and relaxation.

Another object of this invention is to provide a device which will dim a light and produce music for a predetermined time and automatically shut off the music and extinguish the light at the end of said predetermined period.

Another object of this invention is to provide a device for dimming a light and producing music with a single control which will vary the operating time and permit adjustment while the device is running.

Another object of this invention is to provide a device for inducing sleep which can also be used as an ordinary bed lamp by a simple manipulation of the control.

Another object of this invention is to provide a device for inducing sleep which is of simple and durable construction.

These objects are attained by a single device, the component parts of which are mounted in a housing which forms the base of an ordinary table lamp. The socket and bulb are mounted at the top of the housing. A constant speed electric motor mounted in the housing drives the shaft of a rheostat and operates a music box. The rheostat can be adjusted by means of a calibrated control disk mounted at the bottom end of the rheostat shaft to give a period of operation anywhere from two to thirty minutes. During the pre-selected period of operation the music box will play continuously and the bulb will gradually dim due to the increase of electrical resistance in the bulb circuit as the rheostat arm mounted on the upper end of the rheostat shaft rotates to incorporate an increasingly greater amount of the rheostat resistance into the light circuit. The end of the pre-selected period is reached when the rheostat arm contacts the insulated portion (constituting the bulb switch) of the resistance winding thereby opening the bulb circuit and extinguishing the bulb. The motor and music box continue to run for a short period of time until the motor switch arm mounted on the upper end of the rheostat shaft engages the actuating arm of the mercury-type motor switch to shut off the motor. Further manual rotation of the rheostat shaft by means of the control disk will close the bulb circuit. In this position, the motor switch arm continues to engage the motor switch to hold said switch in

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the open position and the bulb burns brightly because the minimum rheostat resistance is in the circuit. The device now serves as an ordinary table lamp. Further manual rotation of the rheostat shaft will disengage the motor switch arm and the actuating arm of the motor switch thus energizing the motor circuit. The music box plays and the bulb dims. The rheostat shaft can be manually advanced to shorten the period of operation while the motor is running with no ill effects to the mechanism through the use of a one-way clutch arrangement between the motor shaft and the rheostat shaft.

From the foregoing it is apparent that this invention provides a very effective combination of the sleep inducing principles of harmonious sound and diminishing illumination into a simple, flexible and easily controlled device.

Other object and advantages will be pointed out in, or be apparent from, the specification and claims, as will obvious modifications of the embodiment shown in the drawings, in which:

Fig. 1 is a side elevation view of a lamp embodying the invention with the housing for the base cut away;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view in side elevation of the one-way clutch mechanism between the motor shaft and the rheostat shaft;

Fig. 5 is an enlarged sectional view taken along line 5—5 of Fig. 4;

Fig. 6 is a plan view of the rheostat mechanism showing the relative position of the component parts when the music box is playing and the light is being dimmed;

Fig. 7 is a plan view of the rheostat mechanism showing the relative position of the component parts when the light is extinguished and the music box is playing;

Fig. 8 is a plan view of the rheostat mechanism showing the relative position of the component parts when the light is extinguished and the music box is stopped;

Fig. 9 is a plan view of the rheostat mechanism showing the relative position of the component parts when the light is burning with maximum intensity and the music is stopped;

Fig. 10 is a sectional view taken along line 10—10 of Fig. 1; and

Fig. 11 is a schematic wiring diagram showing the electrical connections of the component parts.

Referring to the drawings, the sleep inducing device 10 consists of an electric light bulb 11 in socket 12 connected by conductors 59 and 64 into the electric circuit shown in Fig. 11 in a manner hereinafter described. The mechanism which constitutes the subject matter of this invention is mounted in housing 14 which consists of base plate 15, vertical walls 16 and cover 17 on which socket 12 is mounted. The housing is held together by bolts 18 and supported by feet 19.

The mechanism mounted in housing 14 includes constant speed electric motor 20 connected by wires 61 and 62 into the electric circuit shown in Fig. 11 in a manner to be described later. Motor 20 drives motor shaft 22 which is journaled as at 23 in bracket 24. Worm gear 25 and spur gear 26 are fixedly mounted on the motor shaft intermediate its ends. Worm gear 25 is in driving engagement with worm wheel 27 on one-way clutch mechanism 28 mounted on rheostat shaft 29. The one-way clutch will drive rheostat shaft 29 only when worm wheel 27 is rotated in a clockwise direction when viewed from above (see Fig. 5). The advantages obtained thereby are stated in the detailed discussion of the operation of the device that follows. Referring to Figs. 4 and 5, rotation of worm wheel 27 will rotate member 30 and up-

standing section 31 thereon which, along with member 33, defines cavities 32, 32. The relative movement of section 31 and member 33 and the pressure exerted by compression springs 34, 34 will, when section 31 is rotated in a clockwise direction, act to force balls 35, 35 toward the reduced area of cavities 32, 32, increasing the friction between the balls and section 31 and member 33 and thereby impart the rotational movement of worm wheel 27 to member 33. Member 33 is fixedly mounted on rheostat shaft 29 by means of set screw 36. Member 30 is held in place by nut 37 threadedly connected to member 33. There is a loose fit 38 between members 30 and 33 to permit free relative movement of the parts. Control shaft 39 with control disk 40 fixedly mounted at one end is threadedly connected to member 33 by left-hand threads 41. When control disk 40 is rotated clockwise as viewed from above, control shaft 39, member 33 and rheostat shaft 29 will rotate freely and independently of member 30 since the relative movement of upstanding section 31 of member 30 and member 33 will tend to force balls 35, 35 toward the enlarged area of cavities 32, 32.

Rheostat shaft 29 passes through an opening in the center of rheostat 42 which carries resistance winding 43 with insulated segment 44. Rheostat arm 45 is fixedly mounted on the rheostat shaft and adapted to rotate with its end in electrical contact with the resistance winding. Motor switch arm 46 is fixedly mounted on the end of the rheostat shaft and adapted when rotated to engage the cam surface 47 on actuating arm 48 and thereby open and close the contacts of mercury-type motor switch 49 which is tiltably mounted in bracket 50, biased by compression spring 51 to hold the switch in a normally closed position, and connected by conductors 60 and 61 into the electric circuit shown in Fig. 11 in a manner hereinafter described.

Spur gear 53 fixedly mounted on music box shaft 54 is driven by spur gear 26 on motor shaft 22. Music box cylinder 55 with properly spaced tines 56 is fixedly mounted on the music box shaft and adapted when rotated for engagement of the tines and the segments 57 of sounding member 58 to thereby effect a systematic plucking of the segments to produce music of a type conducive to sleep and relaxation.

The device operates as follows:

Referring to Fig. 11, when switch 49 is closed current will flow through conductors 59, 60, switch 49, conductor 61, motor 20 and conductors 62, 63. When rheostat arm 45 is in contact with variable resistance winding 43, current will flow through conductor 59, bulb 11, conductor 64, arm 45, winding 43 and conductor 63. Motor 20 drives motor shaft 22 and worm gear 25 and spur gear 26 mounted thereon. Worm gear 25 drives worm wheel 27 which in turn drives rheostat shaft 29, rheostat arm 45 and motor switch arm 46 through one-way clutch mechanism 28. Spur gear 26 drives spur gear 53 and music box cylinder 55 to produce music. As the rheostat travels over resistance winding 43 an increasingly greater length of the winding is incorporated into the bulb circuit thus gradually increasing the electrical resistance of the circuit and decreasing the intensity of the light produced by bulb 11. The relative positions of rheostat arm 45 and motor switch arm 46 on the rheostat shaft are such that the following sequence of light and music occurs as rheostat shaft 29 rotates. Referring to Figs. 6-9, Fig. 6 shows a position where motor switch arm 46 is disengaged from the cam surface 47 of actuating arm 48 with motor switch 49 in the normally closed position causing the motor to run. The motor drives rheostat arm 46 which is in contact with the resistance winding causing the bulb to dim and also drives the music box to produce music. In Fig. 7 the continued rotation of the rheostat arm has carried it into contact with the insulated segment 44 of the resistance winding opening the bulb circuit and thereby extinguishing the bulb. The rheostat arm, resistance winding, and insulated segment thereof constitute the bulb switch. The motor switch arm has

not yet engaged the actuating arm of the motor switch so the motor continues to drive the rheostat shaft and the music box. In Fig. 8 the rheostat arm is still in contact with insulated segment 44 and the bulb is extinguished. The motor switch arm has now engaged the actuating arm opening the motor switch and stopping the motor. The music is stopped, the bulb is out and the rheostat shaft is stationary. A slight manual rotation of the rheostat shaft to the position shown in Fig. 9 will bring the rheostat arm in contact with the resistance winding and cause the bulb to burn with maximum intensity. The motor switch arm remains in engagement with the actuating arm of the motor switch keeping the motor switch open. In this position the device serves as an ordinary table lamp. A further manual rotation of the rheostat shaft to a position similar to that shown in Fig. 6 will close the motor switch and start the motor. The music box will play and the rheostat arm will rotate to gradually dim the bulb.

Manual rotation of the rheostat shaft is accomplished by means of control shaft 39 and control disk 40. The provision of a left-handed threaded connection 41 between the control shaft and member 33 of one-way clutch mechanism 28 allows the rheostat shaft to be rotated in a clockwise direction only (when viewed from above) since rotation in the other direction will only unscrew control shaft 39 from member 33. This arrangement prevents possible damage to the gears and associated parts in the event the control disk is rotated in a counter-clockwise direction. The one-way clutch mechanism 28 previously described allows the rheostat shaft to be advanced manually in a clockwise direction by means of control disk 40 free and independent of member 30, worm gear 25 and worm wheel 27 even while the motor is running. Thus, the manual actuation required to advance the rheostat arm from the position shown in Fig. 8 to that shown in Fig. 9 and from that shown in Fig. 9 to that shown in Fig. 6 is readily accomplished. It is also possible to rotate the rheostat arm while the motor is running to adjust the time that will elapse before the bulb is extinguished and the music is stopped. The control disk 40 is calibrated as shown in Fig. 10 to provide pre-selection of a desired operating time from a range of zero to thirty minutes and is mounted so that the circumference thereof extends a short distance beyond the periphery of base plate 15 to expose the calibrations thereon and provide access for easy manipulation thereof. This range can be varied, of course, by changing the size of certain parts and/or the speed of the motor.

Although but a single embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A sleep inducing device comprising: a housing; a socket with a bulb supported by said housing; an electric motor in the housing; a rheostat in the housing driven by the motor through a rheostat shaft and a one-way clutch mechanism to dim the bulb; a music box in the housing driven by the motor; a motor switch actuated by the motor to open and close said switch; and a calibrated control disk mounted on the rheostat shaft to adjust the period of time during which the bulb will dim and the music box will play.

2. A sleep inducing device according to claim 1 in which the one-way clutch mechanism is driven by a motor shaft, a worm gear mounted on said shaft, and a worm wheel mounted on the one-way clutch mechanism.

3. A sleep inducing device according to claim 2 in which the music box includes a sounding member actuated by a music box cylinder mounted on a music box shaft and driven by a spur gear mounted on the motor

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shaft and a spur gear mounted on the music box shaft in driving engagement with each other.

4. A sleep inducing device according to claim 3 in which the circumference of the control disk mounted on the rheostat shaft extends outside the periphery of the housing to expose the calibrations on said disk and provide access for easy manipulation thereof.

5. A sleep inducing device of the type comprising a housing containing means driven by a motor to gradually decrease the intensity of the light produced by a bulb and means driven by said motor to produce music; in which there is control means to adjust the period of time during which the light will dim and the music will play including a control disk mounted on a shaft driven by

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said motor through a one-way clutch connection to permit adjustment of said period of operation while the motor is running, said disk having a portion extending beyond said housing.

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