

[54] ALARM WRIST WATCH

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[57]

ABSTRACT

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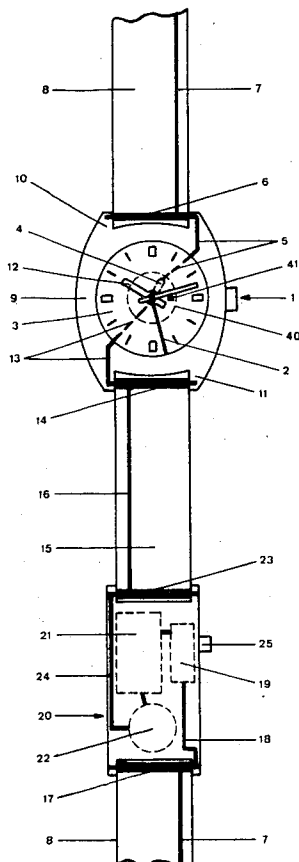
An alarm wrist watch incorporating a watch band, a watch casing and an electro-acoustical signal transmitter which can be activated by the watch movement or clockwork at pre-selected signalling times. The electro-acoustical signal transmitter is arranged at a part of the watch band removed from the watch case.

[56] **References Cited**

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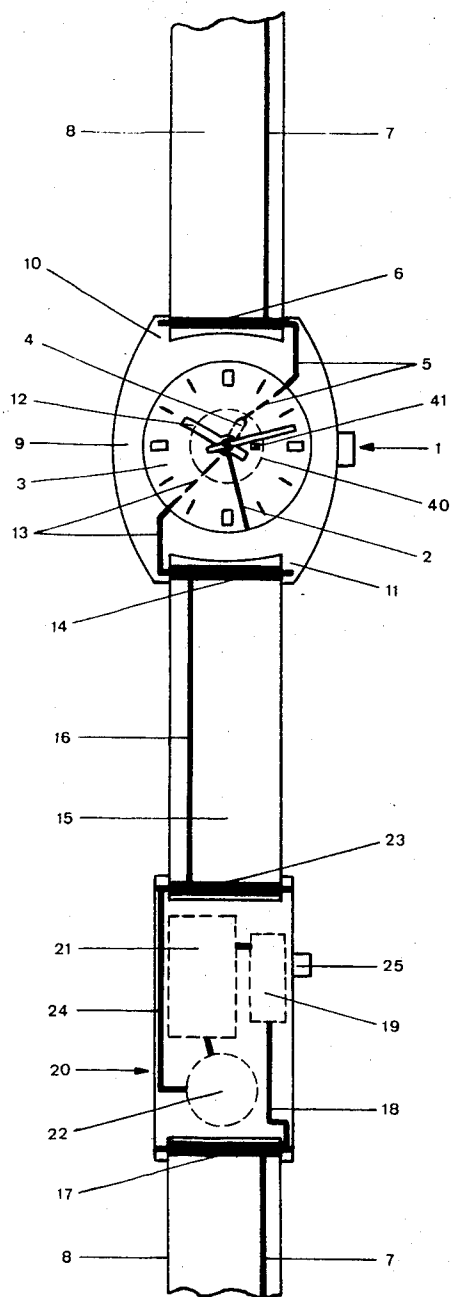
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3 Claims, 1 Drawing Figure



PATENTED JAN 29 1974

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ALARM WRIST WATCH

BACKGROUND OF THE INVENTION

The present invention relates to a new and improved construction of alarm wrist watch having a wrist watch band, a watch case or housing and an electro-acoustical signal transmitter which can be triggered by the watch movement at pre-selectable signalling times or time points.

The development of miniaturized electro-acoustical signal transmitters has been responsible for the advent of such alarm wrist watches. The known wrist watches of this type, however, possess the appearance and dimensions of a more sporty-type watch, that is to say, more like a rather bulky or non-flat wrist watch for men possessing a relatively large diameter. This dimensional size of the watch is predicated upon the multiplicity of different groups of elements which must be accommodated at the common watch case or housing. These elements or components can be enumerated, for instance, as the actual watch movement, the signal transmitter, the current source and a switch for selectively switching-in and switching-out the signal transmitter.

Apart from the fact that owing to this multiplicity of groups of structural elements the minimum size, and especially the minimum thickness of the watch, cannot be reduced below a size which is much greater than that required for other wrist watches, such multiplicity of groups of structural elements further requires a particularly complicated shaped watch case or housing and generally also the use of a special watch movement.

The complicated configuration of the known watch cases of watches of the aforementioned general character, apart from the actual number of different groups of structural elements, is also attributable to the fact that such structural element groups each require a respectively different maintenance. While the watch movement or clockwork is constituted by a group of components having fairly great as possible longevity, and must be placed in the hands of a skilled watchmaker for servicing or the like, the current source and also the signal transmitter and switch constitute structures of less longevity which should be easily accessible so that, if necessary, even the user of the watch has the possibility of carrying out ready replacement thereof.

On the other hand, with conventional battery-operated wrist watches, that is to say, those without any signal transmitter, for instance of the type known from Swiss Pat. No. 348,661, German petty Pat. No. 1,827,392 and French Pat. No. 1,205,272, it has already been proposed, owing to a certain lack of space in the watch case or housing, to remove the battery and a part of the electrical circuit belonging to the electrical movement out of the watch case, so that such can be designed more delicately and aesthetically. Thus, it is already known in the art to arrange externally of the watch case movement-powering components (and not components controlled by the movement).

Accordingly, it would be also basically conceivable to employ the same measures for the same purpose with an alarm wrist watch of the previously mentioned type, without however dislodging the electro-acoustical transducer from the watch case because thereby the watch case itself would have to be surrendered as the resonance box and along therewith there would be re-

duced the acoustical efficiency of the signal transmitter.

SUMMARY OF THE INVENTION

Hence, with the foregoing background of the state-of-the-art in mind it is a primary object of the present invention to provide an improved construction of alarm wrist watch of the previously mentioned type wherein it is not only possible to considerably reduce in size the watch case in comparison with the known alarm wrist watches, but also to considerably increase the awareness of the user to the electro-acoustical signal transmitter by means of the human sensory organs, something which is important for an alarm type watch piece.

A further significant object of the present invention relates to a new and improved construction of alarm wrist watch which contains a novel arrangement of the components of the wrist watch to allow for a relatively small dimensional size of the watch in comparison to the prior art alarm wrist watches, and therefore to render same more attractive and pleasing to the eye.

Now in order to implement these and still further objects of the invention, which will become more readily apparent as the description proceeds, the alarm wrist watch proposed by this development is manifested by the features that the electro-acoustical signal transmitter is arranged at a portion of the watch band removed or remote from the watch case.

In this way there is not only realized the primary aimed for reduction in the external dimensions of the watch case, but beyond such there is also realized an effect as concerns the alarm aspects of the watch which is no way rendered obvious by any of the heretofore known watches and more than compensates for the already mentioned reduction in the acoustical efficiency of the signal transmitter. As is well known wrist watches are generally worn in a manner where the watch case with the dial comes to bear at the side of the wrist facing away from the body of the user. At this side of the user's wrist the sense of touch is less well defined than at the remaining portions of the wrist. Furthermore, as a general rule most people adjust themselves so rapidly to wearing a wrist watch that, even after a short period of time, the wearer is no longer conscious of the presence of the wrist watch, especially the larger weight of the watch casing with the watch movement. The sense of touch therefore becomes even less delicate exactly at the side of the wrist facing away from the body.

On the other hand, it should be readily apparent that the noise output of electro-acoustical signal transmitters which are suitably miniaturized for such wrist watches is not unlimited, especially if they are arranged externally of a hollow compartment or cavity serving as a resonance box. Such signal transmitter is therefore, by its very nature, not always capable of exceeding the random sounds of the surroundings which may be present at any given time.

Now if the electro-acoustical transducer is left in the watch case, then owing to the resonance action with the housing, there is indeed attained a somewhat greater noise output of the signal transmitter. But where the user of the watch is hard of hearing, or in a situation where there is present a high surrounding noise level, then there exists the danger that the acoustical signal of the signal transmitter will not reach with

sufficient intensity the wearer's hearing and be perceived by him. This is even much more the case because for most of the carrying locations of the wrist watch which generally arise during use the signal transmitter in most positions of the lower arm of the wearer is located at the side of the wrist which faces away from the ear of the wearer, so that the primary direction of propagation of the sound waves occurs away from the wearer's ear. The acoustical output or efficiency of the signal transmitter might very well be quite high, but in practice it cannot be fully utilized, that is to say, the signal transmitter possesses an insufficient output as concerns the user perceiving the same.

Now with the watch construction of this development these drawbacks and risks which are prevalent with the known alarm wrist watches are extensively eliminated. During wearing of the watch the electro-acoustical signal transmitter is not located at that region of the wrist where by virtue of the presence of the heaviest part of the watch (watch case with watch movement) the sense of touch of the user has been deadened or diminished by becoming accustomed to wearing the watch, rather is present at a location where the touch sensitivity is considerably greater and additionally confronts the ear of the wearer. Consequently, the sound waves, even if they do not reach the hearing of the wearer with sufficient intensity nonetheless will be noticed, by virtue of this more sensitive location or point of the wrist, directly in the form of oscillations, approximately comparable to the fluttering of the wings of an insect.

If as the movement for the watch there is provided a spring mechanism, whether such is equipped with a manual winder or automatic winding, then advantageously also the battery, for instance a small disc or button battery cell, and the switch of the signal transmitter can be arranged at a part of the wrist watch band. Hence, there only remains in the watch case those groups of components which require servicing by a trained watchmaker, whereas the components which also can be exchanged by unskilled individuals are accommodated at the band of the wrist watch.

This arrangement brings with it a further advantage: Only two electrical conductors need be conducted away out of the timer or time piece (apart from the adjustment-and possibly the winding crown). Moreover, the watch case or housing can be completely accommodated to the raw or blank material and can be designed as delicate and flat as such permits this to happen, so that there are not required any special constructional measures in order to render the watch casing waterproof. Hence, the watch movement has imparted thereto the required protection without having to resort to any special constructional expenditure, and the casing remains relatively simple in construction, whereas the watch band offers space for the components which of necessity must be exchanged from time to time.

Finally, the last-mentioned arrangement also renders it possible to construct a ladies wrist watch or a chronograph with an alarm mechanism, practically without having to enlarge the external dimensions of the watch itself in comparison to simple ladies' watches and chronographs.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood and objects other than those set forth above, will become apparent

when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawing wherein the single FIGURE illustrates an exemplary embodiment of inventive alarm wrist watch.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Describing now the drawing, reference numeral 1 designates a conventional watch wherein, however, the setting or adjustment hand 2 is rigidly connected for rotation with a contact disk 40 arranged beneath the watch dial 3. The contact disk 40 is electrically connected with a conductor 5 which leads from internally of the casing or housing 9 to one of the pair of lugs or projections 11 for receiving therebetween the watch band, and specifically into the one bore for the associated spring pin 6. The contact disk 40 is moreover insulated with the exception of a small contact segment 41. Further details regarding a contact arrangement usable for this purpose are disclosed, for instance, in Swiss Pat. No. 487,454 or in the corresponding U.S. Pat. No. 3,611,702, to which reference may be readily had. The conductor 5 is therefore guided to such contact segment 41 and such possesses a rotational position determined by the setting hand 2. Consequently, the spring pin 6, which hingedly connects the part or strap 8 of the wrist watch band with the wrist watch 1, is electrically connected with the contact segment 41. Leading from the spring pin 6 is a conductor 7 which is completely embedded at the strap part 8 of the wrist watch band, this conductor 7 leading to a spring pin 17, which, in turn, hingedly connects the strap part 8 of the band with the buckle or closure part 20 of the band.

In the exemplary embodiment under consideration the wrist watch is provided with an "endless" band which can be shortened by means of a so-called conventional strapping or tightening buckle or clasp in order to be fixedly tightened about the wrist of the user.

The hour indicator 12 is electrically and rigidly connected for rotation with a contact arm 4 which wipingly moves across the contact disk 40 below the dial 3. Additionally, the hour indicator 12 is connected with a conductor 13 which, in turn is led from internally of the case or housing 9 of the watch 1 to the spring pin bore of the other band lug pair 11. The hour indicator 12 also can be electrically connected with a dial consisting of conductive material, in which case the conductor would then first be connected to such dial. At the band lug or bracket pair 11 a spring pin 14 is in conductive connection with the conductor 13 on the one hand and with a conductor 16 on the other hand, conductor 16 being embedded at the part or strap portion 15 of the band. The conductor 16 is furthermore connected to an additional spring pin 23 which connects the closure or clasp portion 20 pivotably with the part 15 of the band.

At the buckle portion 20 a conductor 18 leads from the spring pin 17 to a switch 19 which can be actuated by means of a knob or button 25. The other connection or terminal of the switch 19 is coupled with a miniaturized buzzer 21 defining the electro-acoustical signal transmitter, for instance of the type disclosed in Swiss Pat. No. 497,760, the other connection or terminal of which is coupled with a battery 22, for instance a conventional disk cell of the type used for hearing aids. The other pole of the battery 22 is coupled through the

agency of a conductor 24 embedded at the closure or clasp portion 20 with the spring pin 23 which, as mentioned, is connected via the conductor 16 with the hour indicator or hand 12 and the contact arm 4 respectively.

As long as the switch 19 is closed the buzzer 21 is thus switched-in, as soon as its power supply circuit is closed via the closed switch 19- conductor 18- spring pin 17- conductor 7- spring pin 6- conductor 5- contact segment 41- contact arm 4- conductor 13 or dial respectively- spring pin 14- conductor 16- spring pin 23- conductor 24 and battery 22. This is then the case when the hour indicator or hand 12 has reached the signalling time point determined by the adjustment or setting indicator 2 according to its setting. In order to shut-off the buzzer or acoustical generator 21 it is sufficient to actuate the switch 19.

The advantages of the described watch should be self-evident. The watch movement, which can be a standard movement and need only be amplified by the contact arm 4, the setting indicator 2 as well as the contact disk 41 and the conductor 5 as well as possibly conductor 13, is accommodated in a casing 9 which extensively corresponds to the standard dimensions, in other words a flat casing or housing 9. Without any particular constructional expenditure such can be readily rendered waterproof. The components of less longevity, namely the battery 22, the buzzer 21 and the switch 19 are arranged at the closure or clasp portion 20 and at that location easily accessible, without having to open the casing 9 of the watch. Even if the band closure portion 20 with the therein mounted group of components should become defective, for instance owing to damaging same through improper handling, then the watch 1 itself still remains completely functional.

In the event that the watch case 9 is formed of metal, that is electrically conductive, and likewise the arm band 8, 15, then it is only necessary to lead a conductor in insulated fashion to the buckle or closure portion 20. In this case the arm band and the casing provide a return flow path for the current. On the other hand, if there is provided an arm band with a belt buckle or prong type closure, then, both conductors 7, 16 can be embedded in the same band section in order to maintain the watch fully functional, for instance as an alarm watch, when such is also placed in a flat or laid out condition.

Even exchange of the arm band does not present any particular difficulties, since the use of spring pins is almost the general rule for wrist watches. Care only need be taken to ensure that, for instance, with the embodiment under consideration the spring pin 14 is connected with the spring pin 23 and the spring pin 17 with the spring pin 6.

The development of this invention is also particularly advantageous if it is designed, as already mentioned as a wrist chronograph or a ladies' wrist watch. Generally, certain maximum external dimensions should not be exceeded with a wrist watch so that its practical handling can be ensured. Especially in the case of chronographs particularly with automatic winding, with their second- as well as possibly minute- and hour indicators driven by the same movement, however over separate transmissions as well as equipped with resetting mechanisms with knobs, the above-mentioned maximum external dimensions in any case already presents quite considerable difficulties to those skilled in the art to sensibly accommodate all of the mechanisms in a casing or housing which still possesses sufficient aesthetic appeal. Similar considerations are applicable in the case of ladies' watches where generally there is strived for as extensive as possible delicateness of the watch. Only by means of the development of this application is there rendered possible, for instance, the production of a ladies watch, with electrically operated signal transmitter, without diminishing the delicacy of a watch which is without a signal transmitter.

While there is shown and described present preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, but may be otherwise variously embodied and practiced within the scope of the following claims. Accordingly,

What is claimed is:

1. An alarm wrist watch having a band, a watch case and an electro-acoustical signal transmitter which can be triggered by the watch movement at pre-selectable signalling time points, the improvement comprising arranging the electro-acoustical signal transmitter directly at a part of the band removed from the watch case, said part of the band at which there is arranged said electro-acoustical signal transmitter being connected with the watch case by a flexible section of the band, so that when the alarm wrist watch is worn by a user the watch case and electro-acoustical signal transmitter are automatically located at considerably spaced peripheral locations about the wrist of the user, to thus provide increased sensitivity of the user to response of the electro-acoustical signal transmitter.

2. The alarm wrist watch as defined in claim 1, wherein the band incorporates a closure portion located substantially diametrically opposite the watch case, said signal transmitter being arranged at the closure portion.

3. The alarm wrist watch as defined in claim 2, further including a current source for powering the signal transmitter, said current source being arranged at the closure portion of the band.

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