INDUSTRIAL TRAINING REPORT
FOR
WORK TERM—I

CARRIED AT :

M/s. BAKEMAN'S HOME PRODUCTS LTD.
PATIALA

Prepared By :

VINAY KAPOOR

Roll No. 177/88

DEPARTMENT OF MECHANICAL & INDUSTRIAL ENGINEERING
THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY
(Deemed University)
PATIALA-147001.

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LETTER OF SUBMISSION

To

Mr.P.K.Kapoor,
Head Placement & Coordination,
Thaper Institute of Engg. & Tech.
PATIALA

Dear sir,

This report entiteled "Work Term - 1"Report" has been prepared by me as my work report for M/S Bakeman's Home Products Ltd. PATIALA. My training was under the supervision of Mr.S.P.Verma, Sr.Vice President(W).
This report has been written by me and has not received any previous acedimic credit at this or any other institution.

Yours sincerly,

Vinay

Vinay Kapoor.
Vinay
(Roll No.177/88)

CERTIFICATE FROM THE SUPERVISOR

Certified that Mr.Vinay Kapoor has done his work term - 1 training (25.2.91 to 31.7.91) under my supervision. All the projects mentioned in the report have been carried out by him. He has been reguler during the course of the training.

(S.P.Verma)

Sr.Vice President(W)

ACKNOLEDGEMENT

I wish to express my sincere gratitude to Mr. S.P.Verma for his expert guidence, generous help and precious time he spared for supervising and guiding me. I am also thankful to the whole of the staff especially to Mr.A.C.Sainy, Mr.Mool Raj Mehta, Mr.Tejinder Singh and Mr.A.N.Gerg for their help and cooperation whenever desired.

I am also thankful to Pr.Neeraj Kansal(training incharge) ~~whose~~ and also to my parents whose constant help and inspiration inspired me to complete my training sucessfully.

I am also thankful to my friend Mr.Jatinder singh Saggu for helping me to make final version of this report.

Vinay

Vinay Kapoor

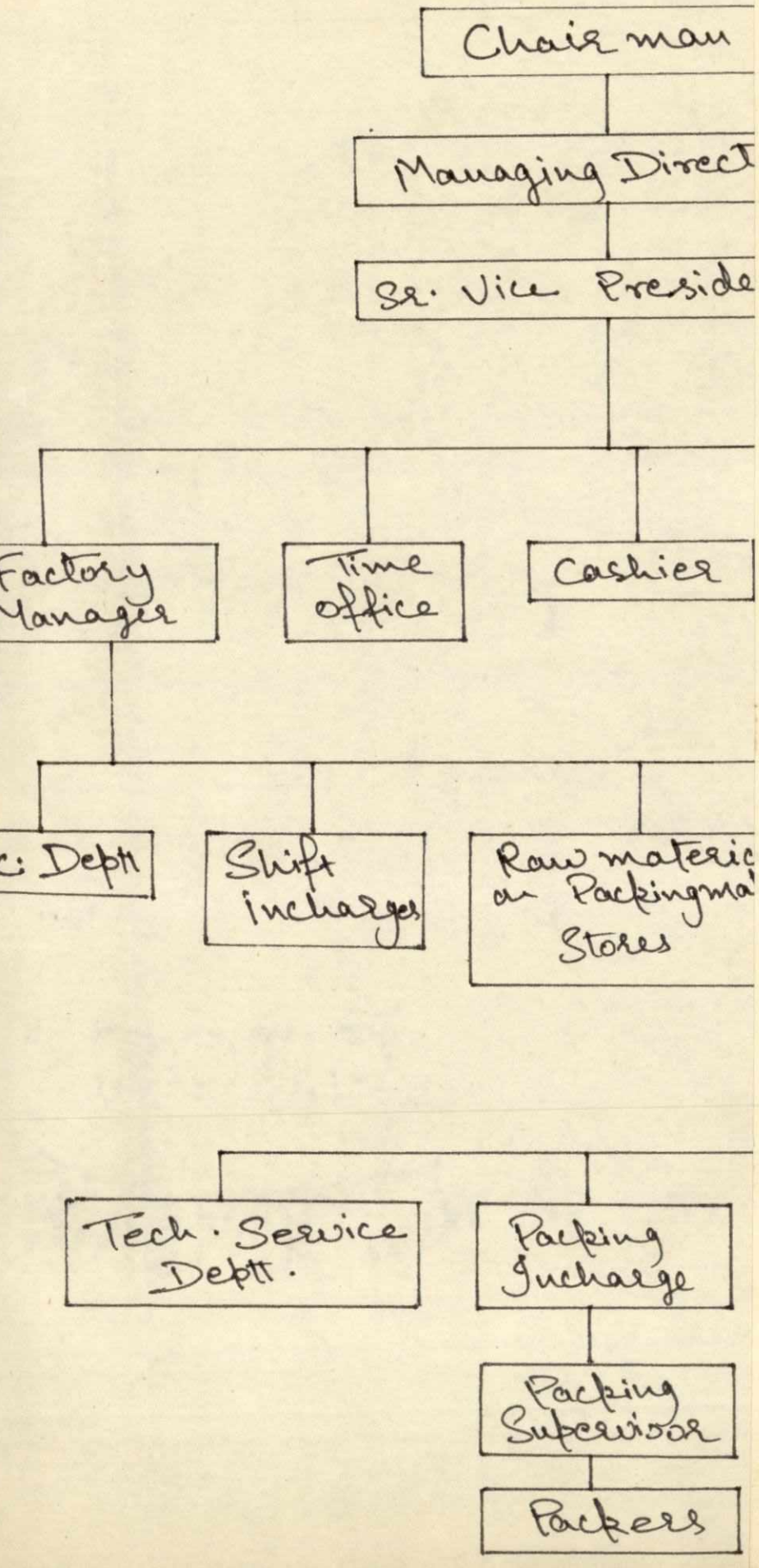
An Introduction to the company

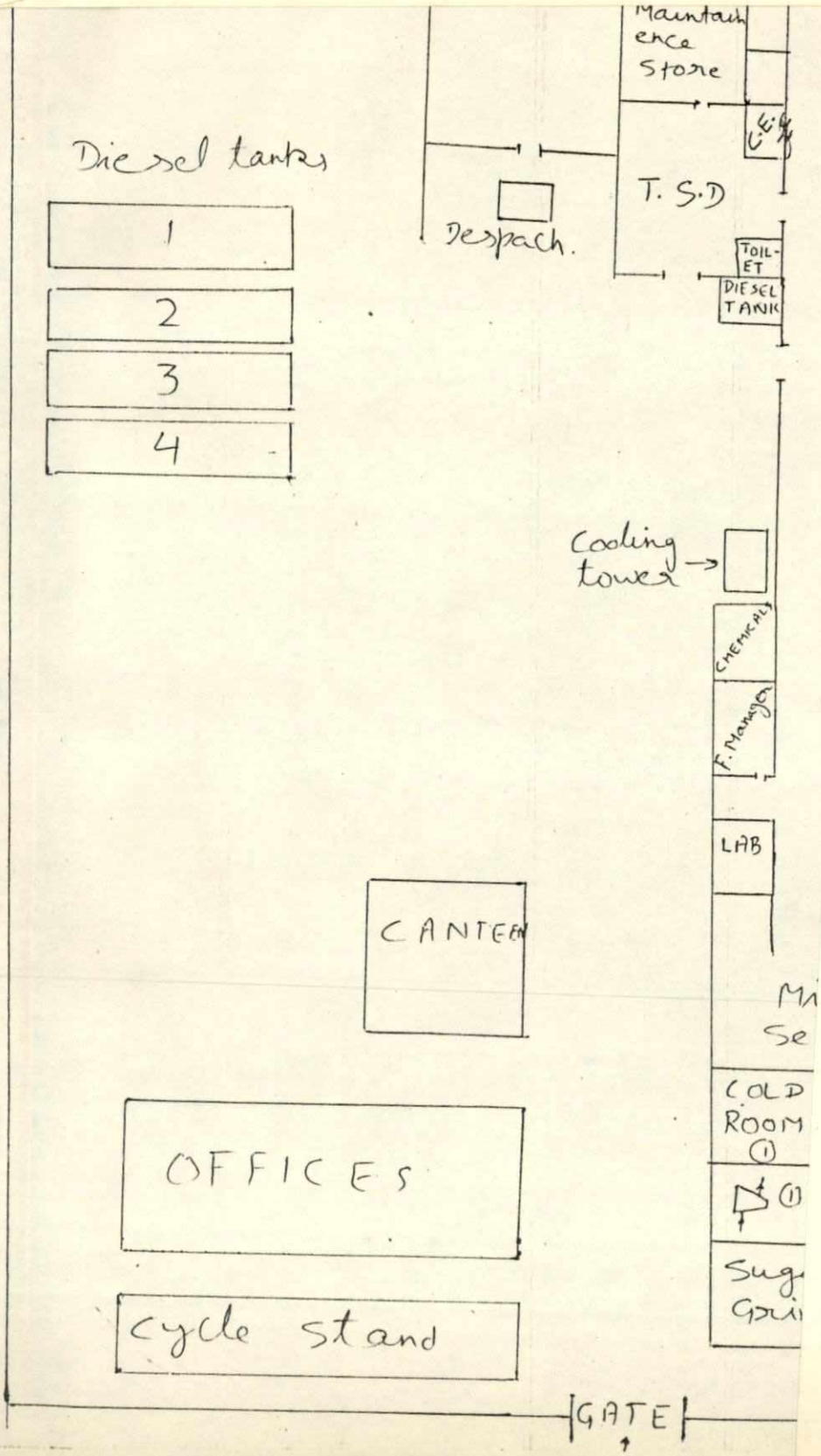
M/S Bakeman's Home Products Ltd. PATIALA is one of the leading companies engaged in the manufacturing and trading activity of biscuits & confactionary. The Bakeman's are the manufacturers of various types of biscuits, bread, cakes and other confactionary items and also of soaps and detergetts. The unit at Patiala where I have gone through my training produces biscuits only.

The unit came into existence in Nov'77 as a partnership concern It was converted into Pvt. Ltd. company which later on became a Ltd. company as is in its present form.

The annual turnover of this unit is about Rs. 30 crore. Average production per week is about 225 tons. Total employee strength is about 350.

Hierarchy of Mana




Maintain
ence
Store
Diesel tanks
1
2
3
4
T. S.D
Despach.
TOIL-
ET
DIESEL
TANK
Cooling
tower
CHEMICAL
F. MANAGER
LAB
CANTEEN
COLD
ROOM
(1)
(1)
OFFICES
cycle stand
GATE

SOME IMPORTANT SECTIONS

The most important sections in the process of manufacturing of biscuits are the mixing section, ovens and the packing section.

MIXING SECTION

This section carries out the mixing of all the raw materials which are used to prepare biscuits. Mixing is done in twp stages namely creaming and mixing. In the first stage i.e creaming, all the constituents except maida(wheat flour) are added to drum and are mixed for a standard fixed time depending upon the varity.

After creaming the drum is carried to maida section where maida ~~is~~ in the required amount is added. The constituents are again mixed for a standard fixed time until it ready to be fed to the die. Mixing time is of prime importence as it is one of the controling factors of the gauge of the biscuits.

There are 5 verticle and 2 horizontal mixtures in the mixing section.

OVENS

Each plant has its own oven. The ovens have diesel fired burners. The biscuits are passed throuhg the oven on a wire mesh conveyor belt. ~~The~~ Each burner is fitted with a circulatory fan and a terbulence fan.

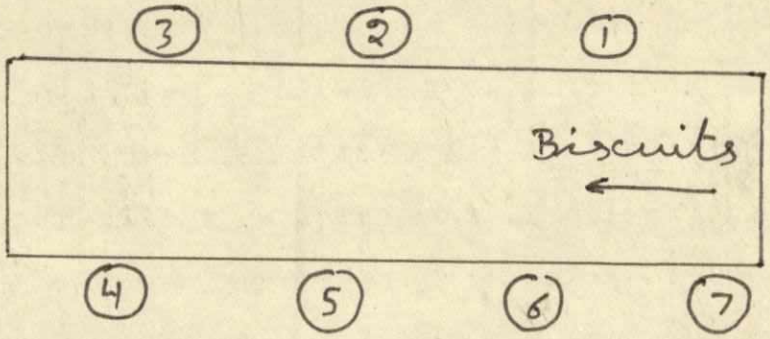
The heat produced by the burners is ~~spredd~~ spread below the wire conveyor belt. ~~In this way~~ by the circulatory fan. The terbulence fan spreads the hot air coming up over the conveyor belt.

In this way the ~~heat~~ biscuits get uniform heat from all the sides. Oven has two chimneys corresponding to each burner,

one for expelsion of flue gases and the other for moisture.

PACKING SECTION

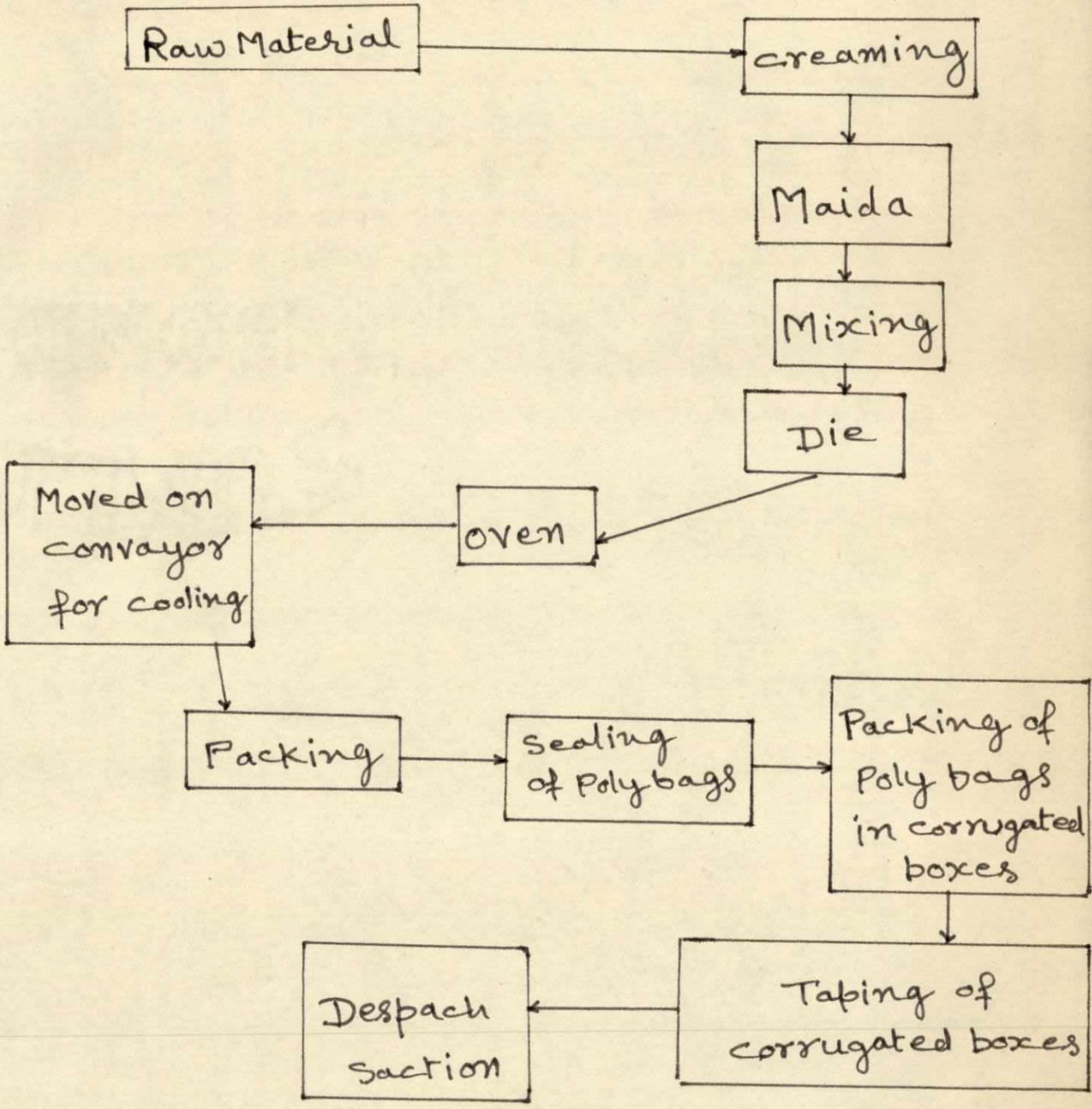
Packing section is the most important part of the factory as whole of the production has to be packed as sooj as it Ps produced. so that it may not absorb moisture from air. (Plant - A) After backing, the biscuits are moved on a conveyor belt through a distance of about 75m so that they get cooled. After this biscuits are made to move on a wire conveyor in 22 lines. There are 7 packing machines on both sides of the conveyor belt(one of the machines is stand by) as shown below.



Out of the 7 6 machines, usually2 machines are for 100 Gms. packets and 4 machines are for 75 Gms. packets. These machines share the total load as below.

Machine No.	Load
1	4 lines
2	7 lines
3	
5	7 lines
6	
7	4 lines

Material Flow Diagram of the Product



Bakeman's

Bakeman's
Glucose Plus

Bakeman's
Glucose Plus
BISCUITS

Bakeman's
Glucose Plus

Bakeman's
Glucose Plus

CONTAINS WHEAT FLOUR, SUGAR, VANASPATI, LIQUID GLUCOSE, EDIBLE STARCH, LEAVENING AND DOUGH CONDITIONING AGENTS, MALT EXTRACT, SALT, MILK AND MILK PRODUCTS. PERMITTED EMULSIFIERS AND ANTIOXIDANTS.

CONTAINS ADDED FLAVOURS AND PERMITTED COLOURS.

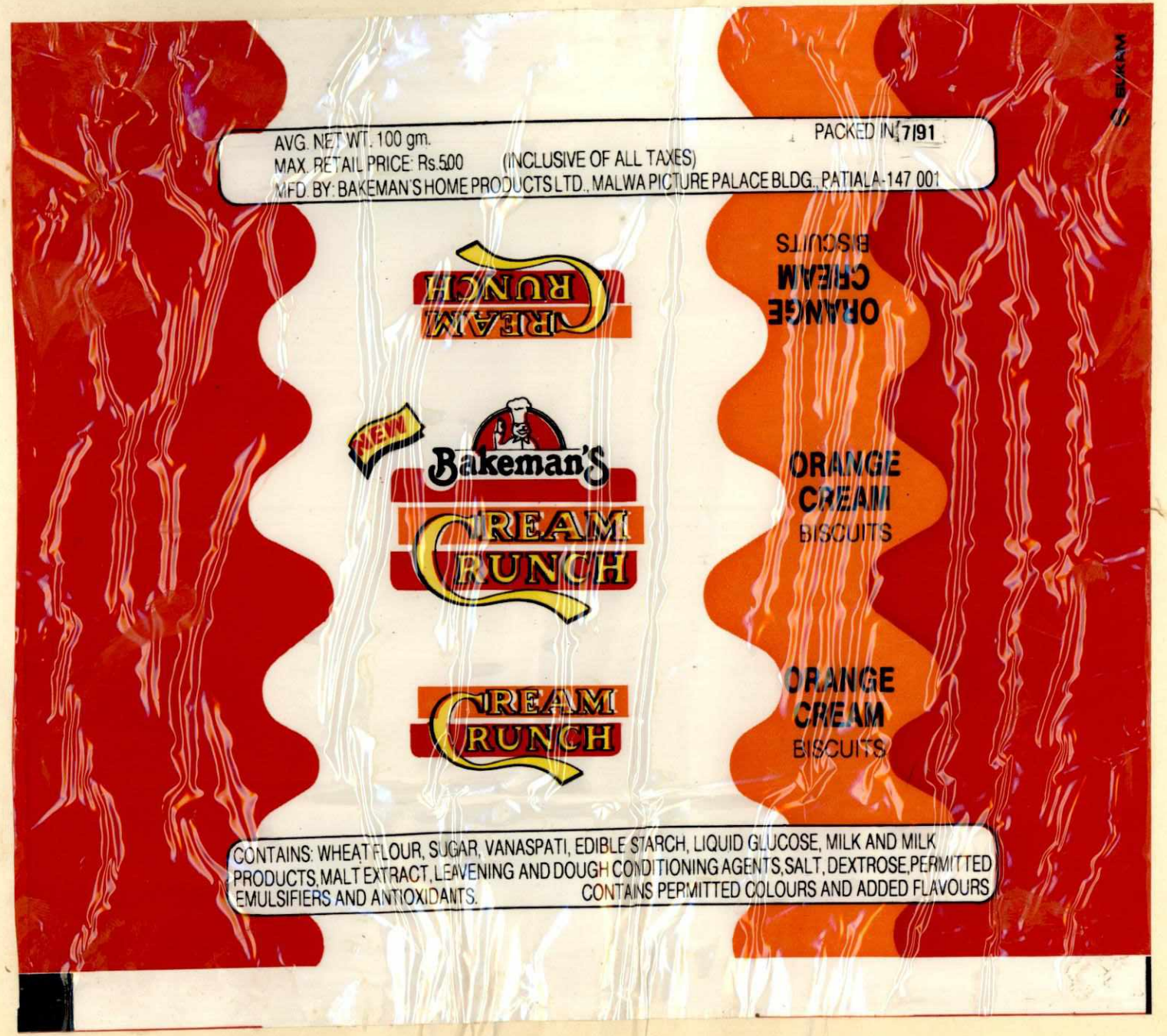
Average Nett Wt. 100 GMS. PACKED IN 7/91

Max. Retail Price Rs. 2.75 (Inclusive of all taxes)

IS:1011

MFD. BY: BAKEMAN'S HOME PRODUCTS LTD.
MALWA PICTURE PALACE BLDG., PATIALA-147 001

0713138


AVG. NET WT. 100 gm.
PACKED IN 7/91
MAX. RETAIL PRICE: Rs.5.00 (INCLUSIVE OF ALL TAXES)
MFD. BY: BAKEMAN'S HOME PRODUCTS LTD., MALWA PICTURE PALACE BLDG., PATIALA-147 001
NEW
Bakeman's
CREAM CRUNCH
ORANGE CREAM BISCUITS
ORANGE CREAM BISCUITS
CONTAINS: WHEAT FLOUR, SUGAR, VANASPATI, EDIBLE STARCH, LIQUID GLUCOSE, MILK AND MILK PRODUCTS, MALT EXTRACT, LEAVENING AND DOUGH CONDITIONING AGENTS, SALT, DEXTROSE, PERMITTED EMULSIFIERS AND ANTIOXIDANTS.
CONTAINS PERMITTED COLOURS AND ADDED FLAVOURS

STUDY OF SUGAR GRINDING SECTION

INTRODUCTION :- In biscuits, sugar is not added as such but in form of fine powder. Sugar crystals are grinded in the sugar grinding shop. There are two grinding machines for this purpose. Daily requirement of sugar powder is about 15 ton. The aim of this study isto conduct method study so that the efficient method may be devolped for sugar grinding.

Defination Of Method Study :- Method Study is the systematic recording and critical examination of the existing and proposed ways of doing work , as a means of devolping and applying easier and most effectine methods.

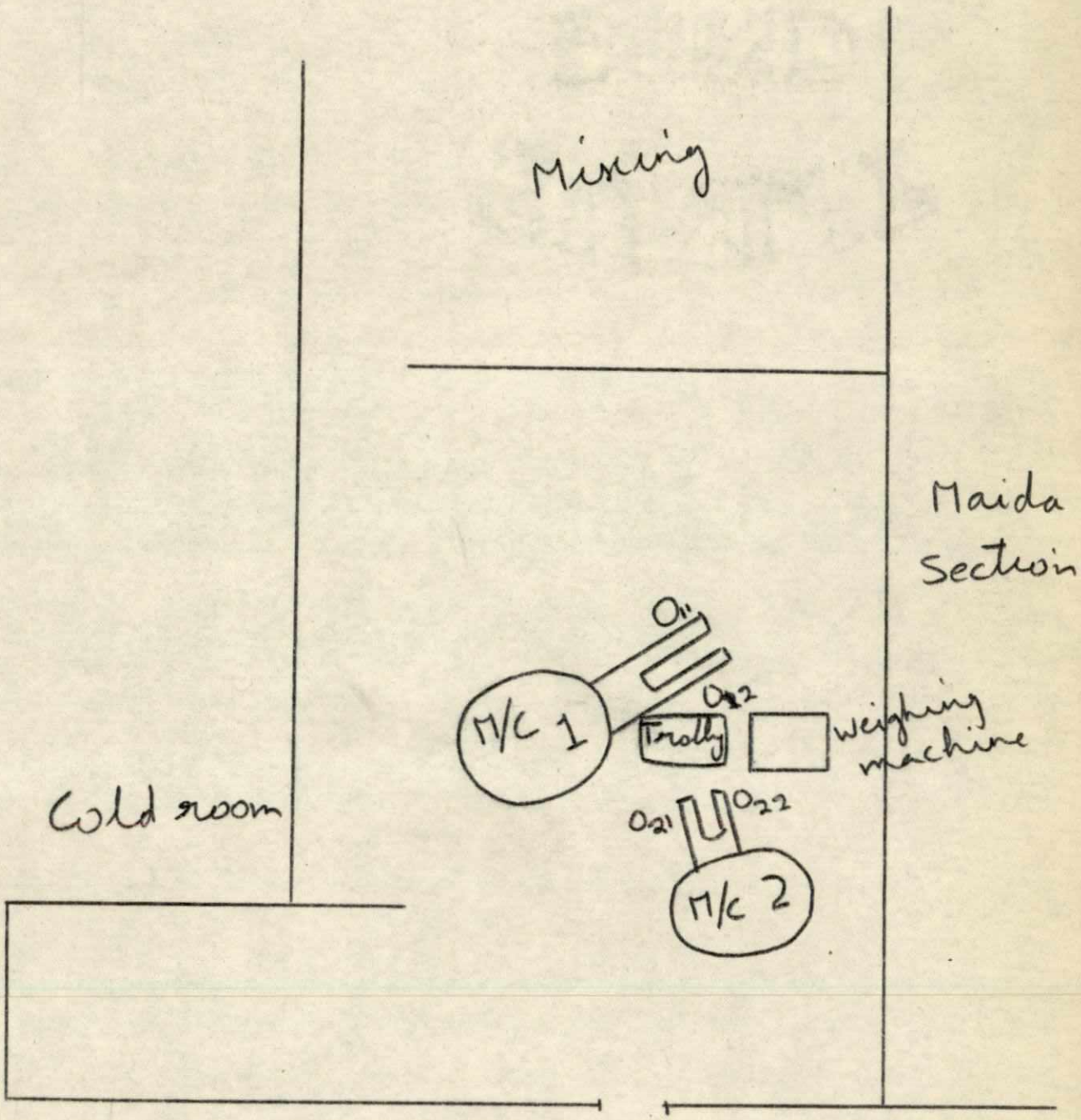
About Sugar Grinding Machine :-

A sugar grinder has one inlet for sugar crystals and two outlets for sugar powder. Sugar is crystals are fed to the machine manually and sugar powder is collected from the two outlets from one at a time alternatively one by one.

Symbols Used:-

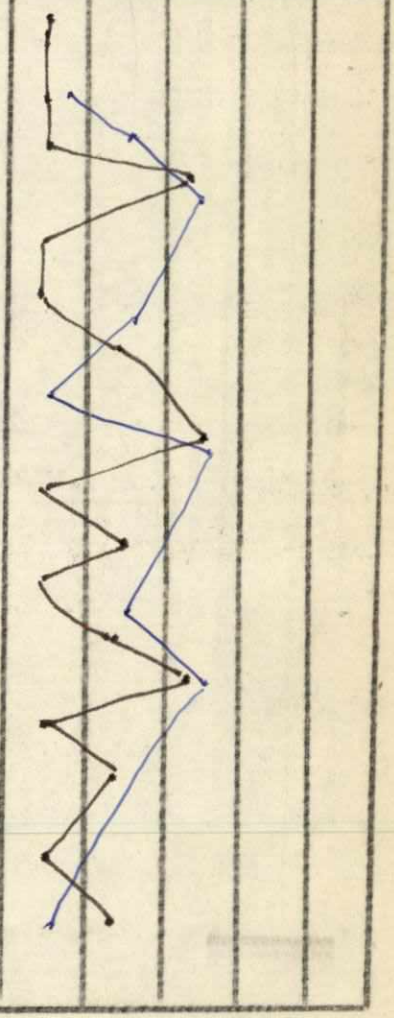
O_{11} & O_{12}	—	Outlets of machine 1
O_{21} & O_{22}	—	Outlets of machine 2
W_1, W_2	—	Workers

LAY OUT OF THE SUGAR GRINDING SHOP



Flow Process Chart: Man Type	Operation ○ Transport ⇨ Delay D Inspection □ Storage ▽
Subject Charted : Sugar Grinding	
ACTIVITY : Feeding, Tying, Weighing, lifting	
Method : Present	

DESCRIPTION	Symbol ○ ⇨ D □ ▽
W_1 opened P_{12} and closed P_{11}	
Placed the filled bag on weighing machine	
W_2 tied another bag on weighing machine	
W_1 and W_2 placed the weighed bag on trolly	
Both are idle	
W_1 closed O_{22} and opened O_{21}	
W_1 placed the bag on weighing machine	
W_1 and W_2 placed the weighed bag on trolly	
W_2 tied another on O_{22}	
Both are idle	
W_1 opened O_{12} and closed O_{11}	
W_1 placed the filled bag on weighing machine	
W_1 tied another bag on O_{11}	
W_1 and W_2 placed the weighed bag on trolly	
Both are idle	
W_1 closed ~~O_{12}~~ O_{21} and opened O_{22}	
W_1 placed the filled bag on ~~trolly~~ weighing machine	
W_1 tied another bag on O_{21}	
W_1 and W_2 placed the weighed bag on trolly	

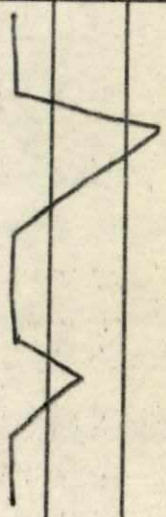


Black → W_1

Blue → W_2

One man , one machine

Flow Process Chart : Man Type	Operation ○
Subject Charted : Sugar Grinding	Transport ⇨
Activity : Feeding, Typing, Weighing, Lifting	Delay D
Mothod : Proposed	Inspection □
	Storage ▽

DESCRIPTION	Symbol
-Worker ties bags on O_{11} and O_{12} (O_{12} closed, O_{11} opened) - Feeds sugar to machine -Idle - O_{12} opened , O11 closed - Worker places the filled bag on weighing machine - Ties another bag on O_{11} - Places the weighed bag on trolly - Feeds sugar to machine - O_{12} closed , O_{11} opened	○ ⇨ D □ ▽ 

OBSERVATIONS :- Time taken to grinde one bag (100Kg) of sugar.

Machine no. 1 :

Sr.no.	Time	Remarks
1.	8.5 min.	Normal feeding of machine
2.	13 min.	Insufficient feeding of machine
3.	8 min.	Normal feeding of machine
4.	11 min.	Insufficient feeding of machine
5.	8.5 min.	Normal feeding of machine

Machine no. 2 :

Sr.no.	Time	Remarks
1.	19 min.	Insufficient feeding of machine
2.	13 min.	Normal feeding of machine
3.	13.5min.	Normal feeding of machine
4.	18 min.	Insufficient feeding of machine
5.	14 min.	Normal feeding of machine

So we may conclude that under normal conditions, time taken by machine no.1 to grinde 100 Kg of sugar is 8.5 minutes and that of machine no.2 is 13.5 minutes.

This difference is due to the fact that machine no.2 is operating at lower R.P.M's than machine no. 1

RECOMENDATIONS :-

1. It has been observed that one person is not able to keep the hopper of both the machines full for all the time.The machine runs with its hoppers partially filled or it may be over loaded and get jammed. Ithas been ~~observed~~* noted that if machine is run with its hopper always filled with sugar,about 50 seconds are gained for each 100Kg of sugar.

   So to feed the machine properly and uniformally,it should be fed by some mechanical means.

2. The sugar powder produced by the machine alsee scatters in air and goes into lungs of workers when they breathe which may be injurious to their health in long term.So proper ~~vet~~ ventilation and exhaust system must be applied there.

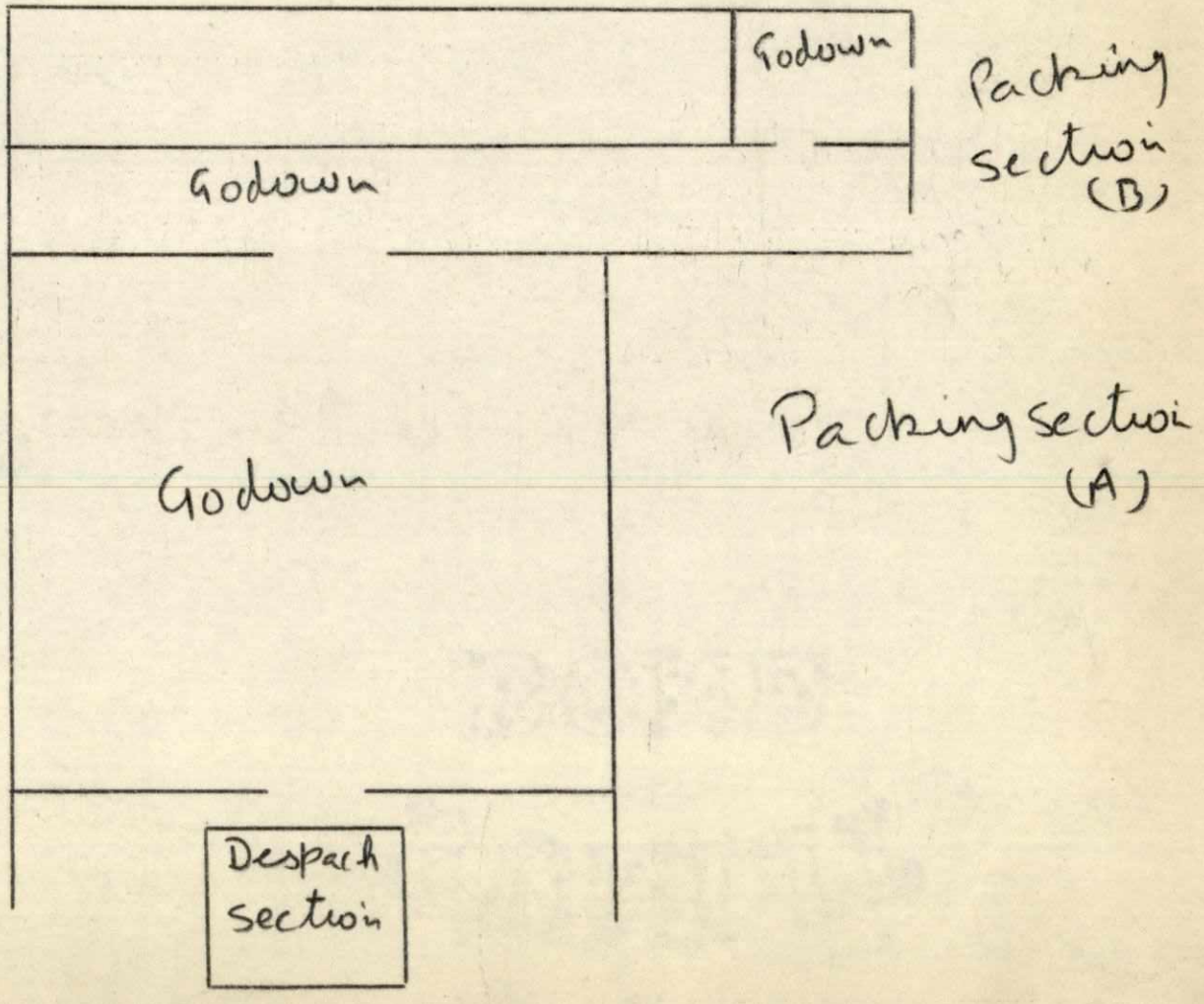
RESULTS :-

If both machines are fed properly and run at proper speed and are fed properly,each machine will take 8minutes to grind on 100 Kg of sugar; So 15000 Kg of sugar will be grinded in 10 hours.

OBJECTIVE:- To study loading of biscuits on trucks in the 'Despach Section' and to trace out the factors which cause breakage and to suggest possible solutions to this problem

II INTRODUCTION The corrugated boxes are moved from the godowns to the trucks with the help of mgnually operated hydraulic trolly.The boxes are then slipped into the vehicle on an iron sheet placed in it by two workers .Other two workers in the truck pick these boxes and stake them into the truck.

LAYOUT OF GODOWNS AND DESPACH SECTION



OBSERVATION:

1. Date: 5.4.91.

Truck No: PAH - 6845

Destination : Shuklagang.

Quantity loaded : 86 Qnt.

Surface condition of truck : Good (No projected nuts)

Extent of loading: 2 CB's above the truck body.

Handling: Rough.

Remarks : There were two battas in the truck. The boxes placed on the batta are only partially supported by batta and are likely to be damaged.

2. Date : 5.4.91

Truck No. : PB-11A 2895

Destination: Shuklagang.

Qnty. loaded : 87 Qunt.

Surface Condition : Normal .

Extent of loading : 3 CB's above the truck body.

Handling : Normal

Remarks : There were two battas in the truck which created gap of 6" to 7" between the boxes.

3. Date : 7.4.91

Truck No. : PCI-9665

destination : Gaziabad.

Qnty. loaded : 78 Qnt.

Surface condition : Normal (Bolts projected inside the truck).

Extent of loading : 2 boxes above the truck body.

Handling : Poor

Remarks: The material loaded was specially packed boxes for militarycanteens. These boxes are quite heavy to lift and difficult to handle. These boxes were fitted in a better way and batta beam caused no problem.

4. Date : 8.4.91

Truck No. : PJQ - 5848

Destination : Jammu

Qnty. loaded : 55 Qnt.

Suffgace condition: Normal

Extent of loading : One box above the truck body.

Remarks : The material loaded was specially packed boxes. There were two batta

One was removed by the driver. The boxes were heavy to handle.

5. Date : 8.4.1991

Truck No. : PB-11 3192

Destination : Patna

Qnty. loaded : 8.5 ton

Surface condition : Good (Round headed bolts)

Handling : Rough

Remarks : There occured too many collisions between the boxes while slipping them in the truck.

6. Date : 8.4.91

Truck No. : PAH 6076

Destination : Shuklagang

Qnty. loaded : 80 Qnt.

Surface condition : Good

Handling : Rough.

Remarks : Some boxes got rolled while slipping in the truck. There occured several collisions. There were two battas which produced gap of 7" to 8" between the ~~xxxx~~ boxes.

7. Date : 9.4.91

Truck No. : PAT 8733

Destination : Jaipur

Qnty. loaded : 90 Qnt.

Surface condition : Good

Extent of loading : 2 CB's above the truck body.

Handling : A bit rough.

Remarks : There occured collisions between the boxes severaltimes. There were two battas which hindered the proper fitting of the boxes.

8. Date : 9.4.91

Truck No. : PAT 8433

Destination : Jaipur

Qnty. loaded : 85 Qnt.

Surface condition : optimum

Extent of loading : 2 CB's above the truck body.

Handling : Rough

Remarks : Too many collisions.

9. Date : 9.4.91

Truck No. : HNK 5563

Destination : Delhi

Qnty, loaded : 80 Qnt.

Surface Condition : Normal

Extant of loading : 2 boxes above the truck body.

Handling : Normal

Remarks : The material loaded were special boxes. There was only one batta. There were triangular projections for tyres which were accomodated by using stones and wooden pieces.

10. Date : 10.4.91

Tempo No. : PCP 1428 (Sawraj Mazda)

Destination : Delhi

Qnty. loaded : 50 Qnt.

Extent of loading : 2 CB's above the truck body.

Handling : Good

Remarks : There was only one batta (Circular pipe) which created no problem. Handling was easy due to small height of the vehicle.

11. Date : 10.4.91

Truck No. : PUV 9788

Destination : Jammu

Qnty. Packed : 84 Qnt.

Surface condition : Not very good

Extent of loading : One box above the truck body.

Remarks : Special packing, there was ove batta which did n't create any problem.

12. Date : 10.4.91

Truck No : PCI (Tempo) 4656

Destination : Delhi

Qnty. loaded : 50 Qnt.

Surface Condition : Good

Handling : Good

Remarks : There was only one batta, (Circular pipe) Boxes were n't placed over batta. That place was kept empty.

13. Date : 10.4.91

Truck No. : PIP 5795

Destination : Shuklagang

Qnty. loaded : 85 Qnt.

Surface Condition : Good (No projection)

Extent of loading : 2 CB's above the truck body.

Handling : Normal

Remarks : There was one batta in the truck. The boxes placed on the batta had N't proper support are were likely to be damaged.

14. Date : 11.4.91

Truck No : PJP 8745

Destination : Shuklagang

Qnty. loaded : 87 Qnt.

Surface Condition : Normal

bolts were projected inside the body of the truck.

Extent of loading : 2 CB's above the truck body.

15. Date : 11.4.91

Truck No : PB-11B 4745

Destination : Shuklagang

Qnty. loaded : 76 Qnt.

Surface Condition : Good (No projection)

Handling : Good (Minimum collisions)

Extent of loading : 2 CB's above the truck body.

Remarks : There were two battas which a gap of 8" between the box and batta. Had the angular projections (for bamboo) on the batta removed, the boxed could be fitted properly.

16. Date : 12.4.91

Truck No : PB-11 9465

Destination : Shuklagang

Surface Condition : Good

Handling : Good

Extent of loading : 2 CB's above the truck body.

17. Date : 12.4.91

Truck No : PB-11A 2545

Destination : Gajiabad

Surface condition of truck : Good, No bolts are projected inside the bodym of truck.

Handling : Rough

Extent of loading : One box above the truck body.

Remarks : The specially packed boxes are very heavy to lift and handle.

18. Date : 15.4.91

Tempo No. : PCI 4656

Destination : Ambala

Qnty. loaded : 215 Boxes

Surface condition : Good

Handling : Good

Extent of loading : one box above the body of vehicle.

Remarks : There was one batta in the form of circular pipe which was easily accommodated.

19. Date : 15.4.91

Truck No : PAT 8665

Destination : Gajiabad

Qnty loaded : 82 Qnt.

Surface condition : Normal

Handling : Rough

Extent of loading : 2 CB's above the truck body.

Remarks : The boxes were slipped into the truck without using the iron sheet. There occured too many collisions. During this act. The boxes placed on the batta are not supported properly.

20. Date : 15.4.91

Truck No : PCI 3245

Destination : Gajiabad.

Surface condition : Not Good.

Handling : Rough.

Extent of loading : 2 CB's above the truck body.

Remarks : The boxes were slipped without using the iron plate.

Results:

From previously mentioned study, it has been observed that the primary reasons of damaging of boxes are:

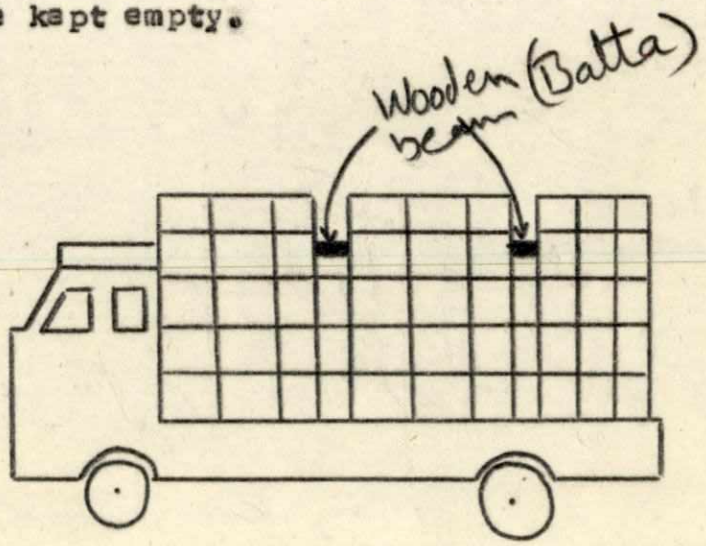
1. The gap created by the batta.
2. Rope tying
3. Collisions during slipping of boxes into the truck.

It has also been observed that the workers donot handle the boxes carefully when the supervisor is absent.

Suggestion:

There are three possible solution, of the problem created by the batta.

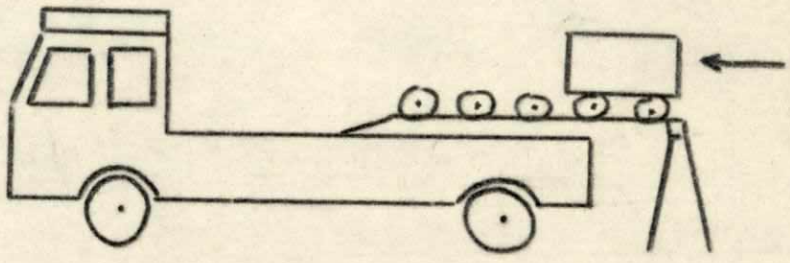
a. The gap may be filled by paralli to avoid impacts
b. The tnuck is loaded upto the batta.
c. The boxes are not lpaced over the batta i.e. that place should be kept empty.



The problem of rope tying has been solved by using wooden blocks to avoid contact of rope and box and to distribute the pull caused by rope uniformaly.

The handling of boxes can be improved by using a moveable rollar convayer instead of flat iron sheet.

This will ensure smooth flow of boxes and will reduced the collisions also



OBJECTIVE:- To study material handling in the packaging store and to minimise wastage.

INTRODUCTION:- Packaging store in the most important part of the industry as packaging materials constitute of the production cost. The main fucction of the packing store is to recive and to issue the packaging materials. The packaging m mateiral in daily shifted from main store to sub store from w where it is issued to the packing sectibns. The various mat- erials handled by store are wrappers, polybags, corrugated boxes, lables, slips, sealing paper, wax wated paper sheets, Gum take and stickers etc.

The aim of this study is to locate the short comings in the handling of materials and to trace out the wek points which lead to wastage or damage of packing materials.

The observation of this project are based on full time direct observation.

SPECIFICATIONS OF CORRUGATED BOXES

GLUCOSE 100 Gm.	15"x9.5"x11"
GLUCOSE 75 Gm.	15" x 7.5" x 13"
BUTTER CREAME	12.5" x 11.5" x 8"
ELACHI CREAME	12.5" x 11.5" x 10.5"
MILKO BIX	15.5" x 10.5" x 9.5"
COCONUT COKIES	11.5" x 9.5 " x 12.5"

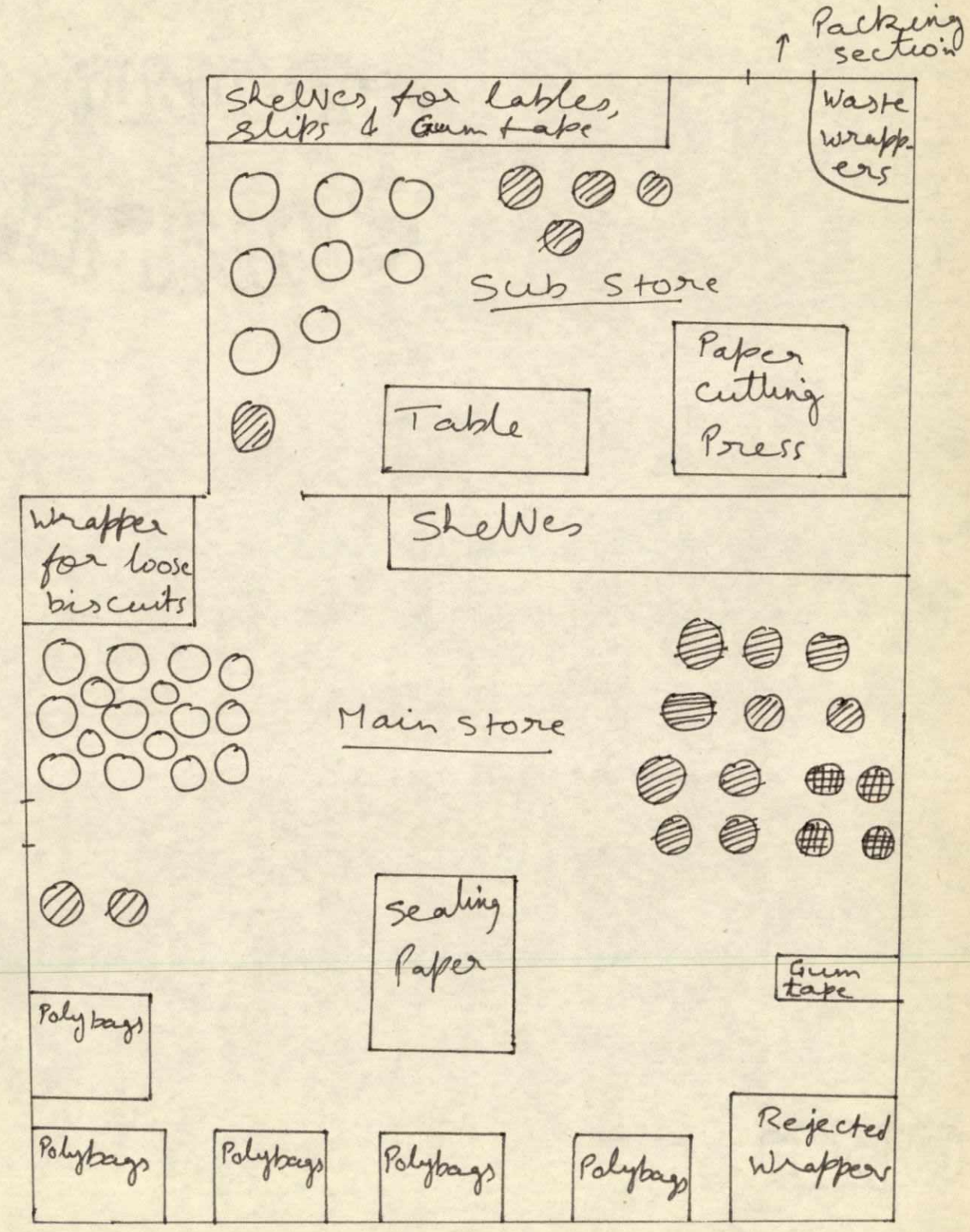
SPECIFICATIONS OF POLY BAGS

GLUCOSE 100 Gm.	9.5" x 11.5"
GLUCOSE 75 Gm.	9.5" x 14"
BUTTER CREAME	9.5" x 15"
ELAICHI CREAME	8.5" x 15"
MILKO BIX	10" x 14"
COCONUT COOKIES	13.5" x 13"

SPECIFICATIONS OF WRAPPER RODLS

Height of 100 Gm. rodl	180 ½ mm	(Printed)
Height of 75 Gm. roll	135 mm	(Printed)
Height of laminated roll	175 mm	

Layout of the store :-



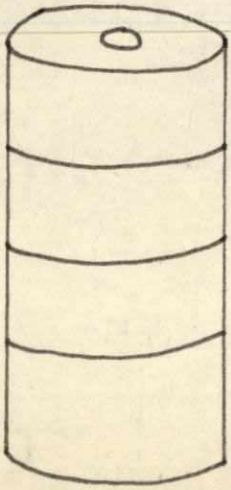
→ Wax coated Wrapper → Laminated Wrapper → Rejected Wrappers

Short comings observed:

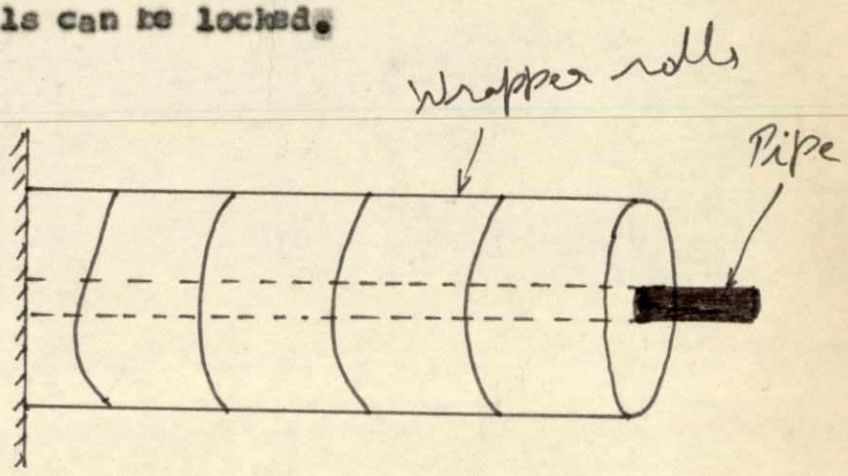
1. Many a times wrapper rolls are not used to full extent and these partially consumed rolls are sent to the store from packaging section. While consuming them, a lot of wrapper in wasted. Packaging incharge should be instructed to take care of this.

2. When the night shift is over, the polybags which are not used are returned back tp the sub store. While doing so, polybags of different sizes get mixed. It taken 2 to 3 hours to seperate them. Packaging incharge should be instructed to check that these don't get mixed.

3. The wrapper rolles are stacked vertically up to height of even 8 feet. The roll may be damaged if it falls down. Also there is every chance that it may hurt some one so the rolls can be hung on horizontal pipes. More over in this way of storing , rolls can be locked.

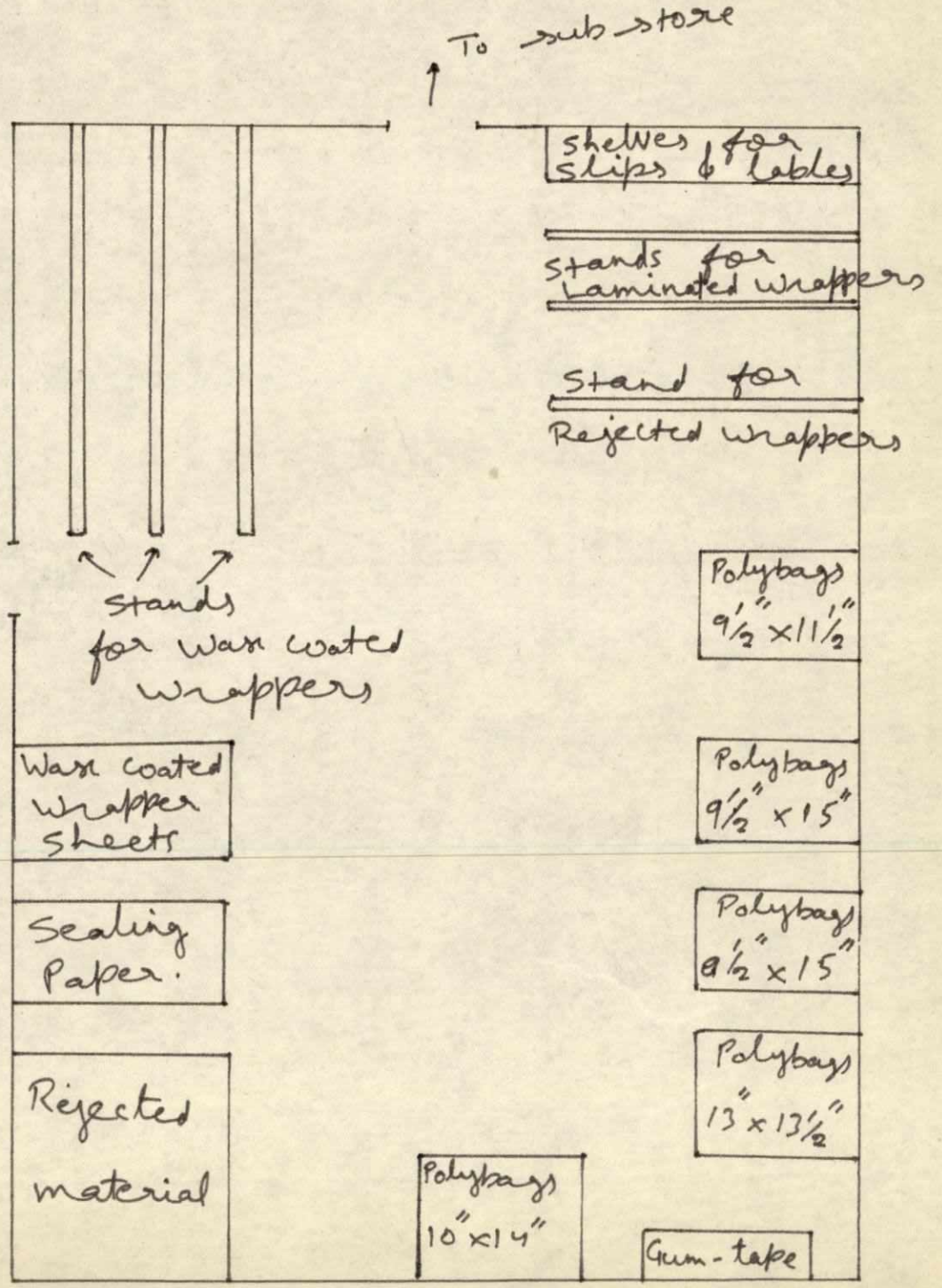


Present method



Proposed method

4. I t has been observed that all the items of store are laying haphazardly. Also waste and rejected material is not distinguished from other material. It will be better if seperate cabins or place is assigned for each material as following.



OBJECTIVE :- To calculate the efficiency of biscuit packing machine and to calculate machine power required to pack the present load.

INTRODUCTION :- Daily production of M/S Bakeman's Home Products Ltd. is about 56 tons. To pack these biscuits, they have highly productive machines. The aim of this project is to calculate how many machines are required to pack all the Glucose biscuits.

There are total 7 machines out of which 1 is standby and 6 are ~~required~~ used. The flow process chart of the whole of the process i.e from mixing section to packing section has been shown on the next page. Biscuits are cut on a die and then they are passed through an oven . After baking, the biscuits are made to travel a distance of about 70 meters so that they may cool. Biscuits are then packed and are send to despach section.

A SAMPLE SET OF CALCULATION OF EFFICIENCY OF MACHINE :-

Output of machine in 2 hours = 4880 PKTS.

Speed of machine on indicator = 70 PKTS/min.

Total time for which machine was not fed = 34.75 min.

Actual rate of output = ~~4880/4120~~ 4880/(120 - 34.75)

= 57.24 PKTS/min.

Efficiency =57.24/70

= 0.8178 =81.78 %

OBSERVATIONS :- (100 Gm. packets)

S.no	Duration (min.)	Output	Speed	Down time				Effi. %
				No supply	Wrapper change	Power failure	Total	
1.	120	4880	70	29	3.25	2.5	34.75	81.78
2.	120	6710	71	7	1.5	---	8.5	84.76
3.	120	6740	70	5.75	2.75	---	8.5	86.35
4.	120	5910	69	6.25	4.75	1(fault)	12	79.31
5.	120	6158	69	5.5	2.75	1	9.5	80.66
		(75 Gm. packets)						
1.	120	7590	84	5.75	5	---	10.75	82.71
2.	120	7570	84	6.25	5	---	11.25	82.87
3.	120	8480	86	5.5	2	1	8.5	88.43
4.	120	7170	79	5.5	3	--	8.5	81.40
5.	120	7270	82	6.0	2	--	8.0	79.16

~~Factors that tend to reduce efficiency are :-~~

II. Factors that tend to increase the idle time of the machine are :-

1. Many a times there are no biscuits on the conveyor belt. So machines are not fed for that time.

2. There may be some fault in the machine for which machine has to be stopped.

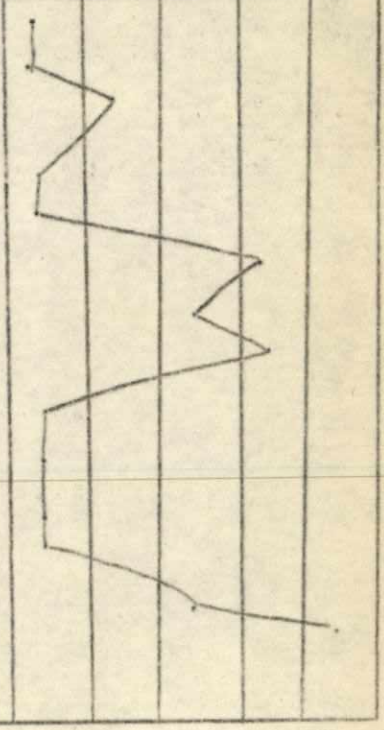
3. There may be fault in the wax coated wrapper which may cause sealing problem and may take time for making adjustments.

4.Machine is not fed for the time for which wrapper is changed.

5. operators ignorance i.e the operator may not feed the machine due to his ignorance.

FLOW PROCESS CHART :-

FLOW PROCESS CHART	OPERATION
TYPE : Material Type	TRANSPORT
	INSPECTION
Method : Present	DELAY
	STORAGE

DESCRIPTION	SYMBOL
Biscuits picked and placed on feeding table	
Biscuits fed to machine	
Inspected while moving in the track	
Packed and sealed by the machine	
Packets packed in polybags	
Awaited to be taken to sealing section	
Taken to sealing section	
Awaited to be sealed	
Polybags sealed	
Staked and put in corrugated boxes	
Corrugated boxes taped	
Corrugated boxes staked on wooden crate	
Wooden crate transported to store	
Storage	

OBSERVATIONS :- (For calculating machine - power)

S.no.	Machine no.	Varity	No. of lines being picked	Speed of machine	Die speed
1.	1	100 Gm.	4	70	16 R.P.M.
	2	75 Gm.	4	84	
	3	75 Gm.	3	80	
	5	75 Gm.	3	70	
	6	75 Gm.	4	84	
	7	100 Gm.	4	71	
2.	1	100 Gm.	4	76	16 R.P.M.
	2	75 Gm.	4	82	
	3	75 Gm.	3	75	
	5	75 Gm.	3 / 4 *	82	
	6	75 Gm.	4 / 3	76	
	7	100 Gm.	4	76	
3.	1	100 Gm.	4	74	15 R.P.M.
	2	75 Gm.	4	83	
	3	75 Gm.	3 / 4	81	
	5	75 Gm.	4 / 3	79	
	6	75 Gm.	3	78	
	7	100 Gm.	4	74	
4.	1	100 Gm.	5	76	16 R.P.M.
	2	75 Gm.	3	80	
	3	75 Gm.	3	76	

	5	75 Gm.	4	81	
	6	75 Gm.	3	74	
	7	100 Gm.	4	79	
5.	1	100 Gm.	4	71	16R.P.M.
	2	75 Gm.	4	86	
	3	75 Gm.	3 / 4	84	
	5	75 Gm.	4 / 3	86	
	6	75 Gm.	4	80	
	7	100 Gm.	4	77	
6.	1	100 Gm.	5	73	16R.P.M.
	2	75 Gm.	3	86	
	3	75 Gm.	3 / 4	80	
	5	75 Gm.	4 / 3	88	
	6	75 Gm.	3	80	
	7	100 Gm.	4	79	
7.	1	100 Gm.	5	73	16 R.P.M.
	2	75 Gm.	3	87	
	3	75 Gm.	4	73	
	4	100 Gm.	3	75	
	5	75 Gm.	3	75	
	6	75 Gm.	4	76	

S.No.	Machine no.	Varity	No.of lines being picked	Speed of machine	Die speed
8.	1	100 Gm.	4	75	15 R.P.M.
	2	75 Gm.	4	84	
	3	75 Gm.	2 / 3	69	
	4	100 Gm.	3 / 2	69	
	6	75 Gm.	4	79	
	7	100 Gm.	5	77	
9.	1	100 Gm.	4	69	15.5
	2	75 Gm.	4	84	
	3	100 Gm.	3 / 4	70	
	5	75 Gm.	4 / 3	78	
	6	75 Gm.	4 / 3	71	
	7	100 Gm.	3 / 4	70	
10.	1	100 Gm.	4	70	16 R.P.M.
	2	75 Gm.	3	71	
	3	75 Gm.	3	74	
	5	75 Gm.	4	72	
	6	75 Gm.	3	75	
	7	100 Gm.	5	70	
~~11.~~	~~4~~	~~100 Gm.~~			

* 3/4 means that both the
4/3 machines are sharing
load of 7 lines.

CALCULATION OF MACHINE'S POWER :-

The die that cuts biscuits has 12 X 26 impressions i.e in one revolution it produces 312 biscuits.

Now die speed = 16 R.P.M.

So biscuits produced per minute = 312 X 16

= 4992

4992 biscuits per minute means 416 packets (75 Gm.) per minute because 75 Gm. packet contains 12 biscuits.

Now this total load of 416 packets / min has been divided into 22 lines

so load per line = 18.9 i.e 19 packets per minute

Now we calculate the efficiency of machine for 1 hour observation

Total time = 60 min

Time taken to change the wrapper reel = 2.5 min.

Relaxation allowance = (7%) = 4.2 min.

Contingency allowance (3%) = 1.8 min.

Special allowance (for some fault in machine or in wrapper) = 1 min.

So efficiency =((60 - 9.5)/60)X 100 = 84 %

Now if load per line is 19 packets per min. for 75 Gm. it will be

19 x 12/16 =14.25 packets per min.(because 75 Gm packet contains 12 biscuits and 100 Gm packet contains 16 biscuits)

So the results for 75 GM. & 100 GM. machines for different loads can be tabulated as on the next page.

RESULTS :-

No. of lines being picked by the machine	Load for 75 Gm.	Load for 100 Gm.	Speed of operation 75 Gm.	Speed of operation 100 Gm.
3	57 PKT/min	43 PKT/min	67 PKT/min	51 PKT/min
4	76 PKT/min	57 PKT/min	90 PKT/min	68 PKT/min
5	95 PKT/min	72 PKT/min	113 PKT/min	86 PKT/min
3.5	66.5PKT/min	49 PKT/min	79 PKT/min	58 PKT/min

From the above results it is clear that a 75 Gm. machine can pick 3.5 lines and a 100 Gm. machine can pick 5 lines very easily and efficiently.

Now if 2 100 Gm. machines are run they will pick 10 lines.

The remaining 12 lines can be picked by 3.4 machines (because a 75 Gm. machine can pick 3.5 lines)

So total machines required are 2 + 3.4 = 5.4 machines.

OBJECTIVE :- To study various features of biscuits packing machine and to prepare a training programe for workers so that they may operate the machine safely and efficiently.

INTODUCTION :- It is a major requirement of any biscuit industry that biscuits are not exposed to air for long period after baking so that they may not absorb moisture. It is also essential from hygenic point of view. So one major requirement of any biscuit industry is that to pack the product oven fresh i.e in semi-hot condition. For this purpose, M/S Balsman's Home Products Ltd. have highly pp productive and highly efficient packing machines supplied by M/S Mobins of India.

Specifications of the machine :-

Driving power	=	1.5 H.P
No. of heaters	=	7
Cooling plates	=	12
Cooling temp.	=	5 ^{0}C to 8 ^{0}C
No. of workers needed	=	5
Floor area covered	=	

WORKING OF MACHINE :-

Working of whole of the machine can be described by dividing it into three sections.

1. FEEDING ZONE :- It includes feeding chain which has 16 links Its function is to carry the biscuits to the centeral zone where they are packed and sealed.

2. CENTRAL ZONE :- This is the most important part of the machine as it contains all the important parts as following.

i) Bobbins :- There are two bobbins in the machine which hold plane & printed wrapper wrapper rolls.

ii) Fix & rotary knife :- It is a pair of knives which cuts the wrapper. One of the knives is fixed and the other it rotates every time biscuits come in the cutting zone.

iii) Metal & rubber rolls :- It is a pair of rollers one made up of metal and the other is a rubber roller. Function of these is to pull the wrapper.

iv) Folding box :- Folding box wrappes the wrapper on the biscuit It rotates when biscuits come into it.

v) Silicon rubber :- It helps the wrapper to be wound tightly on the biscuit.

vi)

vi) Oscilatting rollers :- These rollers help to move the wrapper straight.

vii) Geneva :- It regulates the motion of folding box.

viii) Paper registeration :- It is natural tendecy of wrapper (in continuous motion) t hat it is pulled more than desired In each cut off lengt h , about 1.5 mm wrapper is pulled more than required. So if no arrangement is done to prevent this , after some time , wrapper pannels will be out of order.To prevent this problem,paper registeration system is has been applied.

On the wrapper,aft er every cu t off length there is a black mark (25mm X 5mm). There is a seaner eye which contains a photodiode , whenever t he black markp passes in fret of the photodiode, its cir cuit breaks. There is a swich which is ON when the black mark passes in front of the photo-dbode. This swich is controlled by a cam cam installed on the shaft of the rotary knife. The signal given by the rotary-knife photo diode and the sigbal given by the cam operated swich are in phase. Whenever the wrapper pannal is out,of timingsof photo diode and the swich axe out of phase and paper registra-tion motor gets ON. This motor applies breaks (mechanically) through wor m and gear to the paper pulling and cutting system.

The paper registration motor is ON for as long as the two signals are out of phase i.e as long as wrapper pannal is cut. In this way way, the extra length pulled is compensated.

ix) No biscuit , no wrapper :- There is a light source and a photo cell on the track through which biscuits pass. Whenever biscuit biscuits pass between the source and receiver, the signal is cut-off. The electric signal goes to solinoid swich which creats a magnetic feild which pulls a lever. As the lever is pulled, the cluch which is held by the lever moves. This allows the whole of the cutting and wrapping system to move.

When there is no biscuits in the track, the id circuit is not cut-off and the lever doesn't moveand consequently no wrapper is cut. Hence this system eliminates the wastage of wrapper.

x) Heaters :- There are a total of 7 heaters in the machine for sealing of wax coated wrapper.

Pre heaters	- 2	150 Watt
Side heaters	- 3	250 Watt
Rear heater	- 1	850 Watt
Top heater	- 1	850 Watt

These heaters are made up of brass

xi) cooling plates :- After passing through heaters the packets of biscuits pass through cooling plates. These plates are hollow from in side and cold water (5^0C to 8^0C) constantly circulates through it them. There are a total of 12 cooling plates.

Top cooling plates - 3

Front cooling plates - 7

Rear cooling plates - 2

The purpose of passing the packets through these cooling plates is to freeze the wax so that packets are made air tight.

3. DELIVERY ZONE :- This zone includes delivery chain which has 19 links. This chain takes the packets of biscuits out of the machine.

Apart Apart from these components, the machine has many other accessories, like revised counter for no. of packets, Speed of the machine etc.

TRAINING

INTRODUCTION :-

Ever y orgination needs the services of trained persons for per fo rming the ac t ivities in a systematic way. The fast changing technological devolpment makes the knoledge of employees obsolete. They require constant taking to cope with the needs of jobs. After selecting the employees, the next task of management is to give them proper training. Some employees may have previous knoledge of jobs while others may entirely be new. Both types of workers will need some kind of training to acquaint themselves with the jobs thfough it is necessary for the later kind of workers

MEANING :-

Training is an organised procedure for increasing the knoledge and skill of people for a specific purpose. The trainees require a new skill, technical knoledge, problem solving ability, etc. It also gives an awareness of the rules and procedures to guide thier behaviour. Training improves the performance of employees on present jobs and prepares them for the taking new assignments in future.

NEED AND IMPORTANCE OF TRAINING :-

i) Training improves the performance of employees. Increased skill and efficiency results in better quality and quantity of production.

ii) A trained worker will hahdle machines carefully and will use the materials in an economic way.

iii) A trained worker derives happiness and job satisfaction from his work. He feels happy when his performance is upto the mark.

iii) Degree of supervision required for a trained worker will be less. He will not depend upon the supervisor and may carry his work himself

iv) Untrained workers may waste more material,damage machines and equipment and may cause accidents. A trained worker will know the art of operating the machine properly.

v) A trained worker will be more adaptable to change than an untrained one.

vi) training also helps in the devolpment of employees. It helps in locating talent in them and then devolping it to the maximum.