

The present invention concerns watch cases of the type comprising a caseband obtained by manufacture in one piece with a dial, such assembly caseband - dial being formed of a natural mineral material.

Such a case is described and shown in the review SCHMUCK & UHREN vol. 39, Nr. 6, of June 1986 p. 6 under the title "Die Rockwatch".

This type of case has a particularly attractive aesthetic aspect. Nevertheless, because of the fragility of natural mineral materials, it is out of the question to attach marks or indices by riveting, driving or soldering. Furthermore, the printing of signs has up to the present not given a satisfactory result.

The purpose of the present invention is to provide a case such as defined hereinabove with which a decorative assembly is associated.

The above purpose is attained thanks to the fact that in the case such as defined hereinabove, said dial, from the side of its visible face intended for visualizing the hours and minutes, comprises a blind bed in which a cup is freely engaged and an element exhibiting the form and aspect of a cut stone is set and firmly maintained in place, such cup being glued by its base against the corresponding bottom of such bed.

It has in effect been determined that among the elements adapted to be employed as decoration, transparent cut materials such as diamond, sapphire but also glass, indeed plastic, give an aesthetically satisfying result. These elements, having very geometric forms, form a contrast with the random forms exhibited by natural mineral materials.

However, the attachment of an element having the form of a cut stone onto a dial of natural mineral material gives rise to some problems. It is out of the question to drive the element into a hole in the dial because of the fragility thereof. It is furthermore not possible to glue the element directly onto the dial, the iridescence of such element being destroyed. It is thus necessary to mount the stone on a setting.

Furthermore, it is necessary that the assembly system of the setting on the dial not give rise to extra thickness.

It is in employing a cup as setting and in burying it in a blind bed and in gluing it against the bottom of this bed that all the problems which have arisen have found their solution.

Watches are certainly already known provided with a decorative assembly using a cut stone, either in the caseband or in the dial.

The document JP-A-58 66 087 describes a method enabling the application of a decorative element of inorganic material such as a ceramic or a glass onto a watch case formed of a "superplastic" alloy. This method consists in depositing on the decorative element a thin metallic film, in arranging the decorative element superposed onto the case between two matrices, in heating the assembly so as to render plastic the metallic film and the case, then in applying pressure onto the two matrices so as to cause the decorative element to penetrate forcefully by inclusion into the material of the case.

However, such method may not be applied to a watch case of natural material such as granite, since such a material has no superplastic property or even plasticity or elasticity.

The document JP-A-60 80 784 describes a method of securing a decorative non-cut element onto a caseband, such method consisting also of depositing by evaporation a metallic layer onto the decorative element, then welding such layer of metal by a laser beam which is oriented into the element itself and which brings the layer of metal into fusion.

This method, which does not concern the application of a cut stone onto a dial of mineral material, may not in any case be applied to a cut stone since the cutting renders impossible the orientation of the laser beam.

The document CH-A-260 123 has as its objective a dial provided with cut stones secured by means of a ring driven from below the dial. The driving renders impossible the application of this arrangement to a dial of natural mineral material.

Furthermore, the document CH-A-609 517G describes a watch with stones mounted on envelopes and movable in an annular housing while document DE-A-3 307 817 describes a method for setting stones into a metallic dial.

Finally, the document FR-A-2 437 024 has as its object an extra-flat watch including a bezel in which are formed rectilinear slideways constituting beds for accommodating a crystal, the bezel being obtained on the one hand from the material of the caseband of said watch and, on the other hand, with a concave dial formed of metal such, for instance, as gold.

None of these documents either describes or suggests a method or a structure which responds to the problem here posed.

The cup which is engaged in accordance with the claimed invention in the blind bed of the dial holds the element which it contains perfectly in place and has no need to be

engaged by force into the lateral wall of its bed with the risk of causing cracking of the dial.

It thus creates no internal tension in the latter and the area of its bottom suffices largely for perfect adhesion.

Furthermore, in this construction, the border which the cup forms between the decorative element and the material of the dial further emphasizes the sought-after contrast.

The fragility of the natural mineral material poses, as has been mentioned hereinabove, problems which are difficult to solve.

Another purpose of the present invention is to minimize the effect on the strength of the case.

This purpose is attained thanks to the particular structure as shown by the case as in claim 2. In this case the visible face of the dial is concave and the bed intended to receive the element is located at the periphery of such dial.

The concavity of the dial reinforces the assembly case-dial and facilitates the machining thereof. By this manner the edge of the dial is raised up to the level of the crystal snap. In other words, the edge of the dial serves as a flange. There thus results therefrom a reduced space for the passage of the minutes hand. It is thus indispensable that the element take up a minimum amount of space in height. For this reason, the cup is buried in the bed. The hole, although relatively deep, does not affect the strength of the assembly. This probably comes about from the fact that it is located in the immediate neighbourhood of the strongest portion: the caseband.

The embodiments defined by claim 3 assure manufacture of the cup and setting of the element that it contains both simple and satisfactory. Furthermore, such folded down edge of the cup creates a welcome contrast with the visible face of the dial, in particular if it is polished and gilded or silvered.

In those defined by claim 4, the depth of the bed of the cup is much less than the thickness of the dial; it is almost equal to the height of the crown of said element which is relatively small.

Those defined by claims 5 to 7 seek to bestow on said element a certain brilliance, in particular if such element is formed only by a piece of glass, crystal, transparent plastic or of paste.

Finally, in those defined by claim 8, the decorative element which acts as a time indicating sign, facilitates reading of the time without changing the aesthetic aspects of the watch.

An embodiment of the watch case according to the invention and some variants are described hereinafter simply by way of example and through reference to the drawings in which:

- figure 1 is a radial cross-section at 3 o'clock of the caseband-dial of such case;
- figure 2 is a side view with a portion cut away of a part of figure 1 to a larger scale, and
- figure 3 is a plan view of the part shown on figure 2.

The caseband 1, shown on figure 1, is formed of a natural mineral material such as granite. It exhibits a bore 2 for the passage of a time setting stem (not shown)

of the watch, and a crystal snap 3 intended to receive a flat crystal of sapphire or tempered mineral material. This caseband 1 is integrally formed with the dial 4 of the watch.

Such assembly caseband/dial defines a housing 5 intended to receive the watch movement (not shown) as well as, in its periphery, a metallic ring (not shown) which, glued to the caseband, increases its strength.

The dial 4 shows a central opening 6 for the passage of axes (not shown) of the watch hands (not shown). The visible face 7 of the dial is concave, this conferring stability to the assembly caseband/dial and facilitating machining thereof. The edge of the face 7 joins the bottom of the crystal snap 3 and thus acts as flange. Finally, a circular cylindrical blind bed 8 with a flat bottom 9 is formed in face 7 at the periphery of the dial 4. A decorative assembly 10 representing the hour sign 3 o'clock is mounted in bed 8.

The assembly 10 is shown in detail on figures 2 and 3. It is essentially formed from an element 11 of transparent material showing a diamond cut or any other cut presenting an interesting aesthetic aspect. Such element 11 comprises thus a head 12 in which are cut several facettes 13 and a crown 14 which is also faceted and surmounted by a table 15.

For the sake of economy of the case, element 11 will be formed preferably by a piece of glass, crystal, transparent plastic or paste. Nothing however excludes the use of a diamond.

This element 11 is housed in a cup 16, the bottom 17 of which is flat and the lateral wall 18 of a circular cylindrical form. The upper edge 19 of the wall 18 is folded down at 19a above the rift 20 of element 11. It

thus forms a setting of this latter into cup 16 which holds it firmly in place.

Cup 16 is preferably formed of brass. The visible face of edge 19a is polished and preferably gilded or silvered in order to create a contrast with the granite of face 7 of dial 4. Such cup could also be formed of gold or silver.

The assembly 10 is secured to the dial 4 by gluing the base 17 of the cup 16 to the bottom 9 of bed 8. To avoid internal stresses in the dial 4, the diameter of the cup 16 will be slightly less than that of bed 8.

As is seen on figure 1, cup 16 is entirely buried in bed 8. It is thus at most the crown 14 of element 11 which will project from face 7 of dial 4. There remains thus an amply sufficient space between the table 15 of element 11 and the crystal (not shown) of the watch for passage of the hands.

A sign similar to that of figures 2 and 3 is secured to the dial 4 respectively at 12 o'clock, 6 o'clock and 9 o'clock. Similar signs could naturally also be mounted for each of the twelve hours of the dial. As a variant, a single one of these signs could also be provided at 12 o'clock only, or the latter could be distinguished from the others for example by its dimensions.

When element 11 is formed of a base material, it is possible to obtain a brilliance which recalls somewhat that of diamond by polishing the internal faces 21 of cup 16 to the point of reflecting light traversing element 11. In this case the interior of cup 16 is advantageously of conical form, the opening of the cone being chosen in a manner such that its surface is substantially parallel

to facettes 13. Such surface could even be coated with a coloured material.

With the purpose of obtaining an analogous effect, facettes 13 of the head 12 could also be covered with a reflecting layer coloured or not.



CLAIMS

1. Watch case of the type comprising a caseband (1) as well as a dial (4) integrally manufactured with the caseband, such assembly caseband-dial (1, 4) being formed from a natural mineral material such as granite for example, characterized in that said dial (4) from the side of its visible face (7) intended for visualizing hours and minutes, includes a blind bed (8) in which a cup (16) is freely engaged, an element (11) exhibiting the form and aspect of a cut stone being set and firmly maintained in said cup, such cup (16) being glued by its base (17) against the corresponding bottom (9) of said bed.

2. Case as in claim 1 characterized in that the visible face of the dial (4) is concave, in that said bed (8) is located at the periphery of said dial (4) and in that said cup (16) is buried in said bed (8).

3. Case as in claim 1 or 2 characterized in that said element (11) exhibits a diamond cut and that said cup (16) has a side wall (18) in circular cylindrical form the upper edge (19) of which is folded down on the rift (20) of said element (11) to constitute the setting of this latter.

4. Case as in claim 3 characterized in that at the most only the crown (14) of said element (11) projects from the visible face (7) of the dial (4).

5. Case as in claim 4 characterized in that the internal faces (21) of said cup (16) are reflecting.

6. Case as in claim 5 characterized in that the reflecting faces (21) of said cup (16) are coated with a coloured material.



7. Case as in claim 4 characterized in that the facettes (13) of the head (12) of said element (11) are furnished with a coloured reflecting material.

8. Case as in one of claims 1 to 7 characterized in that the assembly (10) formed from said element (11) and from the cup (16) acts as a time indicating sign.