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## 1. Objectives.

1.1. **General Objective:** “To carry out the Implementation of times and movements in the company of makings "LORENS" in the underwear line”.

### 1.2. Specific Objectives:

- To study each one of the variables that intervene in the handling of times and movements.
- To establish critical points of change in the current process to improve the production flow.
- To apply a Control of Methods in each one of the areas of the productive processes.
- To establish a method of evaluation of times in the making.
- To standardize the parameters that influence directly in the quality of the garments as well as the processes of the same ones to improve the productivity in the company of makings LORENS.

## 2. Justification:

At managerial level especially in the area of the makings the tendency exists at the moment to the application of Times and movements that bear to improve productivity and quality in the industry of the making, in view of that the managers they have seen each other in the necessity of its use.

With the realization of the present work one will be able to give to know the benefits that it bears the application of the methods in the company and therefore the improvement in the production.

Thanks to the experience that will be obtained after applying the different parameters that influence in the study of times and movements, correctly it will be possible to demonstrate the

efficiency of the same ones establishing standard models for the company of makings  
LORENS.

With the Implementation of times and movements in the company of makings "LORENS"  
in the underwear line will be possible to obtain better quality and a good flow in this line being  
able to mark an useful referent for the application in other lines.

### **3. Methodology.**

#### **3.1. Informative.**

He/she was carried out the same respective bibliographical gathering that he/she understood  
the following topics:

- Times and Movements.
- Machinery Used in the Making.
- Swinging of Modules.
- Sam.

You also uses audiovisual references as videos and information of companies that have  
already applied the system of Times and Movements.

#### **3.2.Of Implementation.**

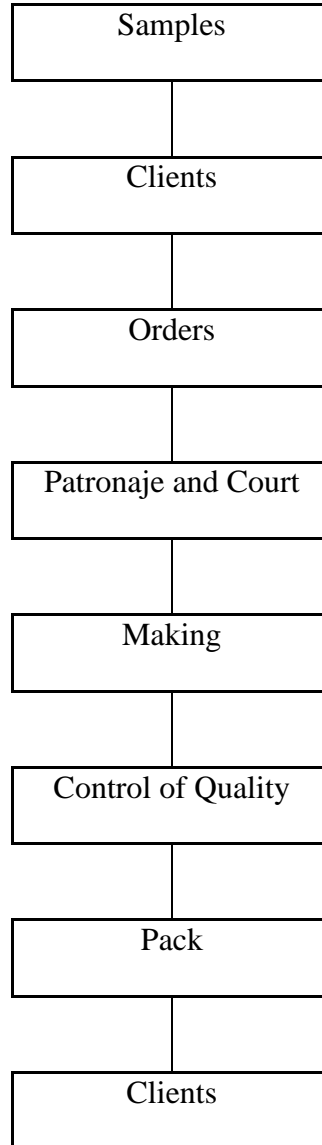
- The fundamental factor to achieve the development of the present work was the  
administrative personnel's so much collaboration as of the operators of the shop of  
makings, when understanding the benefits that he/she brings the application of the  
implanted techniques.
- After to evaluate and to understand the points of change in the productive process, you  
proceeded to carry out the relocation of the machinery and other work tools.

- Next it was enabled the personnel in the importance of managing a correct method in benefit of their health and of the same company.
- With the improved method you proceeded to the taking of times, in combined form the creation of the modules.
- Then he/she was carried out the calculation of the respective sams and the imposition of the goals according to the garment to make.
- Finally the work was evaluated carried out with the obtained data.

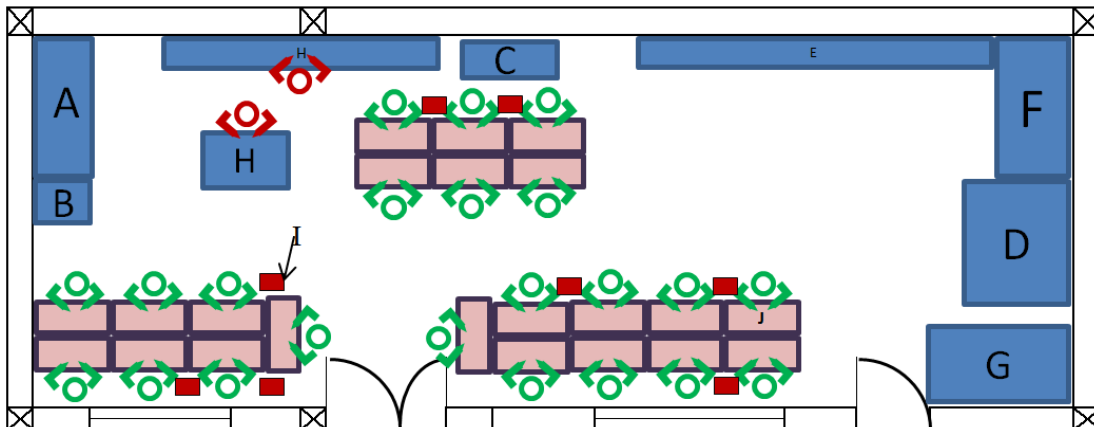
#### 4. Antecedents of the Company.

##### 4.1.General Antecedents.

Location	Cantón Antonio Ante, Provincia de Imbabura.	
Personal	Making	Control of Quality
	7	2
Product	Underwear	Children
		Girls
		ladies
		gentlemen
	Multure	

**4.2. Organization of the Production.**

### 4.3. Organization of the making shop



**A** threads

**B** box tools

**C** schemes cutting collarete

**D** packed garments

**E** wear made without revising

**F** collarete bookcase

**G** mass it cuts, garments without revising, you are captivated of flaw.

**H** tables revision and mass flow garments.

**I** auxiliary tables / seats

**J** Machines

#### 4.4. Control of the Production.

Control de Production.	It is expected to that the personnel finishes the work without control of the quantity taken place in unit of time
Reprocesos control	The unproductive time is passable in function that one needs the merchandise
Remuneration.	An equal quota is paid to the whole personnel.

#### 4.5. Control of Quality

To determine which is captivated it is "bad" or "well", it is left to people's approach in charge of the control and of having doubts it is consulted to the owner of the shop. One doesn't have exact parameters of control, he/she was carried out a control on foot of machine whose results are shown in the following square:

WEAR	BOXER
# SAMPLES	40
DEFECTS	
DEFECTO	QUANTITY
PERFORATED CLOTH	2
FLOATING THREADS	2
ASYMMETRY AMONG GARMENTS	2
BREAKE THE TIE	3
JUMPED STITCH	5
% UN QUALITY	35,00%

#### 4.6. Pack.

The packing process and count of the garments to surrender the people of control of quality and the proprietors of LOREN'S carry out.

You proceed to the packing for the method of blocks.

The distribution is carried out depending on the delivery place, either using the cooperatives of transport or in the vehicle characteristic of the company.

#### 4.7. Matter Prevails and Inputs.

He/she doesn't have a specific cellar for these materials, since the volume doesn't justify.

The cloth stores it to him in the court area, a very low cloth stock exists since he/she is carried out the orders depending on the production that is needed.

It is used threads of Chinese origin, which it is bought depending on the necessity of the shop an acceptable stock of labels Exist with the mark that has been used.





#### 4.8.Machinery.

##### AREA OF IT CUTS

MÁCHINE	TYPE	QUANTITY
VERTICAL LAWN MOWER	8"	1
LAWN MOWER OF NECKBAND	NORMAL	1

##### AREA OF MAKING

OVERLOCK	1 NEEDLE	
	2 NEEDLES	
RECUBRIDORA	COLLARETERA	2
	PLANA	2
TIRILLADORA	NORMAL	1
ELASTIQUERA	OVERLOCK	2
	RECUBRIDORA	1
OJALADORA	ZIG-ZAG	1
RECTA	1 NEEDLE	3

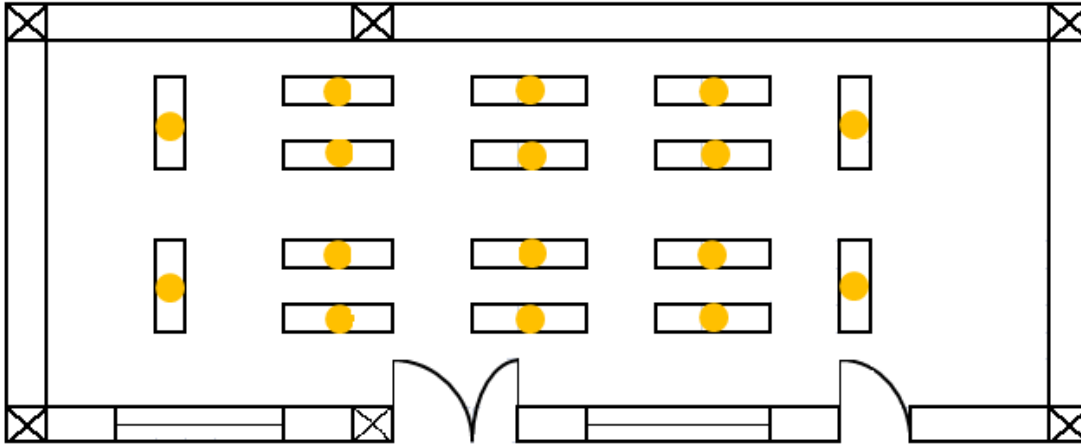
The special machines as the elastiqueras, ojaladora and tirilladora, are already machines several used years, however they possess a relatively acceptable speed for the production.

In the concerning thing to the other types of machines, we can say that it is trying to change then they are teams that already possess a considerable deterioration, and it causes nuisances because they need of constant maintenance.

#### 4.9.Set of Work.

The making area is isolated of the area domiciliary.

## Electric Facilities.



The stars are distributed arbitrarily according to at some time it was needed, it is so the machines it is about locating them as there is light. The cable that has been used for this is wired of number 12 and 14, wire patches exist #16.

For the plugs it has been distributed in an air way with wired wire #12, and the takings are in not well state, for what one has a risk of electrocutions.

As much the stars as the plugs are to a height of 2m.

He/she has a good ventilation, like you can appreciate in the enclosed graph, in the event of needing heat, he/she closes the doors. One doesn't work with products that can generate toxic gases for the personnel.

## Occupational Health.

To confront any emergency type, he/she moves to the nearest center of Health, one doesn't have an emergency first-aid kit.

Regrettably a protection culture has not been inculcated, he/she is so the personnel he/she doesn't want to use masks, although they should make it.

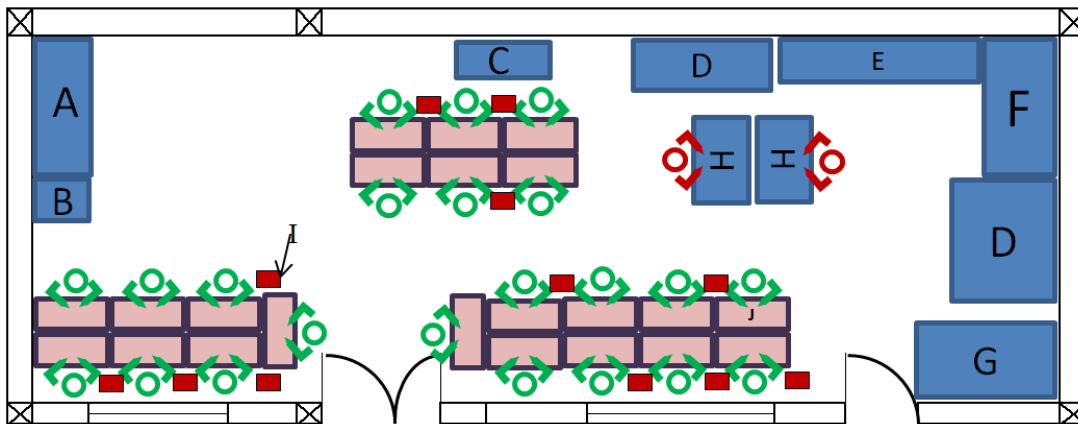
## 5. Implementation of the System.

### 5.1.Methods.

#### 5.1.1. Organization.

He/she was carried out personnel's distribution, machinery and materials so one could obtain the following advantages:

- Better flow of Production.
- Elimination of unnecessary times for search of materials.
- Bigger Concentration in the Work.



**A** threads

**B** box tools

**C** schemes cutting collarete

**D** packed garments

**E** you are captivated made without revising

**F** collarete bookcase

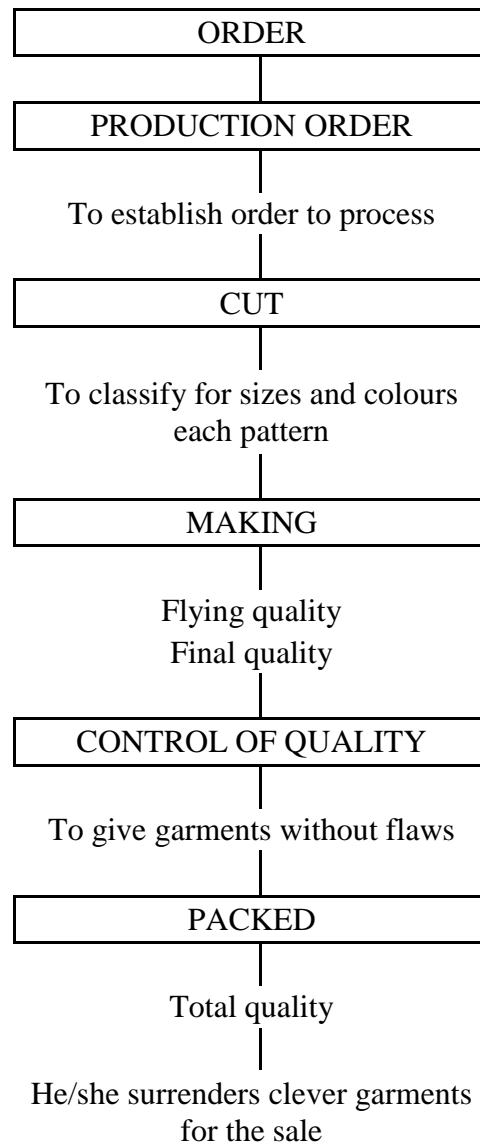
**G** mass of cuts

**H** tables revision

**I** auxiliary tables / seats

**J** machine

Also proceeded to improve the production flujograma the same one that I am in the following way:



With which is obtained the following advantages:

- Smaller time of production thanks to the previous control of samples.
- Stock decrease in process for the handling of the Order of Production (Kanban).

### **5.1.2. Movements.**

It was enabled the personnel for the elimination of unnecessary movements during the execution of the work as well as in the transfer of packages, being obtained the following advantages:

- Smaller fatigue in the personnel.
- Decrease in the unproductive times.
- Bigger production.

### **5.1.3. Quality.**

You implements parameters of quality that put on in the whole personnel's knowledge for their correct application, being obtained the following advantages:

- Smaller time of reproceso.
- Bigger acceptance of the product in the market.

Use of control formats is also made that have helped to lower the level of Non Quality in the shop in general.

## **5.2. Times.**

### **5.2.1. Sam.**

For the obtaining of SAM use of the following formula was made:

$$\text{SAM} = (\text{Time timed in minutes} + \text{time manages packages}) * \% \text{ eficiencia} * \% \text{ suplementos}$$

### 5.2.2. Swinging to Modulate.

Already with established SAM, you proceed to arm the respective modules, then he/she settles down the quantities that should take place according to each operator's efficiency and the number of people, with the following formula:

The swinging of lines is carried out according to the following outline:

$$meta = \frac{\# \text{ persons} * \# \text{ minutes} * \text{total efficient}}{sam}$$

The swinging of your line he/she is carried out according to the following outline:

I NUMBER OF OPERATIVES	3
MINUTES TEORICO*OPERARIO	480
THEORETICAL TOTAL MINUTES	1440
EFFICIENTY	100%
PRODUCED MINUTES	1440
TOTAL SAM	4,37

UNITS GOAL	330
DAILY HOURS	8
UNITS HOUR	41

OPERACIÓN	QUANTITY	MACH	SAM Unitary	SAM	Minutes necessity	Puestos Teóricos	Asignación
To hit seats to back	1	4H OVRL	0,6238	0,6238	205,55	0,43	OP1
Front + back	1	4H OVRL	0,6157	0,6157	202,9	0,42	OP1
To hit elastic legs	1	RECUBR-FOLDER	1,1219	1,1219	369,7	0,77	OP2
To close side right	1	3H OVRL	0,5489	0,5489	180,86	0,38	OP1,OP3
To hit elastic waist	1	RECUBR-ELASQ	0,5519	0,5519	181,87	0,38	OP3
To close left side	1	3H OVRL	0,4684	0,4684	154,35	0,32	OP3
Finish off sides	1	RECTA	0,4394	0,4394	144,77	0,3	OP2
			SAM TOTAL	4,37	1440	3	

so that the operational distribution for each worker prepares according to its capacities and without overloading the work, obtaining this way a balance in the lines modulares

## 6. Conclusions.

- When implementing a System of Times and Movements in the company of makings "LORENS" in the underwear line there is been being able to improve the quality and production of the garments of girls' underwear, children, ladies and gentlemen.
  
- When studying each one of the variables that intervene in the handling of times and pertinent movements in this shop, it has been achieved as first step to improve the lay-out as well as the conditions of illumination, it stops then to improve the methods and lastly the times of making.
  
- To improve the production flow he/she settled down the critical points of change like they are:
  - o Culture of Quality.
  - o Parameters of Quality.
  - o Organization of personal.
  - o Organization of the Production.
  - o Daily control of Produced Quantities.
  - o Making Methods and Control of Quality.

determining the flaws that existed as for the quality of the garments in each one of the areas, then was implemented the parameters of quality, taking into account:

- Tolerances in you brake the tie in Seam.
- Consistency of Colors of threads and cloth.
- Tolerance in flaws for Matter Prevails.
- Tolerances in relation to flaws for Machinery.

with which he/she has improved the productive flow.

- Thanks to the implemented standards of quality he/she has been able to apply a Control of Methods in each one of the areas of the productive process, obtaining this way a low percentage of Non Quality, that is to say it has been possible to get off an alarming 140% until 3%, also for this objective has contributed the best organization in the production, the work atmosphere and the handling of the Order of Production.
- To establish a method of evaluation of times in the making, it was considered: Individual valuation and on the whole of the work force analyzing the state of the machinery and the conditions of the labor atmosphere that affect also to the personnel's yield, is so on the average the current efficiency of the shop it is of 95%.
- Then each one of the conditions, maintenance of the machinery, was evaluated to improve the cut, to motivate the personnel toward a better yield, knowledge of the acquired standards of quality.
- Then you concluded that he/she should improve these to increase the production.
- In general it has been possible to increase the production in 37,67% thanks to the application of a system of Times and Movements.



- The system can also be applied to another type of industries establishing the points to be and adapting the terms that imply this work toward the objectives layouts.

## **7. Recommendations.**

- The company of makings Lorens, he/she should carry out a constant pursuit of the execution of each one of the points that has been implanted.
- In the cut, he/she should be carried out a pertinent study that allows to establish the feasibility of the machinery purchase to spread the cloth, since when carrying out it manually bigger time it is needed. Likewise the necessity should be analyzed of having the printed lines by means of a Plotter, for what the ploteado service can be looked for and to hire specialized personnel that carries out the lines in a program designed for this end.
- Also to obtain better quality in the cut, a specialized person should be hired at half time or per hours according to amerite the case so that she carries out the cuts.
- With respect to the making area, it is recommended to improve the electric facilities according to technical specifications for the area of the makings.

- To maintain the organization of the area of the makings that allows the personnel's easy flow and of the products. All work is perfectible so it could also improve.
- To place wheels in the machines to allow the easy movement of the same ones, since the system needs of the machinery transfer according to the garment to be made.
- Not to neglect the maintenance of a culture of quality in the personnel, because this depends the quantities of re-processes that there is and for ende of the losses that this generates.
- To carry out a periodic maintenance of the machinery, because as it has been demonstrated in need their correct state so that it doesn't exist delays in the production.
- To take a qualification system to the personnel according to the requirements of the company, with the purpose of achieving a smaller resistance to the changes that are carried out in the same one.
- To analyze a payment system for Incentives, to be able to elevate the level of the personnel's production, so that a healthy competition is generated among the employees, avoiding problems since among them would give the contrary effect.

- To carry out a pursuit of the personnel's acting by means of a control of times for each operation, with the purpose of establishing changes that ameriten an improvement in the productivity, with the use of the Curve of Learning.
  
- To study and to consider the different Types of Sampling of times for the establishment of SAM, and this way to use the most suitable that is adjusted to the reality of the company of Makings Loren