OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

AUTO INSPECTION OF THREADS

Sanjay Gadkari [1], Rajendra L Gaike[2], Pavan D. Shelke [3]

Assistant Professor, Department of Electronics and Telecommunication, MIT Aurangabad [1]

Assistant Professor, Department of Electronics and Telecommunication, MIT Aurangabad [2]

Third year student, Department of Electronics and Telecommunication, MIT Aurangabad [3]

sygadkari@gmail.com [1],rajendragaike@rediffmail.com [2], technicalfunwithpavan@gmail.com [3]

Abstract: **The project "Auto Inspection of Threads" is based on detection and separation of defective jobs. The inspection of parts DU47, 03(M6) & M8 which are being welded on platina shokers, break sharing top assembly & cowling break is done manually. In the manual inspection inner threads and the threads are present or not detection is done by manually. It is a sample based technique in which only 12 to 15 jobs are taken randomly for inspection out of 1000 jobs. At least every day 6 to 10 jobs founds faulty. In this process it's required more man power, also it will takes a lot of time and inspection of all 1000 jobs are not possible. If by chance any faulty job welded on platina shokers , break sharing top assembly & cowling break the whole assembly is not of use and because of that the vender company charge a fine about Rs.1000 to Rs.1500 ,disturb the relations and also effects on reputation of company. So to overcome all of this the jobs are scanned by a camera and the output of the camera signal is given to the processor or computer to process weather the job is defective or not, for the processing image processing technique is used ,using MATLAB software. If job is defective the processor will send a signal to the sorting mechanism to separate the defective, jobs.**

Keywords: Automatic system, Inspection system, inspection of threads in very low time

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I INTRODUCTION

Basically the solution is being provided to the "Sheet Shapers PVT. LTD. Waluj, Aurangabad". This company manufactures platina shokers; break sharing top assembly & cowling break for platina and discover motorcycle of Bajaj. The inspection of parts DU47, 03(M6) & M8 which are being welded on platina shockers, break sharing top assembly & cowling break is done manually. In the manual inspection inner threads and the threads are present or not is done by manually. It is a sample based technique in which only 12 to 15 jobs are taken randomly for inspection out of 1000 jobs. At least every day 6 to 10 jobs founds faulty. In this process its required more man power, also it will takes a lot of time and inspection of all 1000 jobs are not possible. If by chance any faulty job welded on platina shockers, break sharing top assembly & cowling break the whole assembly is not of use because of that the vender company charge a fine about Rs.1000 to Rs.1500, disturb the relations and also affects on reputation of company.

Figure 1 : Job M6

Figure 2: Job M8

So to overcome all these problems the Automatic inspection of threads solution is being provided to the industry. In this solution/project the jobs are scanned by a camera and the output of the camera signal is given to the processor or computer to process weather the job is defective or not, for the processing image processing technique is used, using MATLAB software. If Job is defective the processor

will send a signal to the sorting mechanism to separate the defective jobs.

As image processing technique is used to detect faulty jobs, it reduces the man power and also increases speed of inspection. It can inspect all 1000 jobs which is present in a bin which is a raw material for this Industry.

II STUDEY AREAS

The inspection of threads using laser beam, using DC motor, using manual inspection is already done but main task is threads detection with higher speed , in which as maximum as possible jobs are to be inspected at a time and using image processing it is possible. Image processing can be using Python image processing or using MATLAB software it is possible , and we can also create GUI(Graphical User Interface) by which we don't need to use license MATLAB software. The main study area for inspection is to adjust the angle of camera at which the all threads will be visible and can get proper real time image of threads, Light beams are passed from bottom of the job by which threads are clearly detects and on the top of job camera inspects threads. Study area for inspection is image acquisition, processing on that image and handles the output according to the Input.

III PROBLEM STATEMENT

[1].To reduce the human errors and also to reduce thecost of inner thread inspection the company wants to make a system which will completely automatic and which will gives the proper output with low time, low Price and in less human power.[2]. "Sheet Shapers pvt. Ltd. Waluj , Aurangabad" company manufactures platina shokers,break sharing top assembly & cowling break for platina and discover motorcycle of bajaj.

The inspection of parts DU47, 03(M6) & M8 which are being welded on platina shokers, break sharing top assembly & cowling break is done manually. In the manual inspection inner threads and the threads are present or not is done by manually. It is a sample based technique in which only 12 to 15 jobs are taken randomly for inspection out of 1000 jobs. At least every day 6 to 10 jobs founds faulty. In this process it's required more man power, also it will takes a lot of time and inspection of all 1000 jobs are not possible. If by chance any faulty job welded on platina shockers, break sharing top assembly & cowling break the whole Assembly is not of use because of that the vender company charge a fine about Rs.1000 to Rs.1500, disturb the relations and also effects on reputation of company.

i) The Company does not have any automated setup for internal inspection of threads

ii) Human errors are more

iii) Cost incurred is more

iv) Time consumption is more.

IV APPROACH AND METHODOLOGY

Initially, the plant layout and production schedule was studied. The basic requirement for the inspection system is the Sorting mechanism, Image processing setup and last tilting mechanism for separation defective and non-defective jobs. Following hardware and software parts require for the auto inspection of threads system

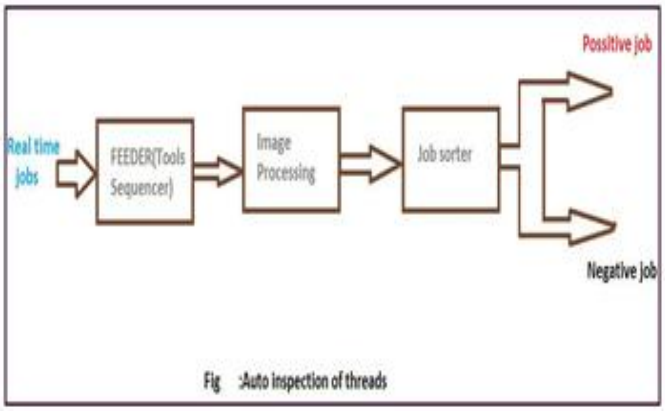

Figure 3: Auto Inspection of threads

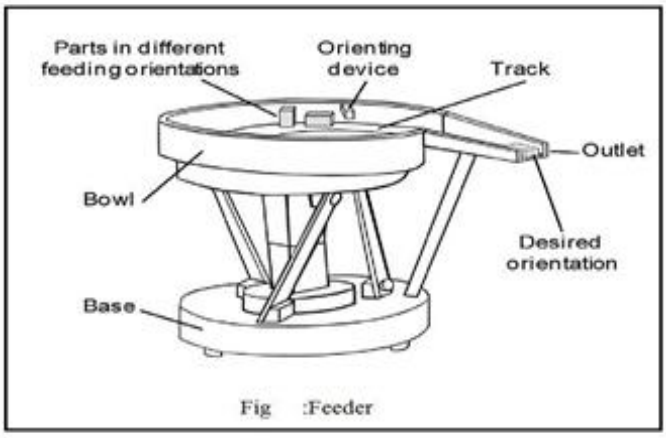

Figure 4: Feeder

1. Feeder:

Feeder is used for arranging the real time tools (jobs) in sequential manner. The tools are randomly given to the feeder and feeder arranges them sequentially and pass them using vibrator.

2.Image Processing Setup:

Real time image is captured by cameras with constant time intervals and then using MATLAB GUI all image processing is done. In Image processing actual image is already stored in processor and other image is real time image, here applies edge detection filter to both the images and then compares both the images and according to mean of difference between these two images output signal is given to actuator (sorter).

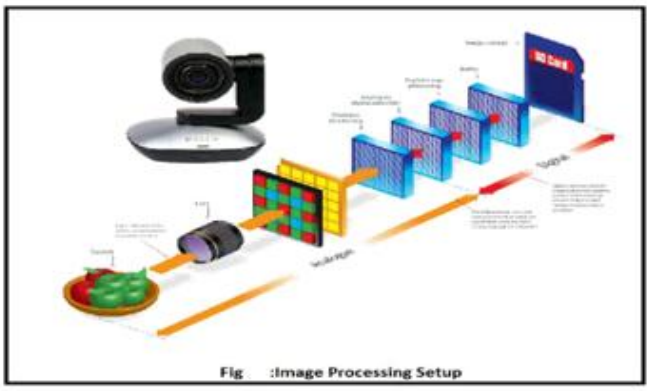

Figure 5: Image Processing Setup

3. Job sorter:

According to the output signal given by the processor sorting machine separates the defective jobs and non-defective jobs. RS232 is used for serial communication between job sorter and actual processor.

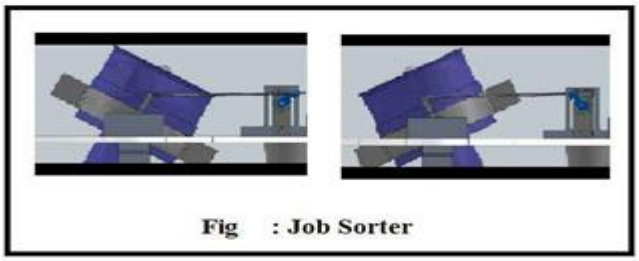

Figure 6: Job Sorter

4. Output:

The image which is stored in processor is converted into RGB to Gray and then apply canny edge detection to this image as shown in in Fig (a) and Fig (b) as reference image at a time real time Image is scanned by camera and this real time image is convert in gray Image and then apply canny edge detection to this image and then compare this real processed real time image with reference filtered image by which we got difference between them. MATLAB always works with matrix so getting mean value differenced image we can decide either real time job is defective or non defective. If the difference image of that comparison is as shown in Fig (a) then real time job is non-defective, but if the difference image of that comparison is as shown in Fig (b) then the real time job is defective & this job is separated by sending the signal to sorting mechanism.

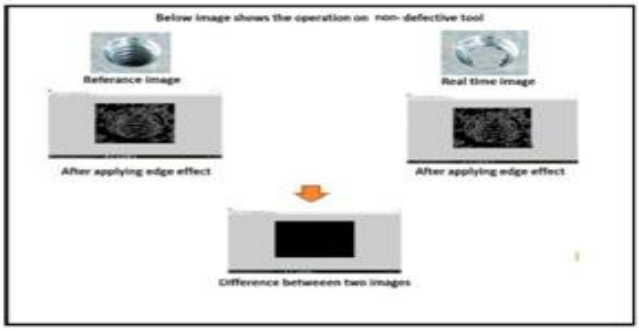

Figure 7 (a): Image for non-defective tools

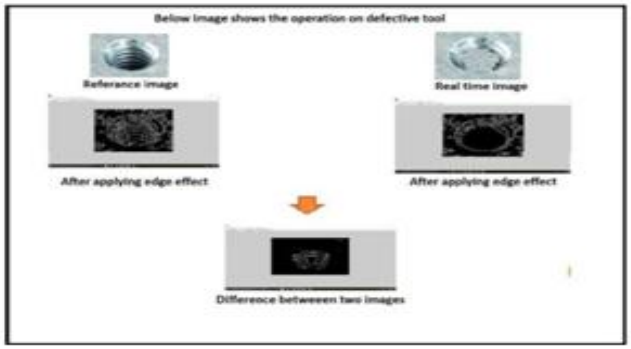

Figure 7 (b): Images for defective tools

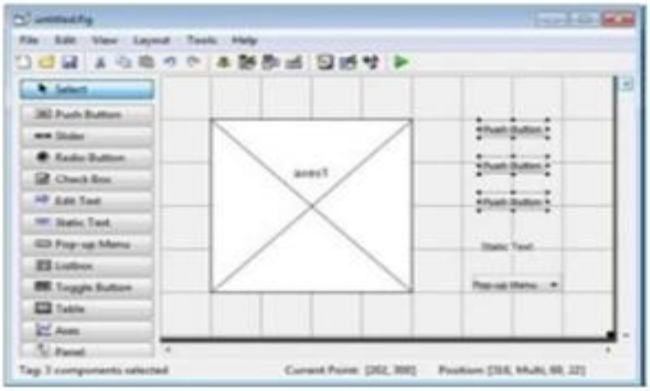

Figure 7 (c): GUI Visualization

Manual inspection of thread takes very much time and if manual inspection replaced with auto inspection then it will takes very less time. The speed of inspection increases with 10 times of the manual inspection. Following graph shows the difference in speed of manual inspection and auto inspection

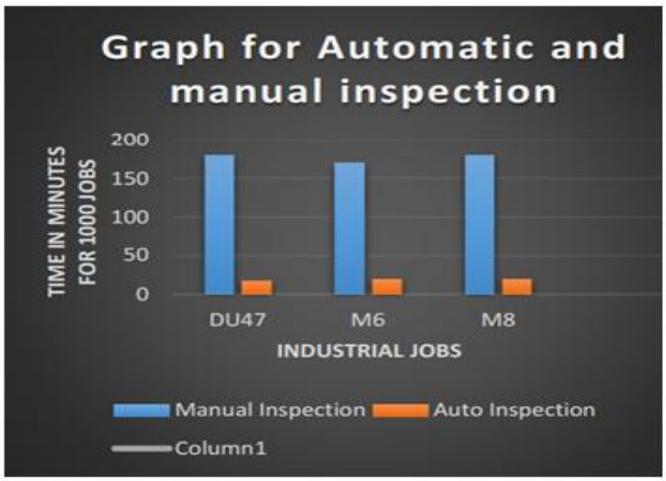

Figure 7 (d): Graph showing time required for manual inspection Vs auto inspection.

V CONCLUSION

Automatic inspections of threads are possible with many other techniques but using Image processing it increases the speed of inspection. Image is capture by camera and on that image further processing is happen so there is no physical contact in image processing setup and real time job

so it avoids any damage on job. Because of light passing from the bottom so this will avoids the fake cracks and also helps to capture clear image.

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BIOGRAPHY

Prof. Sanjay Gadkari, Currently working as Professor in Electronic Tele-communication Engineering Department, MIT (T), Aurangabad, Maharashtra,India

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Mr. Rajendra Laxmanrao Gaike Currently, working as Assistant Professor of Electronic Tele- communication Engineering Department in MIT (T) Aurangabad, Maharashtra, India

Mr. Pavan D. Shelke currently pursuing B.Tech (in Electronics & Tele-Communication Engineering) in MIT (T), Aurangabad, Maharashtra, India