

United States Patent
Hirabayashi

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[54] DIAL AND MOVEMENT FIXING
STRUCTURE FOR A WATCHCASE

[72] Inventor: Masahide Hirabayashi, Suwa, Japan

[73] Assignee: Kabushiki Kaisha Suwa Seikosha, Tokyo,
Japan

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[51] Int. Cl.....G04b 19/06

[58] Field of Search.....58/88 C, 88 M, 88.5, 94, 127 B

[56]

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Primary Examiner—Richard B. Wilkinson

Assistant Examiner—George H. Miller, Jr.

Attorney—Blum, Moscovitz, Friedman & Kaplan

[57]

ABSTRACT

The upper portion of an annular structure has surfaces for engaging the inner face and the periphery of a dial. The structure is notched to receive a projection at the periphery of the dial and to prevent thereby rotation of the dial.

10 Claims, 7 Drawing Figures

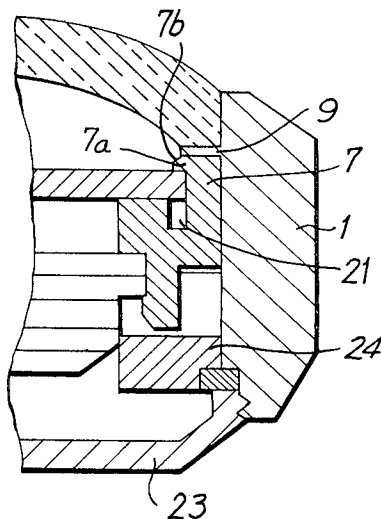


FIG. 5

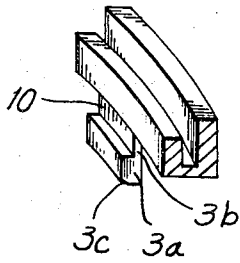


FIG. 6

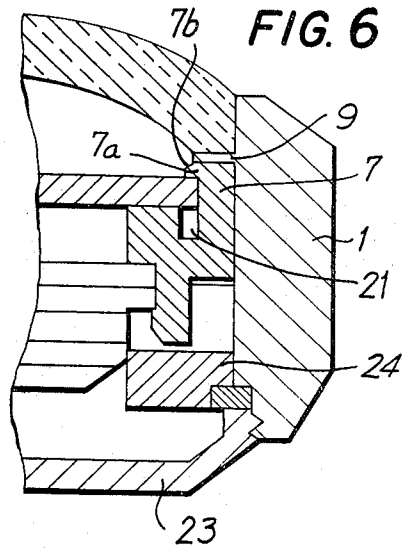


FIG. 7

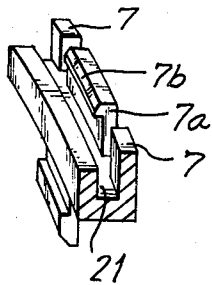


FIG. 1

PRIOR ART

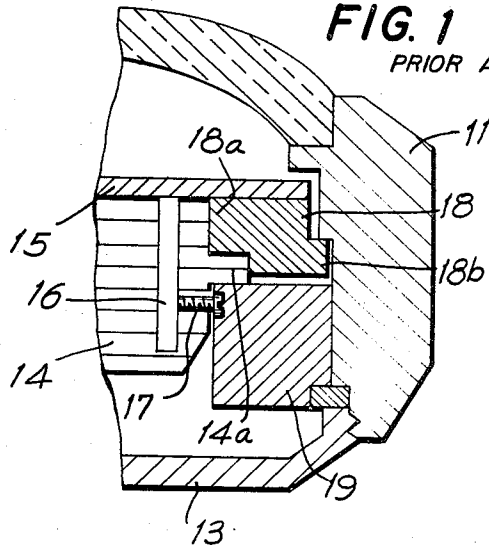


FIG. 3

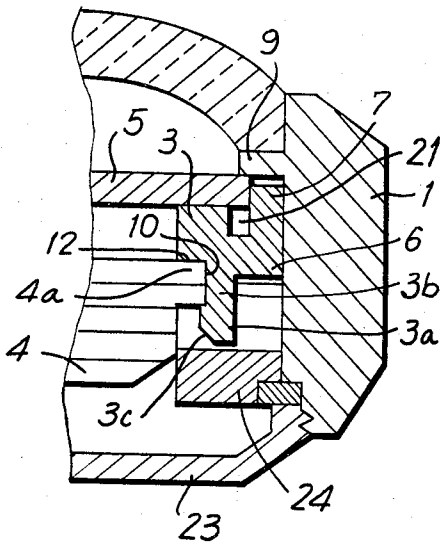


FIG. 4

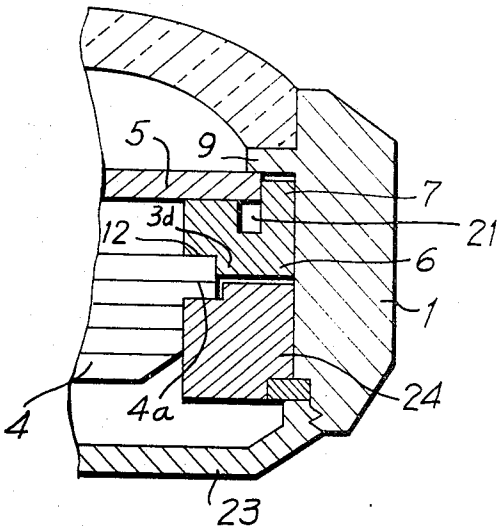
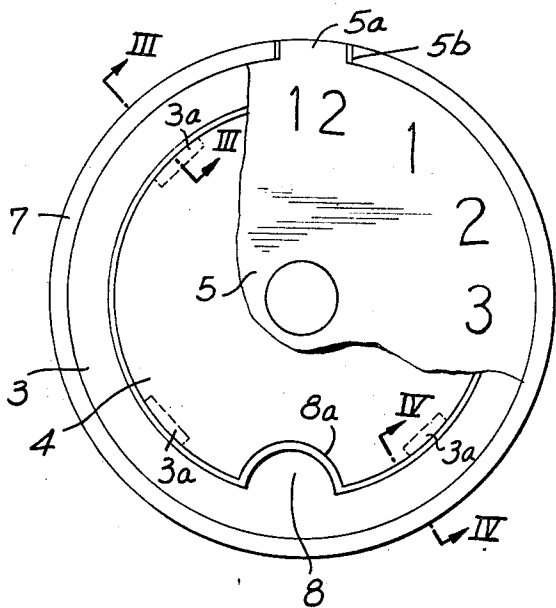


FIG. 2



DIAL AND MOVEMENT FIXING STRUCTURE FOR A WATCHCASE

BACKGROUND OF THE INVENTION

In the construction of a watch, it is necessary that provision be made for preventing rotation of the dial with respect to the watch movement. It is also necessary to prevent movement of the dial in an axial direction or in a direction transverse to the axis. In conventional watches the structure which fixes the dial against any of these movements is complex, difficult to assemble, relatively expensive and limited with respect to the materials which may be used in fabricating the dial.

SUMMARY OF THE INVENTION

Movement of a dial in a watchcase is prevented by means of an annular member fitting snugly in a watchcase. The annular member has surfaces which engage the lower face of the dial and the periphery of the dial. Furthermore, the dial has a projection at its periphery and the annular member has an opening which accepts the projection with minimum clearance; this combination prevents rotation of the dial with respect to the watchcase. The watch movement fits in similar fashion into the lower portion of the annular member. The movement is retained against the lower portion of the annular member by an inwardly directed flange. The annular member is sufficiently flexible so that the movement can be pressed into the lower portion of the annular member and held therein by snap action. If desired, the dial may be similarly held to the upper portion of the annular member.

Since both the dial and the watch movement are fixed in position relative to the annular member, they are fixed relative to each other.

Accordingly, an object of the present invention is a structure for holding fixed a dial in a watchcase against translational or rotational motion.

Another object is to hold fixed a watch movement in a watchcase against translational or rotational motion.

Still another object is to provide a structure for holding fixed a dial and a movement which is easy to assemble automatically, inexpensive and which permits that the dial be made of materials unsuitable for joining by conventional processes.

Still other objects and advantages of the invention will in part be obvious and will in part be apparent from the specification.

The invention accordingly comprises a product possessing the features, properties, and the relation of components which will be exemplified in the product hereinafter described, and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWING

For a fuller understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, in which:

FIG. 1 is a partial, sectional view in elevation of a watchcase of conventional construction;

FIG. 2 is a plan view of a watch in accordance with the present invention with a portion of the watchcase superior to the dial removed and with a portion of the dial broken away;

FIG. 3 is a partial sectional view taken along line III—III of FIG. 2;

FIG. 4 is a partial, sectional view taken along the line IV—IV of FIG. 2;

FIG. 5 is a view in perspective of a section of an annular member which holds a dial in place; FIG. 6 is a partial, sectional view of an embodiment of the invention; and

FIG. 7 is another embodiment of a section of the annulus which holds the dial and the movement in place.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The nature of the present invention may more readily be grasped by comparison with the construction of a watch with

conventional design such as is shown in FIG. 1. A watch case having an outer ring 11 and a case-back 13 holds a movement 14 and a dial 15. The dial 15 is prevented from rotation by means of legs 16 joined to the dial 15 by a technique such as soldering or welding. The legs 16 are fixed by screws 17 to a ring 19 fitting tightly within the outer ring 11. The dial 15 is prevented from moving toward the movement 14 by the guard ring 18. The movement 14 is prevented from axial dislocation by the flange 14a between the rings 18 and 19. The movement 14 is prevented from horizontal motion by means of the inner guard 18a. Axial location of the structure within the watchcase is determined by the flange 18b of the guard ring 18.

It will be noted that with this construction legs 16 must be affixed to dial 15, an operation which requires considerable skill. The cost of such an operation must be added to the cost of the legs 16 and the screws 17. Also, the ring 19 requires special construction for the reception of the head of the screws and the insertion of the screws is difficult.

The requirement that legs be fastened to the dial restricts the range of materials of which the dial may be made. For example the dials cannot be made of stone, ceramic or jewels because of the difficulty of affixing thereto legs. Although legs could be joined to an aluminum dial by heliarc welding, deformation would occur with a dial of the customary thickness.

The manner in which these difficulties are eliminated can be seen in the remaining figures. Turning first to FIG. 2, the dial 5 has a projection 5a at its periphery which fits within a notch 5b in a cylindrical portion 7 of an annular member 3. The projection 5a and notch 5b combination prevents relative rotation between the dial 5 and the annular member 3. The upper surface of the annular member 3 serves to locate the dial axially. The annular member 3 is further provided with inwardly directed flange sections 3a which hold the movement 4 by snap action. The movement 4 is fixed circumferentially to the annular member 3 by means of the projection 8 in the annular member 3 and the opening 8a in the movement 4. As is obvious, this relationship could be reversed with the projection being in the movement and the opening in the annular ring (not shown).

The dial is prevented from axial motion in the direction of the backcover 23 by means of the upper surface of the annular ring 3 which engages the inner surface of the dial 5. Motion in the opposite direction is prevented by the inwardly directed flange 9 on the case ring 1. Motion of the dial 5 in a direction transverse to the axis of the watch is prevented by the inner surface of the upwardly extending cylindrical portion 7 which is connected through the base 6 to the remainder of the annular member 3.

The watch movement is held axially against the lower surface of the annular member 3 by an inwardly projecting flange segment 3a. Insertion of the movement 4 into the annular member 3 is facilitated by the presence of a sloping surface 3c on the flange 3a. The downwardly projecting cylindrical member 3b preferably is not a complete cylinder but is segmented. As indicated by the dotted lines in FIG. 2, four relatively narrow segments are adequate to hold the dial 5. The shape of these segments can also be seen in FIG. 5.

The dial may also be held within the annular member 3 by means of snap action. For this purpose the upward-extending cylindrical portion 7 is fitted proximate its upper end with an inwardly extending flange 7a. To facilitate assembly of the dial into the annular member 3 the flange 7a has the diagonal guide surface 7b (FIGS. 6 and 7). As with the flange 3a, it is not necessary that the flange 7a extend around the complete interior of the cylinder 7. Instead, only three or four short segments of the cylinder 7 need be so equipped. This can be seen in FIG. 7 where only a short portion of the member 7 is equipped with the flange 7a. As would be expected the number of such segments should be at least three.

As stated, the annular member 3 should be composed of a flexible material, preferably a flexible plastic. The flexibility of the member is enhanced by providing the groove 21 between

the upwardly extending portions of the annular member 3. The flexibility is further enhanced by segmenting the cylinder 7.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above product without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. In a watch case, a dial-fixing structure, comprising a dial having an essentially circular periphery and a projection at said periphery, and a flexible, annular member comprising an upwardly directed first surface transverse to the axis of said member for engaging one face of said dial, and an essentially cylindrical, upwardly projecting portion surrounding said first surface, said cylindrical portion having an inner surface for engaging said periphery of said dial and having an opening therein for receiving said projection with minimum clearance, said annular member thereby providing for fixing said dial against movement radially, circumferentially and in one of the two axial directions.

2. A structure as defined in claim 1 wherein said cylindrical portion projects beyond said first surface by an amount less than the thickness of said dial, thereby making it possible for said dial to engage the interior surface of said watch case so that said dial is fixed against movement of said dial in the other of said axial directions.

3. A structure as defined in claim 1, wherein said annular member has therein a groove between said first surface and

said cylindrical portion, thereby imparting additional flexibility to said cylindrical portion.

4. A structure as defined in claim 1, wherein said cylindrical portion is segmented in a radial direction, thereby increasing said flexibility of said cylindrical portion.

5. A structure as defined in claim 1, wherein at least part of said upwardly projecting cylindrical portion has proximate the outer portion thereof an inwardly projecting flange so dimensioned that said dial can be engaged with said annular member by snap action.

6. A structure as defined in claim 5, wherein said inwardly projecting flange has a diagonal edge to facilitate insertion of said dial into said annular member.

7. A structure as defined in claim 1, further comprising a watch movement having an upper surface and a periphery, said annular member having a downwardly directed second surface for engaging the upper surface of said movement and a downwardly projecting cylindrical portion with an inner surface for engaging the periphery of said movement, one of said movement and said downwardly directed cylindrical portion having a projection and the other a notch for receiving said projection with minimum clearance, thereby fixing said movement radially and circumferentially with respect to said annular member and said dial.

8. A structure as defined in claim 7, wherein said downwardly projecting cylindrical portion is segmented.

9. A structure as defined in claim 7, wherein said downwardly projecting cylindrical portion has proximate at least a part of the outer portion thereof an inwardly projecting flange so dimensioned that said movement can be engaged with said annular member by snap action.

10. A structure as defined in claim 8, wherein said inwardly projecting flange has a diagonal guide surface for facilitating insertion of said movement into said annular member.

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