ABSTRACT

A solid state watch includes along a forward edge thereof, adjacent the hand when the watch is mounted on the wrist, a laterally extending downwardly directed lever arm pivotably mounted on the body of the watch and actuable by upward pressure on a surface of a rearwardly flexed hand such that actuation of the read-out mechanism of the watch is actuable by the flexing of the wrist without any requirement of use of the other hand, the particular readout being dependent upon the duration of pressure on the lever arm and/or on the total number of consecutive actuations sequentially.

3 Claims, 6 Drawing Figures
WRIST-ACTUATABLE SWITCH

This invention relates to a novel switch for a wristwatch switching mechanism.

BACKGROUND TO THE INVENTION

Prior to the present invention, there have existed various types of watches including for example, those provided with lights having pressure-actuatable switches mounted within the watchband thereof, and more recently solid state watches having one or more actuation buttons for actuating read-out(s). In both types of these prior-noted watches, use of the hand of the other arm from which the watch is mounted on a person, was required for an actuation of the electrical system necessary for a person to observe the time. For example, in use of a watch of the type disclosed in U.S. Pat. No. 3,729,923, the dial cannot be observed at night without first applying pressure to the switch-actuating pivot element thereof by use of an opposite arm's hand or by pressing the wrist against some object while concurrently trying to see the dial. In like manner, the wrist band switch of U.S. Pat. No. 3,681,587 is similarly actuable of the circuitry thereof by exerting pressure onto the wrist band itself in order to close the electrical contacts thereof. Each of solid state watches of the U.S. Pat. Nos. 3,789,601 and 3,760,584, as well as the electronic timepiece of U.S. Pat. No. 3,603,073, include one or more actuation members which must be actuated by the hand of the free other arm from which the wristwatch is mounted.

Accordingly, for a person driving an automobile, or carrying packages in one or both arms, or otherwise having one of the two arms occupied by other functions, it is not only inconvenient for the person to position his watch in a manner such that it is viewable and readable, but additionally difficulty is caused in so-positioning the arm by virtue of the need to push the actuating button making possible a reading of the correct time by the person. Even more important, for the driver of an automobile or other vehicle, there is the hazard of losing control of the steering or other control of the vehicle, if and when a person has to divert both hands and his eyes all substantially simultaneously in order to make possible the determining of the time of day.

SUMMARY OF THE INVENTION

Accordingly, objects of the present invention include the obtaining of solutions to and/or avoidance of one or more problems and/or difficulties of the types discussed above, together with the obtaining of other novel advantages.

Another object, more particularly, is to provide a novel wristwatch actuatable at the will of the wearer without the necessity of use of an opposite hand or of pressing the watch against some adjacent object.

Another object is to obtain a wristwatch switch actuation mechanism actuatable by movement a wrist or hand carrying the watch.

Another object is to obtain a solid state watch having readout actuatable by the flexing of a wrist carrying the watch.

Another object is to obtain a solid state watch having one or more read-out circuits commonly actuatable by a same lever but separately actuatable in time and sequence, by a flexing of a person's wrist wearing the watch.

Other objects become apparent from the preceding and following disclosure.

One or more objects of the present invention are obtained by the invention as defined herein.

Broadly the invention may be defined as a wristwatch having the casing wristwatch support structure mountable on the wrist typically in a conventional manner as any known or desired wrist-watch, utilizing a time-keeping mechanism of any conventional or known or desired type, together with an electrical circuitry for facilitating the observing and reading of time by a person whenever the circuitry is actuated to thereby close an electrical circuitry switch as a result of a switch lever extending forwardly along the wrist from the watch toward the top of the hand such that by flexing rearwardly of the hand at the wrist contact of the flexed hand and/or wrist press the switch lever arm upwardly to the actuating position. In a preferred embodiment of the invention, the wristwatch works and mechanism thereof are solid state of a conventional or any desired type, such as for example those disclosed in various U.S. Pat. such as No. 3,760,584 to Dargent, and No. 3,789,601 to Bergey, the disclosures of each of which are hereby incorporated by reference in their entirety as a part of this disclosure. As in conventional typical watches, preferably watches of the present invention include a substantially flat lower face, but has along a leading lateral edge thereof, adjacent the hand of the wrist carrying the watch mounted thereon, as the watch would be positioned when mounted on the wrist, the switch lever arm being mounted to project a definite distance laterally toward the hand, and preferably downwardly, the downward projection at least a distal end portion of the lever arm serving to facilitate early contact therewith by the flexing surface of the wrist and/or hand adjacent the hand as the hand flexes upwardly, or downwardly — as the case may be, as dependent upon whether the watch is worn on the top of the wrist or alternatively on the bottom of the wrist. In a preferred arrangement, the lever arm is shaped to conform to the forward lateral edge of the watch casing adjacent the hand of the wrist carrying the watch, and such conformingly-shaped lever arm thereby representing in appearance an extension of the watch casing itself, or ornamentation thereof while concurrently serving to prevent any sudden-projecting changes in shape which might become caught on clothing or other objects as might injure the watch or the clothing or the like. As in conventionally and currently available solid state watches, there are for a preferred embodiment, connected as a part of the actuating circuitry and display circuitry, sequence-actuating switching elements actuatable or different subcircuits responsive to different actuating impulses, such as impulses of a sequence of two or more consecutive actuations within a predetermined time period, and/or such as the maintaining of an actuating signal continually for a predetermined period. As a part thereof, there is appropriate mechanism for returning the switch lever arm to its non-actuating position, such as typically a weak spring.

The invention may be better understood by making reference to the following Figures.

THE FIGURES

FIG. 1 illustrates an in-part elevation plan view of a wristwatch of a preferred embodiment of the present invention as it would appear in an activated readout state.
FIG. 2 illustrates an in-part side cross-sectional view as it would appear in a non-actuated state taken through the embodiment of FIG. 1 through the activation lever, the activation push-button and diagrammatically the switch and the support structure of the watch.

FIG. 3 illustrates an elevation side view as taken along lines 3—3 of FIG. 2.

FIG. 4 illustrates a diagrammatic view of a preferred embodiment conventional circuitry which might be embodied as a part of a wristwatch of the present invention, the present invention not being in a particular solid state circuitry, but the preferred embodiment of the present invention being a solid state watch.

FIG. 5 illustrates a side elevation view of a wristwatch of the present invention as it appears in a mounted state on a person's wrist adjacent the hand during an act of activation for readout.

FIG. 6 illustrates a side elevation view of a wristwatch of the present invention as it appears mounted in an alternate state on the bottom side of a person's wrist — as some persons prefer to wear their wristwatch — adjacent the hand during an act of activation for readout.

DETAILED DESCRIPTION

An understanding of the present invention is not difficult since the invention is not any complicated mechanism nor any particular high level state of electronics, but the invention rather residing in the novel concept and structure embodying that concept of a special lever extending laterally toward the hand and preferably slightly downwardly, when the watch is mounted on the wrist closely adjacent to the hand as in the positions illustrated in alternate positions of FIGS. 5 and 6, such that the twisting or flexing of the wrist upwardly and rearwardly or backwardly as the FIG. 5 position, or flexing the wrist downwardly and rearwardly as the FIG. 6 position, serves to depress the activation readout button of a convention well-known type, preferably for a solid state diode readout wristwatch as illustrated in the Figures.

Accordingly, FIG. 1 illustrates the solid state wristwatch 7 having the novel actuation lever 8 illustrated also in each of FIGS. 2, 3, 5 and 6. As best illustrated in FIGS. 2 and 1, pressure in direction 10 as shown in FIGS. 1, 2, 3, 4 and 5 serves to push inwardly axially the even-constantly outwardly spring-biased button 11 typically as spring-biased outwardly as diagrammatically illustrated for spring 12 of FIG. 4, the pressure of the flexed hand pressing the lever 8 to in-turn press the button 11 sufficiently to overcome the button 11 spring-biased action of spring 12 such that the switch arm 21 of FIG. 4 closes circuit with the electrical contact 22 of switch 14 to thereby activate the readout conventional solid state mechanism. The lever 8 pivots on the pin 9 mounted on the casing structure 41 which includes band-mounting structures 42a and 42b. FIG. 1 illustrates the diodes 31 of watch face 37 in an activated readout state as reading-out time as 12:50 for example as the readout might appear when activated by illustrated flexed wrist positions of either FIG. 5 or FIG. 6, when mounted on the wrist 16 by a conventional but substantially snug watchband 15 closely adjacent the hand 17, such that in FIG. 5 the upper hand portion 17a applies pressure in direction 10 and in FIG. 6 the hand portion 17b applies pressure in direction 10. In FIG. 2, in phantom lines the closed switch position is also illustrated as it would appear when pressure is applied along direction 10; there is shown a conventional type gasket of any desired material that would seal the inner works against moisture, such as a TEFLON (trademark) gasket, for example, and which would not bind axial movement of button 11.

The FIG. 4 diagrammatic circuit illustrates merely a typical conventional solid state circuitry for a diodes readout circuit. In particular, power source 18 provides power by leads 36 and 20 from common lead 19, and from lead 20 to contact lever arm 21 which when closed transmits (carries) the electrical signal to the electrical contact 22 to lead 23 to multiple-actuation selector conventional switch 24 which upon a first single actuation directs the electrical impulse through lead 26, but upon a second sequential actuation within a predetermined short time period after the initial first actuation switches the electrical impulse to lead 25 while terminating electrical signal impulses to lead 26. Typically the lead 25 directs the electrical impulses or signal to a month and date readout subcircuit of diodes, such as a subcircuit 28, and typically lead 26 directs electrical signal to time switch 32 which initially directs a signal through lead 33 to a subcircuit 29 which causes readout of the hour and minutes of the day, and after sustained signal (as in present conventional watches) the switch 32 terminates signal to lead 33 and directs the electrical signal to lead 27 which typically activates a second readout on the diodes subcircuit 30, the total diodes readout circuitry being referred to as diodes 31, the solid state time mechanism being diagrammatically represented by the box 34 of FIG. 4 which sends its signal by lead 35. Electrical return leads are illustrated by return leads 38 and 39 to common lead 40 which returns to the power source 18. Diagrammatically, the spring 12 is mounted on structure 13 of the watch casing as a support against which the spring 12 biases upwardly against the lever 21 to hold the switch 14 in a normally open-circuit state.

It is within the scope of the present invention to make such modifications and substitution of equivalents as would be apparent to a person of ordinary skill.

1. A wristwatch switch device comprising in combination: a wristwatch support structure, wristwatch means for keeping time mounted on the wristwatch support structure, and electrical time-display circuit means for facilitating the observing and reading of time-indicating indicia when the electrical time-display circuit means is actuated, the electrical time-display circuit means including a switch means for making and breaking electrical circuit, the switch means including a switch lever arm mounted on said wristwatch support structure adjacent a lateral edge of the wristwatch support structure and projecting laterally from the lateral edge a first predetermined distance sufficiently for actuation thereof by contact with a person's hand or wrist upon intentional flexing of a person's hand having the support structure mounted on the wrist adjacent the hand such that the hand or wrist is thereby permissible against the switch lever arm, said switch lever arm projecting also a second predetermined distance downwardly at least a distal portion thereof such that early contact therewith upon a flexing of the wrist is facilitated.

2. A wristwatch switch device of claim 1, in which said switch lever arm projects also a second predetermined distance downwardly at least a distal portion thereof such that early contact therewith upon a flexing of the wrist is facilitated.
3. A wristwatch switch device comprising in combination: a wristwatch support structure, wristwatch means for keeping time mounted on the wristwatch support structure, and electrical time-display circuit means for facilitating the observing and reading of time-indicating indicia when the electrical time-display circuit means is actuated, the electrical time-display circuit means including a switch means for making and breaking electrical circuit, the switch means including a switch lever arm mounted on said wrist-support structure and projecting laterally from the lateral edge a first predetermined distance sufficiently for actuation thereof by contact with a person's hand or wrist upon intentional flexing of a person's hand having the support structure mounted on the wrist adjacent the hand such that the hand or wrist is thereby pressable against the switch lever arm, said electrical time-display circuit means including sequence-actuation switching elements actuable of different subcircuits of the electrical time-display circuit means, the sequence-actuation switching elements being actuated responsive to different predetermined numbers of sequential actuations of the switch lever arm, the switch means including a biasing element biasing the lever into a normally open-circuit switch position.

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