United States Patent [19]

Draghi

[11] **3,879,587**

[45] **Apr. 22, 1975**

[54] **BLENDER APPARATUS HAVING MANUAL PRESET TIMER ACTUATING DEVICE**

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[73] Assignee: **M. H. Rhodes, Inc.**, Avon, Conn.

[22] Filed: **June 13, 1973**

[21] Appl. No.: **369,450**

[52] **U.S. Cl.** ..... **200/35 R**; 200/38 A

[51] **Int. Cl.** **H01h 43/14**

[58] **Field of Search** ..... 200/33, 35, 38 R, 38 A, 200/38 F-38 FB, 38 B, 38 BA, 38 C, 38 CA, 39 R, 39 A, 5 EB; 116/67

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Primary Examiner—James R. Scott

Attorney, Agent, or Firm—Prutzman, Hayes, Kalb & Chilton

[57] **ABSTRACT**

A blender base having a multiple push button switch and a knob set timer actuating device for presetting the time interval of operation of the blender and for actuating a switch slide to deenergize the blender at the end of the preset interval. The timer actuating device may also be knob set in an inactive mode for permitting indeterminate operation of the blender and in a hold mode for automatically returning a depressed switch push button when it is manually released.

10 Claims, 4 Drawing Figures

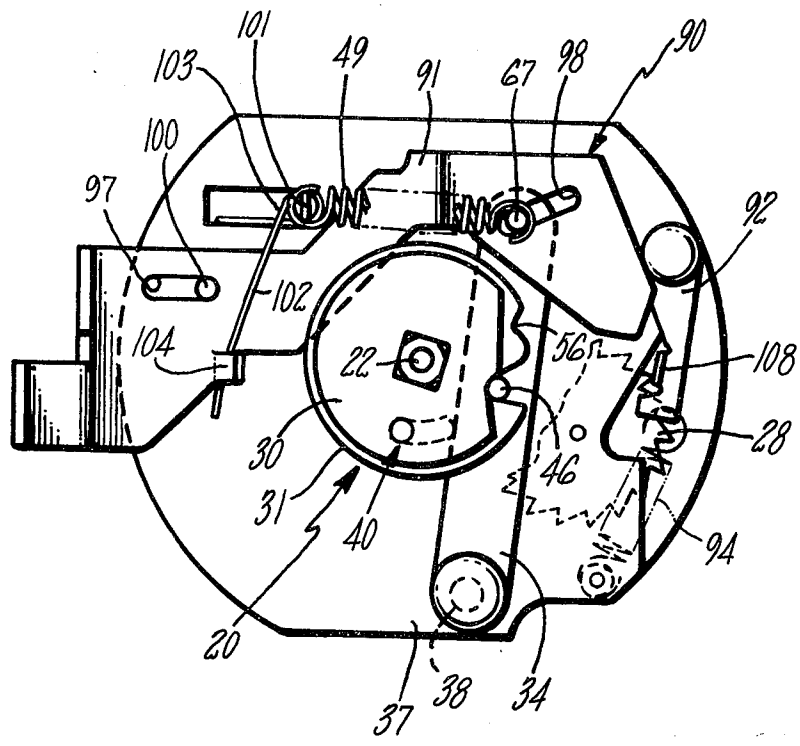


FIG. 1

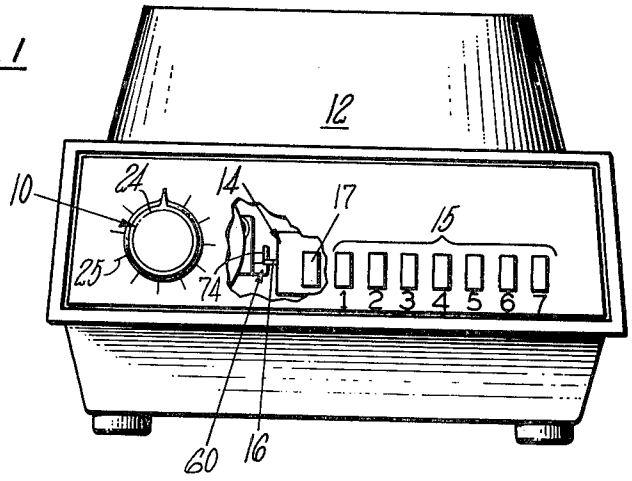

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FIG. 2

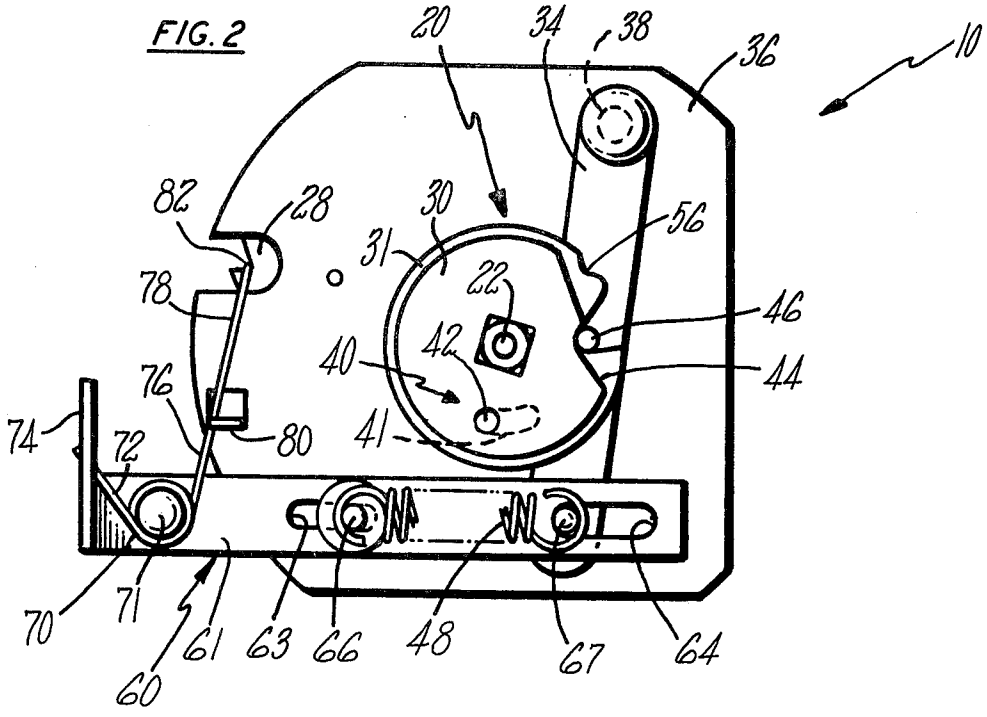

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FIG. 3

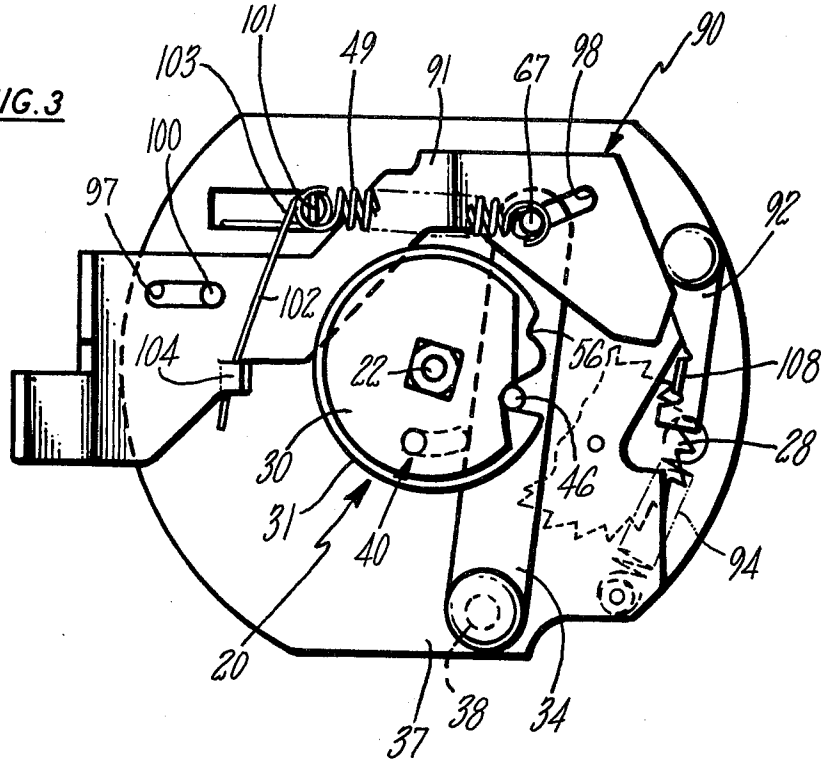
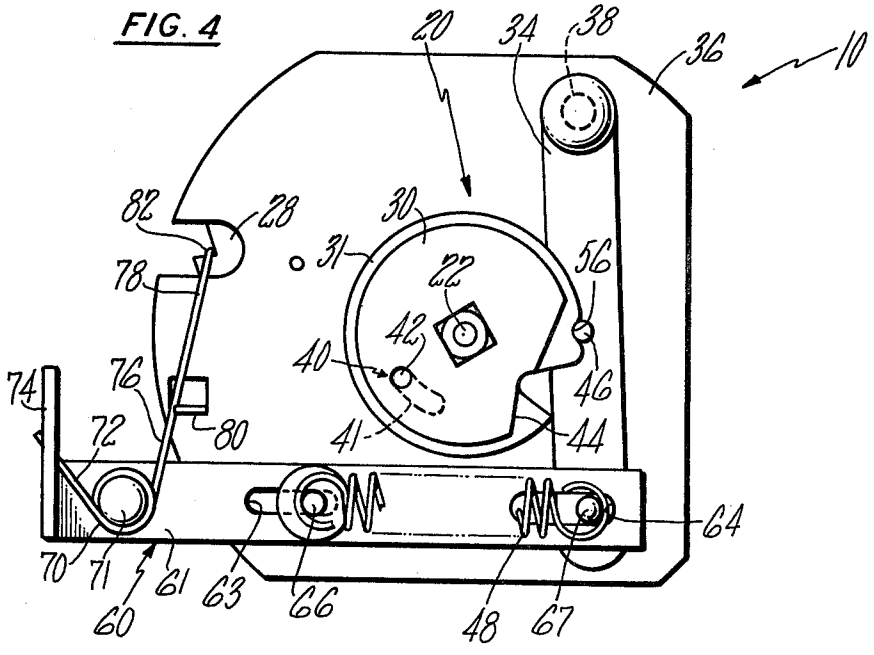

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FIG. 4


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BLENDER APPARATUS HAVING MANUAL PRESET TIMER ACTUATING DEVICE

BRIEF SUMMARY OF THE INVENTION

The present invention relates generally to timer actuating devices of the type adapted to actuate an associated mechanism such as an electric switch upon the expiration of a predetermined time interval.

It is a principal aim of the present invention to provide a new and improved timer actuating device useful with an independently operable two position device such as an electric switch to return the two position device to a first position thereof after a predetermined time interval after it has been actuated to its other position. For example, in accordance with the present invention the timer actuating device is useful for turning off a switch after a predetermined time interval after it was turned on.

It is another aim of the present invention to provide a new and improved time actuating device of the type described which also has a zero time or "hold" operating mode which permits the associated two position device to be manually operated and held in one position thereof and which automatically returns the device to its other position when released.

It is a further aim of the present invention to provide a new and improved timer actuating device for a blender switch for turning off the blender after a preselected time interval of operation.

It is another aim of the present invention to provide a new and improved timer actuating device for a blender switch for manually presetting the time interval of operation of the blender and which is interlocked such that the time interval begins when the blender switch is switched on. In accordance with the present invention, the timer actuating device also has a zero time mode of operation wherein the timer actuating device provides for automatically returning a manually depressed push button of a multiple push button blender switch to an off position when released such that "flash" or momentary blender operation may be obtained by momentarily depressing the desired push button.

It is a further aim of the present invention to provide a new and improved timer actuating device having a knob which may be angularly preset to preestablish the desired time interval and wherein the preset time interval does not commence until an associated device is operated in a predetermined manner.

It is another aim of the present invention to provide a new and improved timer actuating device useful for actuating an associated device to terminate an operational cycle of the device after a predetermined time interval and having additional modes of operation permitting indeterminate length and "hold" operational cycles of te associated device.

It is another aim of the present invention to provide a new and improved timer actuating device having a compact and economical construction and providing reliable service over a long useful life.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

A better understanding of the invention will be obtained from the following detailed description and the accompanying drawing of illustrative applications of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the Drawing:

FIG. **1** is a front elevation view, partly broken away, of a blender base incorporating a timer actuating device of the present invention;

FIGS. **2** and **4** are enlarged rear elevation views of one embodiment of the timer actuating device of FIG. **1**; and

FIG. **3** is an enlarged rear elevation view of another embodiment of the timer actuating device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing in detail wherein like numerals are used to represent like parts, a timer actuating device **10** is shown employed in a blender base assembly **12** of otherwise generally conventional construction and having a switch **14** with a plurality of aligned "speed" push buttons **15** for operating the blender electric motor (not shown) at different speeds and an "off" push button **17** for turning the blender motor off. In a known manner, the switch **14** comprises a cam interlock slide **16** which is cam actuated to the left as viewed in FIG. **1** by depressing any one of the "speed" push buttons **15** and is cam actuated to the right as viewed in FIG. **1** to retract the depressed push button (and thereby deenergize the blender motor) by depressing the "off" push button **17.** Also, the cam interlock slide **16** is contoured such that only one "speed" push button **15** may be depressed at any one time and such that when any push button **15** or **17** is depressed any other previously depressed button is thereupon retracted.

The timer actuating device **10** comprises a timer **20** of the type shown and described in U.S. Pat. No. 2,961,989 of Lawrence J. Laviana, dated Nov. 29,1960 and entitled "Timer Switch" and is therefore not shown and described in detail herein. Briefly, however, the timer **20** has a main shaft **22** to which a timer control knob **24** is affixed. The timer knob **24** and main shaft **22** are shown in the drawing in their "0ff" or zero time position, and the timer knob **24** is adapted to be rotated clockwise as viewed in FIG. **1** to rotate the shaft **22** counterclockwise as viewed in FIGS. **2** and **3** to set the desired time interval. A suitably calibrated scale **25** may be provided on the face of the blender base to show the preset and remaining time interval in seconds of operation. A timer mechanism having a main spring operated clock motor with an escapement wheel **28** provides for rotating the main shaft **22** and knob **24** in the reverse angular direction. As will be explained more fully hereinafter, the escapement wheel **28** is adapted to be selectively locked against rotation in the counterclockwise direction as viewed in FIGS. **2** and **3** to selectively lock the timer mechanism against operation.

A pair of coaxial control cam discs **30, 31** are mounted on the rear end of the shaft **22** for operating a control lever **34** pivotally mounted on the clock motor frame **36** (FIG. **2**) or **37** (FIG. **3**) by a pivot pin **38.** Although the control levers **34** in the embodiments shown in FIGS. **2** and **3** are mounted on the respective clock motor frames **36, 37** somewhat differently, the operation of each control lever **34** by the cam discs **30,** 31 is the same in each embodiment and substantially as described in the aforementioned U.S. Pat. No.

2,961,989. The outer slightly smaller diameter cam disc **30** is fixed to the main shaft **22** and the inner slightly larger diameter cam disc **31** is rotatable on the shaft **22** and is connected to the cam disc **30** by a lost motion coupling **40** comprising an angularly extending slot **41** in the inner cam **31** and an axially inwardly projecting boss or pin **42** integrally formed on the outer cam disc **30.** When the knob **24** is rotated from its zero position in the clockwise direction as viewed in FIG. **1** to preset the time interval, a cam shoulder **44** of the outer cam disc **30** engages a follower pin **46** on the control lever **34** to pivot the lever **34** outwardly against the bias of a return or power spring **48** (FIG. **2**) or **49** (FIG. **3**). The inner cam disc **31** is picked up by the outer cam disc **30** via the lost motion coupling **40** as the follower pin **46** reaches the outer edge of the disc **30.** The discs **30, 31** thereafter rotate together as the knob **24** is rotated to set the time interval with the follower pin **46** riding on the slightly larger inner disc **31.** As the main shaft **22** is rotated in the opposite direction in the clockwise direction as viewed in FIGS. **2** and **3** by the clock motor, the inner disc **31** remains stationary until the lost motion of the coupling **40** is taken up whereupon the discs **30, 31** rotate together (in their angular relationship shown in FIGS. **2** and **3**) until the follower pin **46** is suddenly released from the outer edge of the cam **31** into the cooperating pockets formed in the cam discs. The clock motor is thereupon locked by the follower pin **46** against further rotation. However, the main shaft **22** may be manually rotated by the knob **24** further in the clockwise direction as viewed in FIGS. **2** and **3** to position the follower pin **46** in a peripheral pocket **56** in the inner disc **31** to position the control lever **34** in an intermediate outer position as shown in FIG. **4.**

In accordance with the present invention, a control mechanism **60** (FIG. **2**) or **90** (FIG. **3**) is mounted on the respective timer frame **36** or **37** for timely releasing the escapement wheel **28** and for connecting the timer actuating device **10** for actuating an associated device in the shown embodiment for connecting the timer actuating device for actuating the interlock slide **16** of the push button switch **14.**

Referring now specifically to the embodiment of FIG. **2,** the control mechanism **60** comprises a reciprocable actuator slide **61** having a pair of generally aligned elongated slots **63, 64** which respectively receive a first fixed pin **66** and a second control pin **67** of the lever **34** and which collectively provide for mounting the slide **61** for substantially rectilinear reciprocable movement. The power spring **48** is connected between the pins **66,** 67 to bias the control lever **34** inwardly against the cams **30, 31** and to act through the control pin **67** to bias the slide **61** to the left as viewed in FIG. **2.** Thus, the power spring **48** holds the slide **61** in its retracted position shown in FIG. **2** while the control lever **34** is in its retracted position also shown in FIG. **2.** Additionally, the elongated slot **64** permits the control lever **34** to be pivoted outwardly to its extended position by manual rotation of the knob **24** without withdrawing the slide **61** to the right as seen in FIG. **2.** The slot **64** and control pin **67** thereby provide a lost motion connection between the control lever **34** (and the power spring **48**) and the slide **61.**

A second coil spring **70** is mounted on an upstanding pin **71** of the slide **61.** One end **72** of the coil spring **70** engages the edge of a bumper **74** of the actuator slide **61** and the other end **76** of the coil spring **70** forms a leaf spring **78** which engages an upstanding tang **80** of the timer frame **36** to provide a relatively light bias for retaining the slide **61** in its retracted position shown in FIG. **2** when the control lever **34** is retracted. An outer inturned end portion **82** of the leaf spring **78** engages the periphery of the escapement wheel **28** to restrain the escapement wheel **28** against rotation in the counterclockwise direction as viewed in FIG. **2** while the slide **61** is in its retracted position shown in FIG. **2.** The slide **61** is mounted so that it is adapted to be shifted to the right as seen in FIG. **2** by the cam interlock slide **16** when one of the speed push buttons **15** is depressed, whereupon the inturned end portion **82** of the leaf spring **78** is pivoted outwardly by the tang **80** and thereby withdrawn from the escapement wheel **28** to release the escapement wheel for operation of the timer motor.

In operation, the timer actuating device **10** is mounted such that the end bumper **74** of the actuator slide **61** engages the end of the cam interlock slide **16** of the switch **14.** Rotation of the timer control knob **24** in the clockwise direction as viewed in FIG. **1** to set the desired time interval pivots the control lever **34** outwardly, but the timer motor remains locked against operation by the engagement of the inturned end portion **82** of the leaf spring **78** with the escapement wheel **28.** Subsequently, the desired "speed" push button **15** is depressed to energize the blender motor and the actuator slide **61** is thereupon shifted by the cam interlock slide **16** to the right as viewed in FIG. **2** to release the escapement wheel **28** and thereby initiate the preset time interval. Thus, even if the timer knob **24** is preset substantially in advance of depressing a blender push button **15,** the time interval nonetheless commences when the push button is depressed to accurately time the blender operation. Also, if the "off" push button **17** is depressed before the time interval is completed, the slide **61** will thereupon be released to return to its retracted position to relock the timer motor. In either event, upon completion of the preset time interval of operation of the blender, the control lever **34** is suddenly released to be returned to its retracted position by the relatively strong power spring **48.**

With the control lever **34** in its fully extended position and with the actuator slide **61** in its fully extended position in engagement with the fixed pin **66,** there is still some lost motion between the control lever pin **67** and the slide **61** such that the lever pin **67** under the force of the power spring **48** suddenly impacts the actuator slide **61** with considerable force when the control lever **34** is released. The control lever **34** thereby quickly returns the actuator slide **61** to its normal retracted position to shift the cam interlock slide **16** to the right as viewed in FIG. **1** to retract the depressed push button and deenergize the blender motor.

If the control knob **24** is rotated counterclockwise as viewed in FIG. **1** to position the follower pin **46** in the pocket **56,** the bias of the relatively strong power spring **48** would be removed from the actuator slide **61** and such that the blender operation would be controlled entirely by the push buttons **15, 17.** Thus, even though depressing one of the "speed" push buttons **15** would provide for shifting the actuator slide **61** to the right as viewed in FIG. **2,** the relatively light return bias provided by the leaf spring **78** would not be sufficient to return the cam interlock slide **16** when the push button

15 is released. Also, although the timer motor escapement wheel 28 would be released to permit operation of the timer motor, the pocket 56 is designed to lock the disc 31 against rotation by the timer motor. Also, a suitable shaft limit stop (not shown and which for example could be like that shown in the aforementioned U.S. Pat. No. 2,961,989) is preferably provided.

With the knob 24 in its zero position shown in FIG. 1, when a "speed" push button 15 is manually depressed, it would shift the actuator 61 to the right as viewed in FIG. 2 against the bias of the relatively strong power spring 48 such that the push button 15 would be automatically retracted by the power spring 48 when released. Thus, a "speed" push button 15 could be momentarily depressed for "flash" or momentary operation of the blender. This latter mode of operation would, however, be accompanied by release of the timer motor balance wheel 28 and therefore limited operation of the timer motor and such if the "speed" push button 15 were held depressed, for example for more than several seconds, the cam 31 would then hold the control lever 34 outwardly to deactivate the power spring 48.

A modified timer control mechanism 90 is shown in FIG. 3. In this embodiment, a separate escapement wheel lock 92 is pivotally mounted on the timer frame 37 and biased into engagement with the escapement wheel 28 by a light tension spring 94 to restrain the escapement wheel against rotation in the counterclockwise direction as viewed in FIG. 3. the reciprocable actuator slide 91 (which corresponds to the actuator slide 61 in the embodiment of FIG. 2) has a pair of elongated slots 97, 98 which respectively receive a fixed pin 100 and the control lever pin 67. The relatively strong lever power spring 49 is connected between the control lever pin 67 and an upstanding tang 101 of the timer frame 37. A second spring 103 is mounted on upstanding tang 101 with its end portion 102 in engagement with an inclined tang 104 of the actuator slide 91 to bias the actuator slide 91 to its retracted position shown in FIG. 3. Thus, with the control lever 34 in its outer or extended position in engagement with the outer edge of the inner cam disc 31, the light leaf spring 102 permits the actuator slide 91 to be shifted to the right as seen in FIG. 3 by the switch interlock slide 16 when a push button 15 is depressed. Also, as with the embodiment of FIG. 2, at the end of a preset time interval when the control lever 34 is suddenly released to be returned to its retracted position by the power spring 49, the slide 91 is impacted by the lever pin 67 with a substantial force to shift the interlock slide 16 and retract any depressed push button to deenergize the blender.

The actuator slide 91 has a forward depending end or nose 106 which is engageable with an upstanding tang 108 of the balance wheel lock 91 only when the control lever 34 is in its outer pivotal position where the follower pin 46 rides on the outer edge of the inner disc 31. Thus, with the control lever 34 in its retracted position shown in FIG. 3 or with the control lever 34 in its partially extended position with the follower pin 46 received within the pocket 56 of the inner cam disc 31, the actuator slide 91 cannot be shifted to engage and release the balance wheel lock 92. The foregoing control of the engagement of the nose 106 of the actuator slide 91 with the pivotal lock 92 is provided by the inclination of the slot 98 in the actuator slide 91 and such that the nose 106 of the actuator slide is lowered sufficiently to engage the tang 108 of the pivotal lock 92 only when the lever 34 is pivoted outwardly sufficiently for the follower pin 46 to ride on the outer circumferential edge of the inner disc 31.

Consequently, in the embodiment of FIG. 3 the knob 24 can be initially preset to establish a desired time interval and when a selected "speed" push button 15 is then depressed the interlock slide 16 shifts the actuator slide 91 to the right as viewed in FIG. 3 to engage and then release the escapement wheel lock 92 to begin the timing cycle. At the end of the preset time interval, the lever 34 is suddenly released to permit the power spring 49 to retract the actuator slide 91 and the depressed push button 15 and simultaneously release the escapement wheel lock 92. Also, with the control lever 34 in its retracted position shown in FIG. 3, a "speed" push button 15 can be depressed to shift the actuator slide 91 against the bias of the power spring 49 which then provides for returning the actuator slide 91 and interlock slide 16 to retract the depressed push button 15 when the push button is released. The fixed pin 100 provides a limit stop for the actuator slide 91 such that the control lever 34 cannot be pivoted outwardly sufficiently to permit the actuator slide 91 to engage the pivotal lock 92. Thus, with the knob 24 in its zero position, operation of the actuator slide 91 by depressing a speed push button 15 does not release the escapement wheel 28 and the power spring 49 remains fully operable after any interval to return the actuator slide 91 and depressed push button when the push button is released. Similarly, when the knob 24 is rotated to deactivate the timer by positioning the control lever follower pin 46 in the pocket 56, the actuator slide 91 can be shifted against the light bias of the leaf spring 102 without engaging the escapement wheel lock 92 and therefore without activating the timer motor. Thus, the embodiment of FIG. 3 provides for three modes of operation: (a) a "preset" time mode with the knob 24 used to preset the time interval; (b) a "hold" or "zero time" mode (with the knob 24 in its "zero" position shown in FIG. 1) wherein the power spring 49 retracts the depressed push button 15 when released; and (c) an "indefinite time" mode wherein the blender motor remains energized after a push button 15 is depressed and until the stop button 17 is depressed.

As will be apparent to persons skilled in the art, various modifications, adaptations and variations of the foregoing specific disclosure can be made without departing from the teachings of the present invention.

I claim:

1. In a timer actuating device for being activated by and for actuating another associated device, comprising a shiftable controller mounted to be shifted between first and second positions thereof, drive spring means biasing the controller to its first position, a timer mechanism connected to the shiftable controller and settable to preset an established time interval and thereupon shift the controller from its first position to its second position against the bias of the drive spring means, the timer mechanism being selectively activatable to initiate the preset time interval and having timer mechanism controlled means for shifting the controller from its second position to its first position with the drive spring means at the end of the established time interval, the improvement whereupon the timer actuating device further comprises a shiftable actuator mounted to be shifted in one direction thereof from a

first position to a second position thereof by the associated device and to be shifted in the opposite direction to its first position to thereupon actuate the associated device, and interconnecting means for interconnecting the controller, actuator and timer mechanism, the interconnecting means comprising first connection means connecting the shiftable actuator and timer mechanism operative for activating the timer mechanism when the shiftable actuator is shifted from its first position to its second position and second connection means connecting the actuator and controller operable for shifting the actuator from its second position to its first position with the drive spring means for actuating the associated device when the controller is shifted with the drive spring means from its second position to its first position, the second connection means permitting independent shifting of the shiftable actuator between its first and second positions with the controller in its second position to permit the timer mechanism to be initially preset and then subsequently activated by shifting the actuator from its first to its second position with the associated device, and the second connection means permitting the controller to be shifted from its first position against the bias of the drive spring means by the actuator as the actuator is shifted from its first position to its second position with the associated device.

2. A timer actuating device according to claim **1** wherein the first connection means comprises releasable locking means for selectively locking the timer mechanism against operation and releasable by the shiftable actuator to activate the timer mechanism when the actuator is shifted from its first position to its second position.

3. A timer actuating device according to claim **2** wherein the releasable locking means is mounted on the shiftable actuator to lock the timer mechanism when the shiftable actuator is in its first position and to unlock and thereby activate the timer mechanism when the shiftable actuator is shifted to its second position.

4. A timer actuating device according to claim **1** wherein the first connection means comprises a releasable lock for the timer mechanism for selectively locking the timer mechanism against operation and engageable by the shiftable actuator to release the lock and thereby activate the timer mechanism when the actuator is shifted from its first position to its second position.

5. A timer actuating device according to claim **1** wherein the first connection means connects the contoller and actuator to permit the shiftable actuator to be shifted to its second position to activate the timer mechanism with the controller in its second position and to prevent such activation of the timer mechansim by the shiftable actuator with the controller in its first position

6. A timer actuating device according to claim **1** wherein the first connection means comprises a lost motion connection between the controller and shiftable actuator permitting the controller to be shifted from its first to its second position without shifting the shiftable actuator and operable to shift the actuator from its second position to its first position when the controller is shifted from its second position to its first position.

7. A timer actuating device according to claim **6** wherein the lost motion connection is a slot and pin connection.

8. A timer actuating device according to claim **7** wherein the slot is arranged to provide for displacing the shiftable actuator from a first inactive condition to a second active condition as the controller is shifted from its first to its second position to thereby condition the shiftable actuator for activating the timer mechanism when the actuator is shifted from its first to its second position.

9. A timer actuating device according to claim **6** wherein the drive spring means is operable through the lost motion connection to shift the acutator from its second position to its first position.

10. In a switch operated device having a two position switch for selectively energizing and de-energizing the device and having a shiftable switch member shifted in one direction when the switch is operated to energize the device and shiftable in the opposite direction to operate the switch to de-energize the device, and a timer actuating mechanism for shifting the shiftable switch member in its said opposite direction for de-energizing the device after a predetermined time interval, the improvement wherein the timer actuating mechanism comprises a shiftable actuator mounted to be shifted in one direction thereof from a first position thereof to a second position thereof by the shiftable switch member when it is shifted in its said one direction and to be shifted in the opposite direction from its second position to its first position to actuate the switch member in its opposite direction to de-energize the device, a shiftable controller mounted to be shifted between a first position thereof and a second position thereof, drive spring means biasing the controller to its first position, a timer mechanism presettable to establish a predetermined time interval and connected to shift the controller to its second position against the bias of the drive spring means when preset to establish a predetermined time interval and adapted to be selectively activated to shift the controller from its second position to its first position with the drive spring means after the predetermined time interval, and interconnecting means interconnecting the shiftable actuator, timer mechanism and controller comprising first connection means operable for activating the timer mechanism when the shiftable actuator is shifted from its first position to its second position, and second connection means operable for shifting the actuator from its second position to its first position with the drive spring means for de-energizing the switch operated device when the controller is returned to its first position with the drive spring means and which permits independent shifting of the actuator between its first and second positions with the controller in its second position to permit the timer mechanism to be initially preset and then subsequently activated by the switch when the switch is operated to energize the device and whereby the device will then be automatically de-energized after the predetermined time interval established by the timer mechanism.

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