

WRIST WATCH

5 This invention relates to wrist watches, for example, having a watch band made of metal or a ceramic material.

10 Recently, factors such as low price and sense of fashion have become important for the commercialisation of wrist watches. Hence, a relatively complicated configuration and a novel feeling are needed. To meet such a demand, there has been proposed a wrist watch in which both the watch case and watch band are formed by, for example, casting, sintering or powder moulding using a metal or other material, such as a ceramic material. Thus the watch case and the watch band of the wrist watch provide a feeling of a single or integral piece.

15 In such a wrist watch, the watch band is secured to the watch case as follows. Two pairs of projections, which project from opposite sides of the watch case, are each provided with a pin hole. Each end of the watch band also has a pin hole formed through it. The ends of the watch band are interposed between the corresponding pairs of projections, and a locking pin is inserted into a pin hole of one of the projections, and is then passed through the pin hole of the watch band to the pin hole of the other projection. In this fashion, the watch band is secured to the watch case.

20 Such a securing structure requires pin holes to be formed through the projections of the watch case and at the ends of the watch band, thus causing a considerable increase in machining cost and loss of valuable material. Moreover, the pin holes must be drilled with relatively high accuracy to attach the watch band to the watch case to provide the wrist watch with a feeling of

a single or integral piece, and this further raises manufacturing cost.

Furthermore, the conventional wrist watch is disadvantageous in that it is considerably degraded in appearance, i.e. sense of fashion, since the pin holes through the projection and the ends of lock pins are visible at the outer surfaces of the projections.

The present invention seeks to provide a wrist watch which is made of a material such as metal or ceramic material, and in which the watch band is secured to the watch case with relatively high accuracy and low production cost thereby to produce an excellent appearance compared to conventional wrist watches.

According to the present invention, there is provided a wrist watch comprising: a watch case and a watch band, the watch case including a pair of securing recesses in opposite sides of a case frame and a pair of attachment pins mounted in the recesses, the watch band including attachment means on each end thereof for engagement with the corresponding attachment pin, the watch case with attachment pins and the watch band being formed by casting, sintering, or powder moulding, the attachment means comprising an attaching link and a securing plate adapted to be secured to a lower surface of the attaching link so that the respective attachment pin is clamped between the securing plate and the attaching link, at least one of the lower surface of each attaching link and an upper surface of the corresponding securing plate is provided with a pin groove for

receiving the respective attachment pin, and fastening means for fastening the securing plate to the attaching link.

5 The attachment pins ^{are} ~~may be~~ formed together with the watch case to be positioned with a high degree of accuracy. The pins may be formed in the respective attaching links during formation of the latter, again with a high degree of accuracy. The watch band is thus attached to the watch case with a high degree of
10 positional accuracy, and this provides a feeling of a single piece or integral watch case and watch band.

It is not necessary to drill pin holes and this reduces manufacturing cost, improves appearance and eliminates the loss of material due to drilling of the
15 pin holes.

Preferably the pin groove is provided only in the lower surface of the respective attaching link.

In one embodiment each pin groove extends across the watch band, and the respective attaching link is
20 connected to one or more adjacent links of the watch band by means of a connection pin passing through a further pin groove in the attaching link.

Each securing recess may be defined by two pairs of projections extending from opposite sides of the case frame, the attachment pins extending between the
25 projections.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:-

Figure 1 is a fragmental exploded perspective view
30 of a wrist watch according to the present invention;

Figure 2 is a perspective view illustrating a watch case and a watch band of the wrist watch of Figure 1 when united; and

Figure 3 is an enlarged sectional view taken along

the line III - III in Figure 2.

Figures 1 and 2 illustrate a wrist watch according to the present invention, in which a case frame 1A of a watch case 1 and a watch band 2 are made of the same material. The material used may be metal or a ceramic material. The case frame 1A is provided at each of its opposite sides 1B thereof with a pair of substantially parallel projections 3, 4. The two pairs of projections 3, 4 project away from each other. Each pair of projections 3, 4 and the corresponding side 1B of the case frame 1A defines a fitting recess 1C. An attachment pin 5 extends between each pair of projections 3, 4.

The case frame 1A with the pairs of projections 3, 4 and the attachment pins 5 is formed as a single integral part by either casting, sintering or powder moulding. The formation by powder moulding includes, for example, the steps of: fabricating a metal pattern; fabricating a rubber pattern; cutting the rubber pattern; fabricating a wax pattern; correcting the wax pattern; assembling the wax pattern; burying the wax pattern in an investment material; de-waxing; casting; and finishing. The formation by sintering includes, for example, the steps of: mixing a metallic powder with a binder; injection moulding the mixed material into a die; de-binding; sintering; and post-processing. The formation by powder moulding includes, for example, the steps of: injection moulding a metallic powder into a die; pressurised sintering; and post-processing.

The watch band 2 includes two rows of outer links 6, 7 and one row of connection links 8 interposed therebetween. Corresponding outer links 6, 7 and two connection links 8 are joined through connection pins 9.

At each of opposite ends 2A of the watch band 2, the connection link 8 is joined to a attachment link 10 through a connection pin 9 (Figure 3). Each attachment link 10 is substantially the same shape as each connection link 8.

As shown in Figure 3, each attachment link 10 is provided in a lower surface thereof with a pin groove 11 which extends across the watch band. The pin grooves 11 are to receive respective attachment pins 5. The attachment link 10 is further provided at a lower surface 10A with a female screw hole 12. A securing plate 13 is fastened to the lower surface 10A of each of the attachment links 10 by threading a machine screw 14 into the female screw hole 12. Each attachment link 10 with its securing plate 13 fastened to it has the same shape as each of the connection links 8 as shown in Figure 3.

At least the exposed parts of the watch band 2, that is the outer links 6, 7, the connection links 8 and the attachment links 10, are formed of the same material by the same method as the case frame 1A.

The watch band 2 is attached to the case frame 1A of the watch case 1 as follows. Each of the attachment links 10 of the watch band 2 is fitted to the respective fitting recesses 1C between the corresponding projections 3, 4, and then the pin groove 11 thereof is placed over the attachment pin 5. One of the securing plates 13 is then fastened to the lower surface 10A of the attachment link 10 by one of the machine screws 14. In this manner, the watch band 2 is secured to the case frame 1A as shown in Figure 2, and thereby a single piece like joined structure of members is emphasised since the members are made of the same material and made by the same technique.

Although the pin groove 11 is shown as provided in each attachment link 10, it may be provided partly in the lower surface 10A of each attachment link and partly in an upper surface 11A of the corresponding securing plate.

As described above, the watch case 1 and the watch band 2 are fabricated by the same method, using the same material. However, the watch case 1 and the watch band 2 may be of different materials, and further may be formed by different methods.

CLAIMS

1. A wrist watch comprising: a watch case and a watch band, the watch case including a pair of securing recesses in opposite sides of a case frame and a pair of attachment pins mounted in the recesses, the watch band including attachment means on each end thereof for engagement with the corresponding attachment pin, the watch case with attachment pins and the watch band being formed by casting, sintering, or powder moulding, the attachment means comprising an attaching link and a securing plate adapted to be secured to a lower surface of the attaching link so that the respective attachment pin is clamped between the securing plate and the attaching link, at least one of the lower surface of each attaching link and an upper surface of the corresponding securing plate is provided with a pin groove for receiving the respective attachment pin, and fastening means for fastening the securing plate to the attaching link.
2. A wrist watch as claimed in claim 1 in which the pin groove is provided only in the lower surface of the respective attaching link.
3. A wrist watch as claimed in claim 1 or 2 in which each pin groove extends across the watch band, and the respective attaching link is connected to one or more adjacent links of the watch band by means of a connection pin passing through a further pin groove in the attaching link.
4. A wrist watch as claimed in any preceding claim in which each securing recess is defined by two pairs of projections extending from opposite sides of the case frame, the attachment pins extending between the projections.



5. A wrist watch substantially as herein described with reference to and as shown in the accompanying drawings.
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