Title (en)
METHOD FOR MANUFACTURING A SPRING LEAF OF A TIMEPIECE MEMBER AND SAID SPRING LEAF

Title (de)
VERFAHREN ZUR HERSTELLUNG EINES FEDERBLATTES EINES UHRENELEMENTS UND BESAGTES FEDERBLATT

Title (fr)
PROCEDE DE FABRICATION D'UNE LAME RESSORT D'UN ORGANE HORLOGER ET LADITE LAME RESSORT

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Application
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Abstract (en)
[origin: WO2022106433A1] The present invention relates to a method for manufacturing a spring leaf (4) of a timepiece member (1) pivoting about a swivel axis and subjected to a torque exerted by at least one spring leaf (4), said timepiece member (1) comprising at least one rotary mobile portion configured so as to be capable of pivoting about the swivel axis thereof, said spring leaf (4) being configured so as to work within a predetermined range of angular positions adopted by the end of the spring leaf (4) in association with the rotary mobile portion during an angular displacement of at least said end of the spring leaf (4), which method comprises the steps of: (a) determining objectives to be achieved by said spring leaf (4); (b) determining fixed parameters relating to the spring leaf (4); (c) determining variable parameters relating to the spring leaf (4); (d) providing a substrate made of a material from which the spring leaf (4) is produced so as to achieve the objectives predetermined in step (a) and the fixed and variable parameters predetermined in steps (b) and (c); (e) generating geometric shapes of the spring leaf (4), the geometric shape of the spring leaf (4) in the neutral state being a curve defined by the equation (1), (1) with u = (rmax – r)/(rmax – rmin ∈ [0.1], where rmin and rmax are the distances between the swivel axis of the timepiece member (1) and each of the ends of the spring leaf (4); B 1 and B 2 , which are variable parameters, are the angles between the ends of the spring leaf (4) and the attachment points thereof at rmax and rmin; n defining the total number of curvatures; Ak, which are variable parameters, are angular amplitudes, each spring leaf shape being generated by randomly selecting values for the variable parameters and for the coefficients Ak , B1 and B2 within the search ranges thereof; (f) numerically calculating, for each geometric shape of a spring leaf (4) generated in step (e), at least the torque, the stress and the space occupied by the deformed portion; (g) selecting, from the results of the calculations of step (f), the best permissible geometric shapes obtained in step (e) and optimising said permissible geometric shapes corresponding to the equation (1), so as to identify the variable parameters and Ak, B1 and B2 whereby the spring leaf shape (4) that best achieves the objectives predetermined in step (a) can be obtained, the optimisation parameters being selected from the variable parameters predetermined in step (c) and the coefficients Ak, B1 and B2; (h) forming at least one spring leaf (4) having the shape obtained in step (g) in said substrate.

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