

ANALYSIS AND DESIGN OF JOBS FOR CONTROL OF CUMULATIVE TRAUMA DISORDERS: PLASTIC FORKS/SPOONS PACKING JOB

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ABSTRACT

Cumulative trauma disorders caused by repetitive hand and arm movements were studied in this paper for a plastic forks/spoons packing job. The job was categorised into several work elements associated with the trunk, hand and arm motions. The number of motions were then counted for each eight-hour shift. It was found that the worker has to move the right hand 45,211 times and left hand 45,931 times for a working shift. In some of the motions, the worker has to twist the trunk. This relatively high number of motions is due to the current positioning of equipment and tools. With some considerations on the positioning and orientation such as distances and heights, the repetitive motions of the hands and arms can be significantly reduced, hence minimising the risk factors associated with cumulative trauma disorders.

Keywords : Cumulative Trauma Disorder, Ergonomic, Risk Factor

1. INTRODUCTION

This ergonomic job analysis is based on a typical factory layout for injection moulding and packing of plastic forks and spoons. The present investigation is a structured approach for identifying risk factors associated with overexertion injuries and disorders. The job analysis survey was confined to injection moulding of styrene (plastic) section involved in plastic forks and spoons.

Many risk factors could occur on more than one element, for example, repetitive motions, awkward postures, temperature extremes, etc. The results of an ergonomic evaluation or risk factors associated with each specific work element of plastic forks/spoons packing job were separately analysed.

2. JOB DESCRIPTION

The job in this study is plastic forks and spoons packing in the injection moulding department. Working on any injection moulding assembly line, the ergonomic stresses do not usually differ from hour to hour, or even day to day. A total of 9 out of 11 injection moulding machines were in operation at the time of survey, and each machine required only one worker. A

particular worker at Machine #I4 (see Figure 1) was studied and interviewed. She has been on the same job for 17 months.

After the injection moulding process, the 'packer' at the packing station has to use both

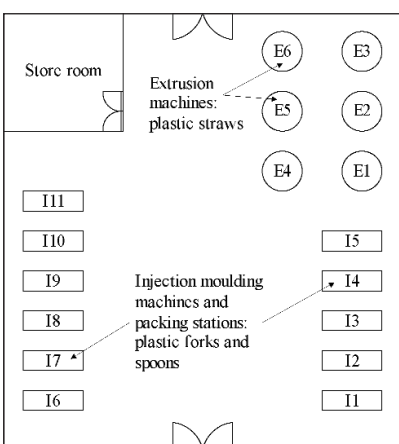


Figure 1: General layout plan of a single storey plastic injection moulding and extrusion plant

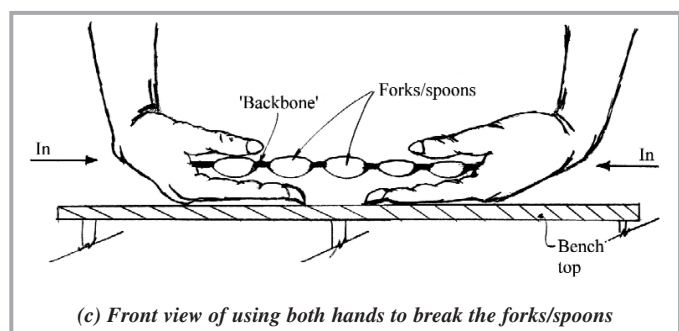
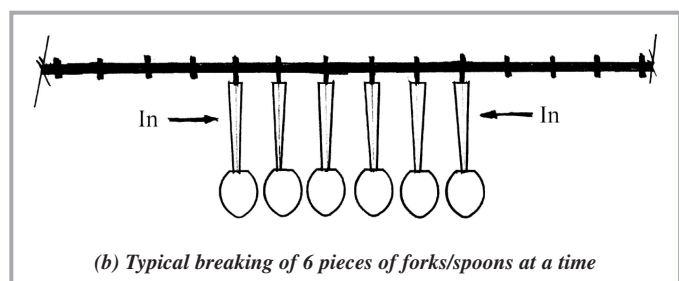
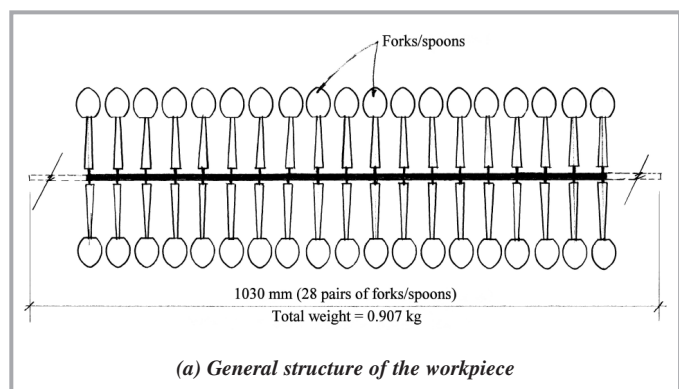


Figure 2: Workpiece and the typical way of breaking up the forks/spoons

hands to break up 5 to 8 forks/spoons at a time (see Figure 2) attached to the 'backbone' [see Figure 2(a)]. After that, the