Aug. 3, 1965 A. VOGT 3,197,846

PROCESS FOR MANUFACTURING A WATCH-DIAL WITH HOUR-SIGNS APPLIED IN RELIEF

Filed Jan. 29, 1959

FIG. 1

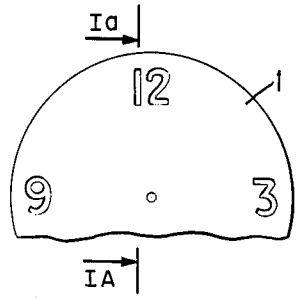


FIG. 1a

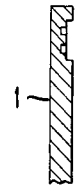


FIG. 2

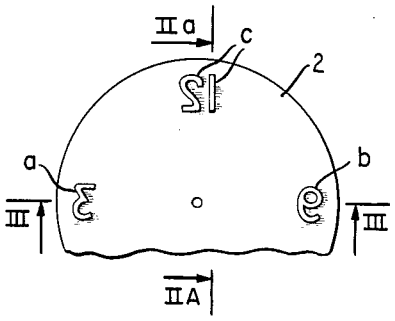


FIG. 2a

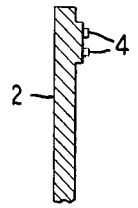
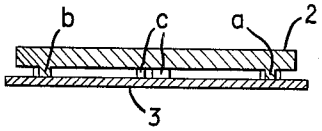


FIG. 3



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PROCESS FOR MANUFACTURING A WATCH-DIAL WITH HOUR-SIGNS APPLIED IN RELIEF

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9 Claims. (Cl. 29—177)

Dials with the hour-numerals applied in relief are generally prepared by affixing the numerals or other indicia one by one to the blank from which the dial is to be made. For this procedure each indicium requires a separate tool of its own shape. The indicium is glued, welded or screwed to the blank, or fixed to it by legs attached to the indicium itself. Making these numerals and affixing them one by one is costly, both because of the time it takes and because of the tools required. Another known procedure is to prepare the hour-numerals in one piece, for example by cutting them out from a sheet of the chosen material in such a way that they are all joined together by a thin filament and can then be placed in position in a one-stage operation. This process is less costly than the first, but the numerals cannot be separated from each other, i.e. the filament joining them remains. The aim of the present invention is to eliminate these disadvantages. It consists in a process for manufacturing a watch-face with the hour-indicia applied in relief, the essentials of the method being as follows: An instrument bearing the hour-indicia in intaglio, and in the shape and arrangement which they will have on the finished dial, is used to prepare a casting consisting of a blank with the hour-indicia in relief, but in the inverse of their normal shape and arrangement. The surface of this cast bearing the indicia in relief is applied to the blank from which the dial is to be made. The indicia are affixed to this blank and the blank removed from the cast by mechanical means, so as to separate the indica from each other.

The drawing shows, by way of example, one way of carrying out the process forming the object of this invention.

FIGURES 1 and 1*a* show respectively the striking face and a cross-section of a die or stamp, or the bottom of a mould, used for making the casting.

FIGURES 2 and 2*a* show respectively the face and a cross-section of the casting produced by the instrument illustrated in FIGURE 1.

FIGURE 3 illustrates one stage of the procedure.

The instrument shown in FIG. 1 may be a die or stamp whose striking face **1** bears all the hour-indicia in intaglio, shaped and arranged, and therefore legible, as they will eventually be on the finished dial. This stamp is used to stamp the casting **2**, consisting of a sheet of the metal of which the indicia are to be made. The resultant casting is as shown in FIGURE 2, in which it is seen that the indicia are inverted. Alternatively, the instrument of FIGURE 1 may be one of the elements bottom of a mould into which one pours or injects the constituent substance of the casting, which will again appear as in FIGURE 2.

The casting obtained by either of these procedures constitutes a holding tool which presents a surface 2 on which the hour-indicia which may be markers of conventional or unconventional character, though in the drawings these hour-indicia has been illustrated by the numerals 3, 9 and **12** (the intermediate numerals having been omitted), and the numerals 3, 9 and 12 being identified by the reference characters *a*, *b* and *c*. These hour-markers as shown in FIG. 2*a* stand out in relief. If necessary, the facing of the numerals is flattened by, for example, grinding. The side of the casting with the indicia in relief is

then applied to the upper surface of a blank **3**, which is to compose the watch-face and which is already in its final finished state or requiring only the finishing touches. The hour-indicia numerals are affixed to this blank (they may, for example, be glued on or welded on) and the combination **2**, 3 is then machined by lathe, grinding wheel or a mechanical cutter to remove the constituent material of the casting 2. This done, there remains the blank **3**, with the hour-indicia numerals attached in the desired shape and arrangement. The machined surfaces of the signs are polished and the dial finished off in the usual way.

To facilitate electric resistance welding and to prevent melted metal from spurting around the base of the numerals, which would spoil the appearance of the dial, a small welding projection could be made at the base of each indicia as indicated at 4 in FIGURE 2*a*. This projection could be made by means of a corresponding hollow in each of the numerals on the instrument as illustrated in FIGURE 1*a*. If the contact faces of each projection have an even surface and if the intensity of the current, the pressure and time taken for welding are properly chosen, the projections can be fused in such a way that the melted metal will not overflow the base of the indicia.

In addition to the hour-indicia, decorative motifs in relief could also be placed on the dial at the same time, simply by imparting their imprint in intaglio to the instrument used for making the casting.

The method constituting the object of the present invention further permits the manufacture of dials with hour-indicia applied in plastic material, it being possible to stamp or mould the casting in such material.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state, making a holding tool comprising a holding portion having a plurality of integral mirror-image indicia in relief thereon to be secured to said dial face, positioning said holding tool on said major surface of said dial with said indicia in contact with said major surface, bonding said indicia to said major surface while maintaining said substanially finished state of all exposed portions of said major surface of the dial, and mechanically removing said holding portion from said indicia thereby to leave only said indicia bonded to said dial major surface.

2. A method according to claim **1** in which said indicia are bonded to said major surface by gluing.

3. A method according to claim **1** in which said indicia are bonded to said major surface by welding.

4. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state, casting a holding tool comprising a plate having at least one integral mirror-image indicium in relief thereon to be secured to said dial face, positioning said holding tool on said major surface of said dial with said indicium in contact with said major surface, securing said indicium to said major surface while confining the weld to the area of said surface covered by said indicium and maintaining said substantially finished state of all exposed portions of said major surface of the dial, and mechanically removing said plate from said indicium thereby to leave only said indicium welded to said dial major surface.

5. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state, stamping a holding tool comprising a plate having at least one integral mirror-image indicium in relief thereon to be secured to said dial face, positioning said holding tool on said major surface of said dial with said indicium in contact with said major surface, welding said indicium to said major surface while confining the weld to the area of said surface covered by said indicium and maintaining said substantially finished state of all exposed portions of said major surface of the dial, and mechanically removing said plate from said indicium thereby to leave only said indicium secured to said dial major surface.

6. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state, making a holding tool comprising a plate making at least one integral mirror-image indicium in relief thereon and having a protrustion extending from and of lesser area than the base of said indicium adapted to be secured to said dial face, positioning said holding tool on said major surface of said dial with said protrusion in contact with said major surface, welding said protrusion to said major surface while confining the weld to the area of said surface covered by said indicium and maintaining said substantially finished state of all exposed portions of said major surface of the dial, and mechanically removing said plate from said indicium thereby to leave only said indicium secured to said dial major surface.

7. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said surface to a substantially finished state, making a holding tool comprising a plate having a plurality integral, angularly spaced mirror-image indicia in relief thereon and each indicia having a protrusion extending from and of lesser area than the base thereof adapted to be secured to said dial face, positioning said holding tool on said major surface of said dial with said protrusions in contact with said major surface, welding said protrusions to said major surface whereby said protrusions prevent overflow of metal beyond the base of the associated indicia, and mechanically removing said plate from said indicia thereby to leave only said indicia secured to said dial major surface.

8. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial of a relatively thin material and having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state,

making a holding tool of a material different than said dial and having at least one integral mirror-image, indicium in relief thereon to be secured to said dial face, positioning said holding tool on said major surface of said dial with said indicium in contact with said major surface in and extending inwardly from the outer periphery of said dial in a fixed position, welding said indicium to said major surface in said fixed position while confining the weld to the area of said surface covered by said indicium and maintaining said substantially finished state of all exposed portions of said major surface of the dial, and mechanically removing said tool from said indicium thereby to leave only said indicium secured to said dial major surface in relief.

9. A method of manufacturing a small watch dial having indicia in relief on the face of the dial comprising, providing a dial having a major surface corresponding to the face of the dial, finishing said major surface to substantially finished state, making a holding tool of a material different than said dial and having a plurality of integral mirror-image indicia in relief thereon in fixed positions and to be secured to said dial face, positioning said holding tool on said major surface in fixed relative positions representative of hourly indications on said dial, welding said indicia to said major surface in said positions while confining the welds to the areas of said surface covered by said indicium and maintaining said substantially finished state of all exposed portions of said major surface of the dial, and mechanically removing said tool from said indicia thereby to leave only said indicia welded to said dial major surface in relief.

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