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E. MORF  
MANUFACTURING PROCESS OF WATCH GLASSES  
MADE OF TRANSPARENT ELASTIC MATERIAL  
Filed April 9, 1931

1.877,358

Fig. 1.

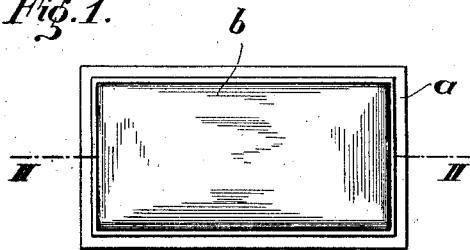


Fig. 2.

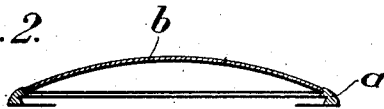


Fig. 3.

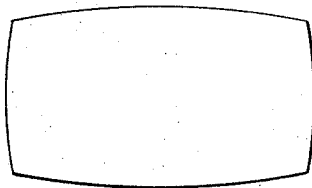


Fig. 4.

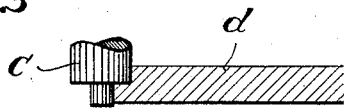
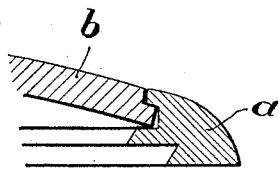


Fig. 5.



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## MANUFACTURING PROCESS OF WATCH GLASSES MADE OF TRANSPARENT ELASTIC MATERIAL

Application filed April 9, 1931, Serial No. 528,936, and in Switzerland October 29, 1930.

The present invention relates to a manufacturing process of watch glasses made of a transparent elastic material.

It has been proposed with a view of avoiding the breaking of watch glasses especially of wrist watches to make such glasses for instance of a derivative of cellulose which is not inflammable and more transparent than the celluloid.

It is necessary for securing such glasses safely to the bezel to camber the glasses, that is to insert the same with a slight outward bulging. The elasticity of the glass will press the rim into the border of the bezel.

In order to do this the glass was cut out heretofore in its approximate shape from a sheet of the chosen material and after having pressed it between two dies, one convex and the other concave, with a view of cambering the glass the rims were finished to shape by means of file and hammer so as to obtain the required chamfering for holding it in the bezel. This process is very tedious. The daily turn-out of a workman is very small and the cost of a glass accordingly considerable.

To improve this state of things the present invention consists in determining beforehand geometrically the outline of the flat evolution of the cambered glass, in cutting out a templet according to this outline preferably somewhat larger than natural size and in cutting out according to said outline by means of a recessed cutter the glass from the sheet of material, so that the glass after having been cambered will have exactly the required shape for fitting into the bezel without needing further help.

Thus the main feature of the present invention is a process according to which flat blanks of transparent elastic material of cambered glasses for rectangular bezels are so prepared that after the cambering of the same the so formed glasses will fit the bezel

everywhere all around without needing further help.

The annexed drawing represents as an example and diagrammatically—

in Fig. 1 a plan of a bezel provided with an unbreakable glass,

in Fig. 2 a sectional view on line II—II of the Fig. 1,

in Fig. 3 a plan view of the approximate form of the evolution of the glass shown in section in Fig. 2,

in Fig. 4 a view on a larger scale of the cutter used for working the rim and

in Fig. 5 a sectional view of part of the bezel with the glass inserted.

With reference to the drawing *a* designates a bezel whereof a part is shown in section in Fig. 5. This bezel carries a glass *b* made of transparent and elastic material, which is fitted into the bezel after having been cambered to such an extent that the elasticity of the glass will hold it in place everywhere all around in order to give to the cambered glass a rim fitting a rectangular bezel as shown in Fig. 1 it must be cut out in a flat state according to the outline shown in Fig. 3.

For each kind of bezels this outline can be determined beforehand geometrically so that it is possible to design a templet according to the required outline. This templet is mounted for instance on an engravers pantograph having as a tool a cutter *c* with a profile according to Fig. 4.

The said pantograph has a stop which limits exactly the path of the cutter in height. When the cutter is brought down to the sheet *d* and by following the outline of the templet a glass will be detached having a shoulder *e* which enters into the groove of the bezel as shown in Fig. 5.

By means of a press having two dies, one convex and the other concave the cut-out glass is cambered and at the same time brought into the bezel. The pressure of the

dies is now released so as to leave to the glass all liberty to enter by its elasticity into the grooves of the bezel where it will be firmly retained.

5 What I claim as new is:

In a manufacturing process of cambered watch glasses of transparent elastic material especially for rectangular and other fancy bezels the process of cutting out from  
10 a plate of said material and by means of a profiled cutter a plane pattern shaped according to geometrical calculation such that it fits in the predetermined cambered state exactly into the profiled bezel.

15 In testimony whereof I affix my signature.

ERNEST MORF.

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