Aug. 7, 1962 H. SCHNEIDER ET AL 3,047,942

METHOD OF FIXING METALLIC RELIEF HOROLOGICAL FIGURES TO A METALLIC WATCH DIAL PLATE

Filed April 11, 1960

Fig. 1

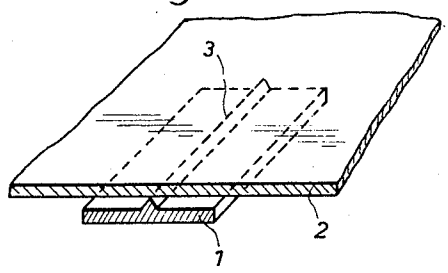


Fig. 2

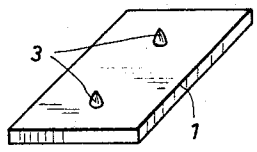


Fig. 3

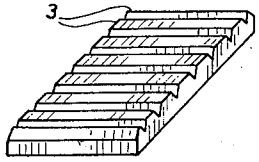


Fig. 4

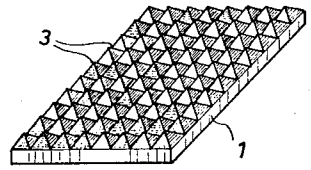
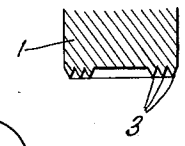


Fig. 6b



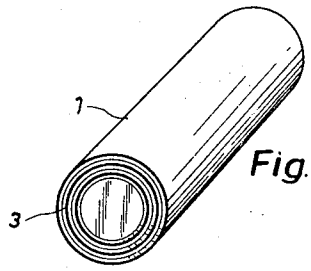


Fig. 6a

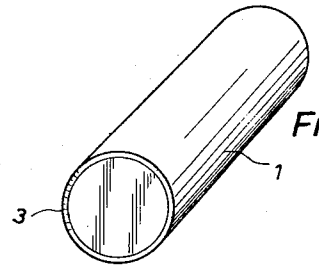
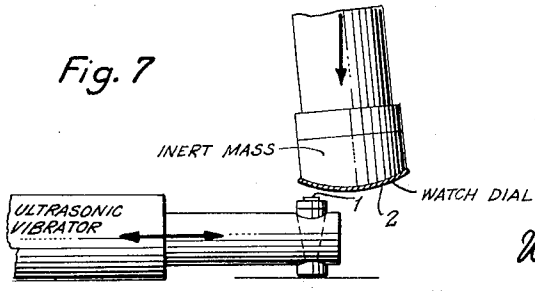


Fig. 5a

Fig. 7



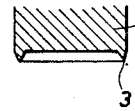


Fig. 5b

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METHOD OF FIXING METALLIC RELIEF HOROLOGICAL FIGURES TO A METALLIC WATCH DIAL PLATE

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When applying metallic relief horological figures to a metallic watch dial by electrical resistance welding it is well known in the art that the molten metal of one of the two parts to be assembled squirts out beyond the base of the figure, thereby forming rolls, pads or beards around the figure which impair the esthetical appearance.

It has been tried to overcome this drawback by providing one of the two parts to be assembled with one or more protrusions the surface of contact of which is smaller than the base of said figure and the other of the two parts with a recess or recesses dimensioned to receive said protrusion or protrusions with a certain lateral play. Thereby the rolls, pads or beards which are formed at the welding are expected to find place in the space thus formed between the protrusion and the walls of the recess.

The present invention has for its main object the provision of a method permitting applying of relief horological figures of metal to the metallic dial of a watch without any formation of pads, rolls or beards spoiling the appearance and also without any deteriorating effect on any insulating layer which may have been applied onto one or both of the parts to be assembled, for example the lacquer enamel layer which is usually provided to the outer surface of watch dials.

To this end the method of the present invention is characterized by the fact that the elements are fixed to the support by applying ultrasonic waves.

This method presents the great advantage that it permits to apply relief elements, e.g. dial figures, decorations, trademarks, symbols, pins etc. to a support such as a watch dial for example in terminated state, i.e. polished, lapidated, chamfered or the like or also vaulted when for example horological figures are concerned which shall be secured to already bellied dials.

Moreover this method has the advantage that it requires no special previous preparation of the support for receiving the relief figures as this is required for example by the provision of the recesses mentioned in the known afore described process.

Finally this method also affords for the applying of figures made of electrically non-conducting material to watch dials which also are non-conductive electrically.

The method of the invention shall now be described in more detail by way of example in the following description in which reference will be made to the accompanying drawings showing several embodiments of relief elements for carrying out this method. In these drawings:

FIG. 1 illustrates, in perspective view and partially in section a horological relief figure placed against a watch dial previous to the assembling of these two parts.

FIG. 2 shows, in perspective view, the surface to be fixed to a dial plate of another embodiment of a horological figure.

FIG. 3 illustrates, in a view similar to that of FIG. 2, a third embodiment of a horological figure.

FIG. 4 shows, still in a view similar to that of FIG. 2, a fourth embodiment of a horological figure.

FIGS. 5*a* and 5*b* are a perspective and sectional view respectively of the end face which shall be fixed to a watch dial in order that the latter may be secured thereby to the plate or to a part of the case of a watch.

FIGS. 6*a* and 6*b* finally show perspective and sectional views respectively similar to those of FIGS. 5*a*, 5*b* showing another embodiment of the end face of a pin for a watch dial.

FIG. 7 is a schematic representation of the method of applying the horological figures to the watch dial.

In FIGS. 1 to 4 of the accompanying drawing the relief elements are shown as horological figures **1** and the support to which these elements shall be fixed by the method of the invention is represented as a dial plate **2** shown in FIG. 1. On its surface which will contact the dial plate **2** the element **1** of FIG. 1 is provided with a rib or vein **3** extending in longitudinal direction over the whole length of the element. Of course it would also be possible, according to the dimensions of the element to provide the latter with two or more such ribs which also could extend in transverse direction of the element or there could be provided ribs in both directions. In the embodiment of FIG. 2 the relief element **1** is provided with several points **3**. These points could be replaced by bosses. In the embodiment illustrated in FIG. 3 the relief element **1** has its surface facing the support to which it shall be fixed formed with a row of ribs or edges **3** extending parallelly in transverse direction of the element while FIG. 4 shows an embodiment of the element **1** which in addition to the transverse ribs of FIG. 3 has a row of parallel ribs extending in longitudinal direction formed in it so that its surface destined to be fixed to the support **2** is covered with points as is clearly visible from FIG. 4. Finally it would be possible to provide the surface of the element **1** which will come into contact with the support with other means providing protrusions thereon. It could for example be scored, scratched or striated, milled or knurled.

For fixing or applying either one of the illustrated and described relief elements **1** to the support **2** according to the invention it is placed with its surface provided with the protrusions **3** against the support **2** as shown in FIG. 1 whereafter an ultrasonic wave source is applied to the element and simultaneously the support is pressed against the element by means of an inert mass, shown in FIG. 7. There is produced thereby a molecular burst which intimately assembles the support **2** and the element **1** in a fixing which is similar to that obtained by the conventional resistance welding but which is free from the drawbacks inherent in the latter as mentioned above.

It is evident that the above described method can also be used to secure the fastening members, for example pins to the watch dial for fastening the latter to the plate or to parts of the casing of a watch. In the latter case it is the terminal or end face of the usually cylindrical pins which shall be secured to the dial plate which forms the support which is provided with protrusions and preferably these are formed by a circular peripheral rib **3** as shown in FIGS. 5*a* and 5*b* or even by several concentrical circular ribs **3** as shown by FIGS. 6*a* and 6*b*.

We claim:

1. A method of fixing a small metal symbol to a lacquer enamel coated watch dial plate, comprising the steps of placing the metal symbol over the coating on the watch dial plate, placing an inert mass against the back of the watch dial plate, pressing the symbol against the watch dial plate and vibrating the symbol on the watch dial at an ultrasonic frequency to firmly secure it to the dial plate through the lacquer enamel coating.

2. A method as claimed in claim 1 in which said relief figures are provided with protrusions on one side thereof, and said one side is placed against the watch dial plate.

3. A method as claimed in claim 1 in which the protrusions are provided by striating the said one side of the metallic relief figure.

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