Method of Making Bezel Ring with Lugs

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

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METHOD OF MAKING BEZEL RING WITH LUGS

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The present invention relates to a novel method of the manufacture of bezel rings or the like having projecting lugs thereon.

Watch cases generally comprise a bezel ring into which the watch movement and the watch crystal are received. Particularly in the case of wrist watches, these bezel rings are provided with lugs which permit the attachment of the watch to other devices, such as bracelets or bands. The shape and design of the lugs plays a large, and in many instances a predominating part in the styling of the watch. Since watches must be sold in a variety of styles and sizes in order to appeal to all segments of the purchasing public, the manufacture of the lugged bezel rings presents an appreciable problem.

A special problem is presented in the case of waterproof watches. There the dimensions of the bezel ring, and particularly its internal dimensions, are quite critical, and must be held to very close tolerances in order that the necessary tight fit be achieved between the bezel ring and the sealing parts inserted therein.

In general, two methods have been employed in the past for the manufacture of these lugged bezel rings. According to one method blanks of suitable size and shape are obtained, usually from sheet material, and those blanks are then machined to desired size and shape. Each blank must be individually handled and each machining operation, and particularly those relating to the interior of the bezel ring, must be performed to a very high degree of accuracy. The amount of machining required is appreciable, considerable time is involved, much difficulty is experienced in obtaining the desired smooth finish on the exterior surfaces, and the number of rejects experienced in quantity production is relatively high where close dimensional tolerances are involved. Dies must be provided for forming the blanks, separate dies must be used for each size and style and considerable wastage of material is involved.

According to another method the bezel ring and lug are extruded in the form of a tube having the desired shape, after which individual elements are sliced from the tube and machined as appropriate. Dies capable of use in such an extrusion process are exceptionally expensive and have a relatively short life. Individual dies are required for each size in a given design and for each different design. Accordingly it will be appreciated that the extrusion method is economically practical only when a very large number of bezel rings of the same size and shape are to be produced. A further drawback is that the extruded material is not uniformly "worked" over the entire periphery of the lugged ring so that it is not of uniform hardness throughout. A very significant machining problem thus arises, and tools tend to break during machining operations. In addition, it is quite difficult to keep the dimensions of the extruded tube within accurate dimensional tolerances.

In both of these known methods of manufacture the ring and the lugs are initially formed in a single body.

I have found that it is possible to make lugged bezel rings indistinguishable as to appearance and quality from those manufactured according to prior methods by using preformed tubes of appropriate size and shape. These tubes are available on the market as stock items, and adding lug-forming material to those tubes, as by welding preformed metal strips thereto or building up the lugs with welding material along the length of the tubes. The thus applied lug-forming material is subsequently machined to desired shape and individual lugged rings are sliced from the tube.

This method has many advantages when compared with the prior art methods. No dies at all are required, and hence the method is exceptionally well adapted for the manufacture of limited numbers of a given style or size. The components may be standard stock items. Changes in style, which primarily involve changes in the size and shape of the lugs, may be accomplished through the use of different lug strips, while the same tube material may be used for many different styles. There is practically no wastage of material. The maintenance of accurate dimensions is greatly facilitated. The amount of machining involved is much less than in either of the prior art methods. Speed of manufacture is greatly increased. The rings, prior to machining, are of uniform hardness, thus further facilitating the machining operation. Each one of these factors involves an appreciable saving in cost of manufacture, and all of them considered together indicate that the method of the present invention is markedly superior to the prior art methods.

To the accomplishment of the above, and to such other objects as may hereinafter appear, the present invention relates to the method of manufacturing a lugged bezel ring as defined in the appended claims and as described in this specification, taken together with the accompanying drawings, in which:

FIG. 1 is a three-quarter perspective exploded view of the stock components which may be used in the practice of the present invention, those components comprising a tubular element and a series of lug-forming strip elements;

FIG. 2 is a view similar to FIG. 1 but showing the strip elements welded into place along the tube;

FIG. 3 is a view similar to FIG. 2 but showing the attached tube and lugs after machining;

FIG. 4 is a three-quarter perspective view of a lugged bezel ring formed from the assembly of FIG. 3, and with a crystal in place thereon; and

FIG. 5 is a three-quarter perspective view of an embryonic lugged bezel ring cut from the assembly of FIG. 2.

My invention is here specifically disclosed as applied to the manufacture of a bezel ring for a man's wrist watch, such a ring having four lugs thereon, two at each end, so that it may be attached to a watch band or bracelet. This is purely by way of exemplification, and it will be apparent that the method is applicable to the manufacture of lugged bezel rings of many other sizes, styles and shapes. The method is further specifically disclosed in conjunction with the formation of a bezel ring of stainless steel, since the shaping and machining problems connected with the use of such material is most troublesome, but the method is applicable to other types of material as well.

The first element involved in the practice of the method is a tube 2 of appropriate material, such as free machining 8-12 stainless steel. It is immaterial whether the tube is seamless or welded. Such tubes may be obtained from suppliers with high uniform dimensions, particularly as to the inside diameter thereof.

The next step is to apply to the tubes 2, at appropriate locations on their periphery corresponding to the desired locations of the lugs, masses of material extending along the length of the tubes, from which masses the lugs are ultimately to be formed. These masses may be produced directly by building up mounds of material along the length of the tube 2 in a well-known manner available on the market as stock items, and adding lug-forming material to those tubes, as by welding preformed strips 4 of stainless steel or the like which are oriented lengthwise of the tube 2 and
are secured thereto by welding, the built-up weldments 6 on either side thereof serving to provide the material for creating the smooth transitional lines between the lugs and the ring 2a in the finished object. The welding operation is particularly well adapted to be accomplished by existing automatic welding machinery. The strips 4 are located relative to the ring 2 by means of an appropriate jig or fixture, and the welding heads are rolled along the length of the tube 2. Welding at the rate of sixty feet per hour, two welds a time, is readily attainable with existing equipment. The resultant assembly is shown in FIG. 2.

The assembly of FIG. 2, in appropriate lengths, is then machined, in any appropriate type of machine, to desired shape and size. The assembly of FIG. 2, it will be appreciated, includes a large number of embryonic bezel rings rigidly secured to one another. Hence a single pass of the assembly of FIG. 2 through the machining operation will not only result in the machining of a large number of bezel rings, the actual number depending upon the length of the assembly, but will also ensure that each and every one of those rings, when they are ultimately formed, will have the same dimensions. The manner in which the machining changes the relatively crude assembly of FIG. 2 into an assembly having a finished appearance will be apparent from a comparison of FIG. 2 and 3, the latter figure illustrating the assembly of FIG. 2 after it has been exteriorly machined. This comparison will also show how the weldment areas 6 have been used, in conjunction with the rectangular stock strips 4, to produce an attractive and smooth external configuration.

Next the assembly of FIG. 3 may be placed in an automatic machine which may perform certain finishing operations and which will then slice off elements from the assembly (along the broken lines 8 of FIG. 3) into substantially finished lugged bezel rings. While certain machining operations may still have to be performed on the individual rings as thus produced, these will be minimal in scope and will not detract from the fact that the important dimensions of all of the rings will be identical.

In those instances where the bezel ring is to be internally threaded in order to receive the back of the watch, that threading operation (together with any finishing of the internal dimensions of the ring) may be accomplished through the exposed end of the tube 2 just prior to the severing of the ring from the tube along the line 8. Thus a single setup of the machine will ensure identical machining operations for each ring formed from the elongated tube.

Alternatively, embryonic bezel ring elements may be sliced from the assembly of FIG. 2, one of such embryonic elements being illustrated in FIG. 5, after which machining operations are performed upon it. Since this involves a greater degree of machining on individually handled elements than in the sequence previously described, it is somewhat less advantageous.

The final ring, shown in FIG. 4, comprises a ring portion 2a corresponding to the tube 2 and lugs 4a corresponding to the strips 4 and the weldment areas 6.

The method of the present invention permits the production of lugged bezel rings at an appreciably greater rate than has heretofore been thought possible, represents a marked saving in material, and permits up to 60% improvement in the maintaining of appropriate dimensions important in waterproof watch cases. To change the style or design of the lugs it is only necessary to change the shape of the lugs or shape of the lugs attached to the exterior of the tube 2. This may be done either by appropriate movement or shaping of the welding head or by the use of strips 4 of different size or shape, or both. It is significant that no dies whatsoever are required.

The fact that no dies are used presents a subsidiary advantage in that it is much easier to obtain a smooth surface on the periphery of the ring 2a between the lugs 4a than to secure a smooth external finish which is not marred by any of the assembly operations.

The speed of welding and the quality of the produced product may be improved by circulating cooling water through the tube 2 during the welding operation.

The tube 2 is illustrated as having a circular cross section, but it will be appreciated that it could have any desired shape consistent with the shape of the watch case with which it is to be used. Moreover, it will be appreciated that the element 2 need not be tubular at the time that the strips 4 are secured thereto. For example, a solid rod of material could be employed, the interior of which could be bored out throughout its length before the individual lugged bezel rings are sliced off therefrom.

While but a single embodiment of the present invention has been here specifically disclosed and illustrated, it will be apparent that many variations may be made therein, all within the scope of the instant invention as defined in the following claims.

I claim:

1. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated body having a cross sectional shape and size rough that of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of elongated masses of a size and shape roughly that of the desired lugs, followed by (b) cutting said structure transversely into individual elements of thickness corresponding to that of the desired bezel ring and machining said elements to desired shape.

2. The method of claim 1, in which said machining step is at least substantially performed before said cutting step.

3. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated tubular body roughly of the size of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of preformed elongated strips of a size and shape roughly that of the desired lugs, followed by (b) cutting said structure transversely into individual elements of a thickness corresponding to that of the desired bezel ring and machining said elements to desired shape.

4. The method of claim 3, in which said machining step is at least substantially performed before said cutting step.

5. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated tubular body roughly of the size of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of preformed elongated strips of a size and shape roughly that of the desired lugs, followed by (b) cutting said structure transversely into individual elements of thickness corresponding to that of the desired bezel ring and machining said elements to desired shape.

6. The method of claim 5, in which said machining step is at least substantially performed before said cutting step.

7. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated tubular body roughly of the size of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of preformed elongated strips of a size and shape roughly that of the desired lugs, followed by (b) cutting said structure transversely into individual elements of thickness corresponding to that of the desired bezel ring and machining said elements to desired shape.

8. The method of claim 7, in which said machining step is at least substantially performed before said cutting step.
9. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated body having a cross sectional size and shape roughly that of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of preformed elongated strips of a size and shape roughly that of the desired lugs and building up the structure with welding material to more closely approximate the shape of the desired lugs, following by (b) cutting said structure transversely into individual elements of a thickness corresponding to that of the desired bezel ring and machining said element to desired shape.

10. The method of claim 9, in which said machining step is at least substantially performed before said cutting step.

11. The method of forming a bezel ring with lugs which comprises (a) the welding lengthwise to an elongated tubular body roughly of the size of the desired bezel ring, at locations on the periphery thereof corresponding to the location of the desired lugs, of preformed elongated strips of a size and shape roughly that of the desired lugs and building up the structure with welding material to more closely approximate the shape of the desired lugs, followed by (b) cutting said structure transversely into individual elements of a thickness corresponding to that of the desired bezel ring and machining said element to desired shape.

12. The method of claim 11, in which said machining step is at least substantially performed before said cutting step.

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