ISSN:2348-2079

Volume-6 Issue-1

International Journal of Intellectual Advancements and Research in Engineering Computations

Inspection time reduction for watch strap hole checking

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Abstract :

Our project is about time reduction of watch case strap hole checking (or) spring bar hole checking.In watch case the inner wall and height checking takes more time. Due to lack of time for inspection itself makes the production down. So the production loss and profit loss will occurs. Normally the strap hole checking time takes 7mins,our aim is to reduce the checking time from 7to 2mins. If the checking time is reduced,the machine ideling time will be reduced.So the production and profit will be increased automatically. In previous checking type, it has more steps for checking the strap hole. For each time we have to set the origin value zero before checking the dimensions. Now we need not set the origin zero each time because the origin value is set at a standard value at a particular place as a reference point. So we need not set the origin for each dimensions.

Index words – Spring bar hole, Checking time .

I.INTRODUCTION

Watch case also called as the case center is manufactured out of brass or stainless steel. The outlook of the watch depends on the case center. Hence, the case center is unique for every model. Due to this, more varieties of case center need to be manufactured. Case center accounts for 30% of the total cost of a watch. Normally watch case are produced in larger amount in that 50% of product will be produced in the machine, remaining 50% of the machine will be in idle position because of more time utilized for inspection. Till now in industries they use separate instruments and locators for inspecting the watch case. Generally in watch case the inner wall and height inspection takes more time. For checking both dimension it will take 7 to 10 min, for each time we should set zero as a reference point.

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Different types of locators needed for difference types of watch case. The locators are all manufactured in the same industries, according to the needs.More space is required for separate instruments like locator and dial gauge. The watch case can be fixed into the locators by hand method, while fixing the watch case into the locator there may be misalignment occurs. For each time of inspection the locators are holded in one hand and

the dial gauge set up are done.For this lot of time is wasted, by eliminating this we can reduce the inspection time.

The watch product constitutes of four major sub assemblies. Table 1 list outs the sub assemblies and their essential components. Table 1 & Figure 1 give the pictorial representation of the watch assembly and individual components.

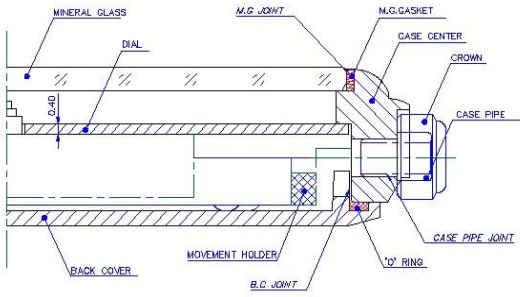


Fig. 1Cross Sectional View of Watch Assembly

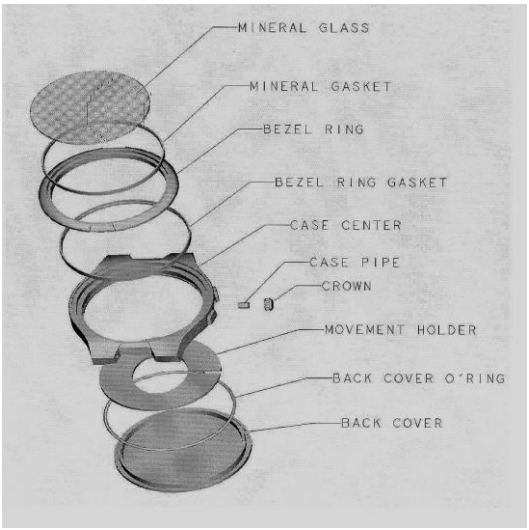


Fig. 2 Exploded View of Case Assembly

II.LITERATURE SURVEY

[1] A.Lazaro made a study on inspection with ultrasonic techniques for identifiying defects in foundry pieces.

[2] Yongjun zhang made a study by using non metric CCD Camera in automatic inspection of industrial sheetmetal parts.

[3] Dr. Josephine Lourdes de rose made a study on factors contributing to the selection of a wrist watch using conjoint analysis.

III.MATERIAL USAGE

The material used in our project are ceramic, aluminium, plastic, titanium, metallic. The profile has two types, the one is round shape and the other one is shaped profile. Based on the model the profile has been used. Titanium is corrosion resistant and serves many purpose because of its durability. The metal is commonly used in watches and bracelets. It changes colour as the metal temperature increases. A ceramic is an inorganic compound, non-metallic, solid material comprising metal, non-metal or metalloid atoms primarily held in ionic and covalent bonds. The crystallinity of ceramic materials ranges from highly oriented to semi-crystalline, vitrified, and often completely amorphous (e.g., glasses).Aluminium alloys (or aluminium alloys; see spelling differences) are alloys in which aluminium (Al) is the predominant metal. The typical alloying elements are copper, magnesium, manganese, silicon, tin and zinc. About 85% of aluminium is used for wrought products, for example rolled plate, foils and extrusions Generic term used in the case of polymeric material that may contain other substances to improve performance or reduce costs. Plastic is material consisting of any of a wide range of synthetic or semi-synthetic organic compounds that are malleable and so can be moulded into solid objects. Different types of lug configuration has been used like single lug, multi lug, open lug, concealed lug.

The Marketing department provides the watch demand to the central planning. The central planning in turn provides the requirements of individual components to the respective production planning control department. Based on the input for central planning the PPC workouts the requirement from the manufacturing shops and provides the required raw materials.

The case center is the major component in watch assembly. Hence, it is essential to understand the existing manufacturing process. The following section provides details on the in-house manufacturing process.

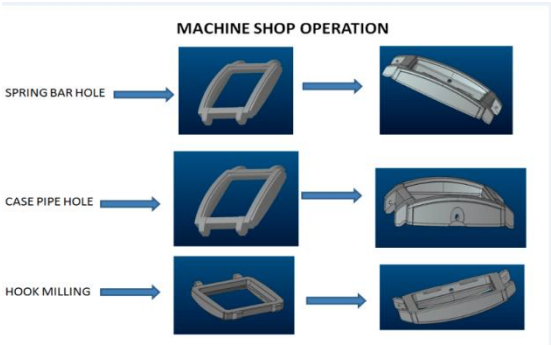


Fig. 3 Operations In Watch Case

IV . SPRING BAR HOLE

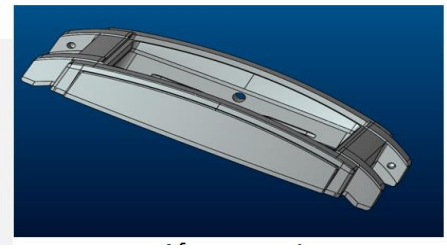
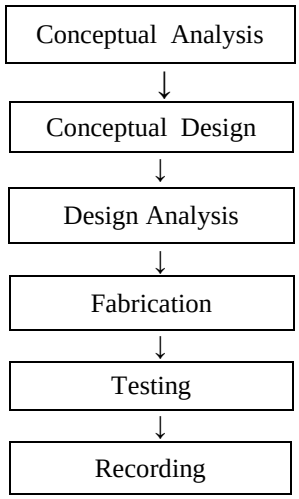


Fig. 4Spring Bar Hole

The hole for spring bar assembly is drilled in case center by special purpose machine. The spring bar assembly retains the strap with the case.

V. DESIGN PROCESS



VI. EXPERIMENTAL SETUP

An experimental set up is established as shown in figure. The experimental set up consists of main components like spring, bolt and nut, dual dial gauge, L-filler pin, steel plates, dial stand, mechanical stopper, spring return mechanism etc.

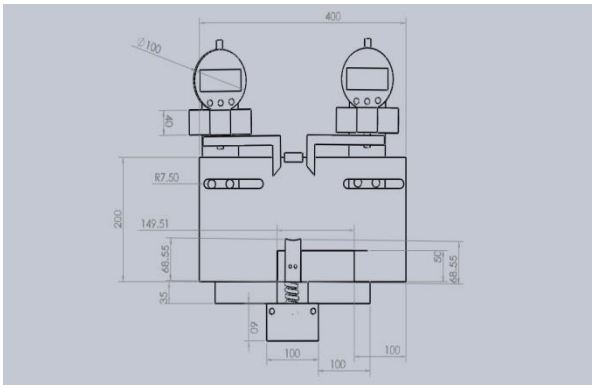


Fig. 5 2D View of Conceptual Design

Plate has been defined as a metal sheet with a thickness of .2300" or more; sheet is defined as metal that is thicker than foil and less than .2300". Due to its higher thickness, carbon steel plate is used for products that require durability and strength but do not require the lower weight of a thinner metal sheet.Indicators may be used to check the variation in tolerance duringthe inspection process of a machined part, measure the deflection of a beam or ring under laboratory conditions, as well as many other situations where a small measurement needs to be registered or indicated. Dial indicators typically measure ranges from 0.25 mm to 300 mm (0.015in to 12.0in), with graduations of 0.001 mm to 0.01 mm (metric) or 0.00005in to 0.001in

VII. WORKING PRINCIPLEOF CONCEPTUAL DESIGN

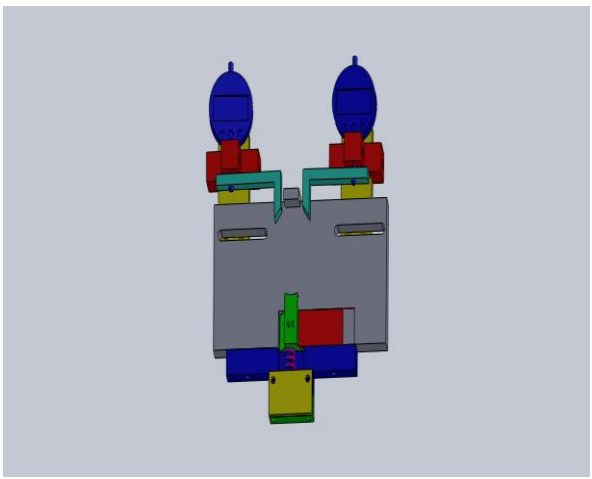


Fig. 6 3D Conceptual Design

The spring bar hole and height can be checked easily than previous inspection method. In this method the origin value is made fixed at a point, so the reference setting time is reduced completely. Different locator are used to fix the watch case for measuring the dimensions, its usage is removed by placing the watch case over the fixed plate. Due to reducing the inspection checking time the production rate can be increased in larger values.

VIII. TIME CALCULATION

Table 1: Time reduction values

Content	Before Inspection	After Inspection
Inner wall Timing	3min50sec	2min
Height timing	3min	1min50sec
Total timing	6min50sec	3min50sec

The time is reduced from 6min50sec to 3min50sec from this method. Due to reduce in checking time the machine ideling time can be reduced, so production can be increased.

IX. RESULT AND DISCUSSION

There are many inspection instrumentused in different industrial areas for different product inspection in their related fields. Advanced inspection tools may cost high and occupy more space. Small production units cannot use high tech instruments for inspection itself. Our method of checking will not cost high and simple to use and handle it. The method is only suitable for inspecting watch related product in watch manufacturing industries. In future it can be automated for measuring the dimension in watch case, if automated the time of inspection can be reduced further or completely. The time is the major drawback in every industries for production of their product without defect on time.

REFERENCES

1. Anita N . Halamata – An empirical study with reference to Haveri District, Karnataka, IOSR Journal of Business and Management (IOSR-JBM) ISSN: 2278-487X. Volume 7, Issue 1 PP 01-07, Jan. - Feb. 2013.

2. Bieber, G., Kirste, T., & Urban, B. (2012). Ambient Interaction by Smart Watches. In Proceedings of the 5th International Conference on Pervasive Technologies Related to Assistive Environments (pp. 39:1–39:6). New York, NY, USA: ACM.

3. Funk, M., Sahami, A., Henze, N., & Schmidt, A. (2014). Using a Touch-sensitive Wristband for Text Entry on Smart Watches. In CHI ’14 Extended Abstracts on Human Factors in Computing Systems (pp. 2305–2310). New York, NY, USA: ACM.

4. Rao, venkoba, A Case of Indian Wristwatch Market, South Asian Journal of Management; Vol. 15 Issue 2, p100, Apr-Jun2008.

5. Wilson, A M, "Understanding organisational culture and the implications for corporate marketing," European Journal of Marketing, Vol.35, pp 353-67, 2004.