

# MEANING IN PRODUCTS

SPECIAL PROJECT REPORT

BY  
N.PRASAD

GUIDE  
Prof U.A.ATHAVANKAR

APRIL 1989

INDUSTRIAL DESIGN CENTRE  
INDIAN INSTITUTE OF TECHNOLOGY  
BOMBAY 470 076



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APPROVAL SHEET

The Special Project titled 'MEANING IN PRODUCTS'  
By N.PRASAD is approved in partial fulfilment of the  
requirement for M.Des degree in Industrial Design

Signature

A handwritten signature in dark ink, appearing to be 'N. Prasad', written over the 'Signature' label.

Guide

Date 13-1-89

Acknowledgement

I sincerely thank Prof. U.A.Athavankar for his valuable guidance and encouragement throughout this project.

I also sincerely thank all concerned faculty, staff and my class mates for their kind help extended in this project.

N.PRASAD



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## INTRODUCTION

A child with the assistance of its parents starts recognising things surrounding him. He starts developing his own vocabulary and within a short duration starts identifying the objects correctly..He can recognise a car as a car, a cow as a cow, a TV as a TV, a shop selling ice cream etc. The children of these days are even smarter, they are able to operate a TV, tape recorder, VCR etc. which were unheard off by an adult some 15 years ago.

If a child can recognise the day to day objects correctly, even in the time when more and more new objects are being introduced, we can judge the capacity and capability of the human brain. It associates different meanings to different objects and helps to differentiate clearly between two types/ two class/ two families of objects.

The number of products that are being introduced in the market are increasing day by day. These products aimed at satisfying the basic and other higher needs - even some to satisfy a very trivial need of the human being. People are able to clearly identify the product itself or atleast recognise the class/ family to which the product belongs.

The degree to which the product is recognised depends on several factors - value system, cultural background, relationship with



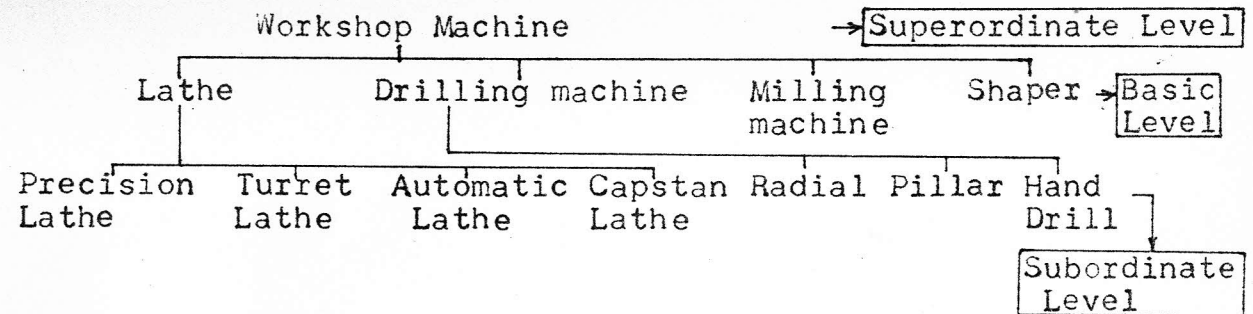
the product, environment and such other demographic and psychographic factors related to the person recognising the product.

The human brain recognises some of the typical elements pertaining to a product and forms a mental picture - a symbol - a semantic code. Products sharing or having typical elements are automatically grouped into a category. Visually it is the audio, visual and sensory information (generally called attributes) projected from the product which are used to categorise /predicts in a group.

One of the concepts of categorisation deals with arranging related products along a line. The product which are considered to represent that category most ideally is placed at the centre of the line. This product is also known as the 'CORE PRODUCT'. The other products sharing the attributes or belonging to that category are arranged on either sides. The distance at which the other products are located from the centre depends on the type and number of attributes being shared with the core product. The more the number of attributes being shared the closer it will be to the core product. Along the line after some distance a product may start sharing lot more attributes with some other product. This gives us the boundary until which the products are associated with the first category of products.

In case of new products the product which comes into existence first becomes the core product. With the introduction of another product satisfying the same need or performing the same function in a better way, the emphasis will shift from the old product to the new product. This is as good as shifting the core itself. Which in turn shifts the boundary also.

A model of categorisation deals with spreading of the products in a system along vertical and horizontal dimensions. Here the products are grouped at different levels. An example will clearly explain the model.



In the given example the precision Lathe, turret Lathe, Automatic Lathe and Capstan Lathe share a lot of attributes, these are placed in the subordinate level, but all are linked to the machine lathe in the basic level. Since Lathe, Drilling machine, Milling machine etc. share a few attributes they are grouped together in the Basic level. However all the machines are linked to the workshop machinery in the super ordinate level. As one goes vertically upwards the number of attributes shared goes on reducing. The relationship along the vertical dimension i.e. the relationship between Super-ordinate. Basic and Subordinate levels - gives the inter relationship among different products.



## OBJECTIVE OF THE PROJECT

The world will be a very dull place to live in if all the products - in every home, industry, street - were identicle and resembled the core product. It is the work of the designer to bring about changes in the products at regular intervals. The designer is left with two choices.

1. Design products without considering the categorisation or belongingness of a product to a particular family. This would lead to an environment where products doing the same function or satisfying the same need will appear differently - a really varied and confusing environment.
2. To understand how people categorise products into families using semantic coding by this he will get to know the boundary surrounding the core product. The products near is boundary still shares the attributes or belongingness with the core product. To bring about interesting changes in products, he has to make a conscious design effort to stretch the boundary or shift the core.

If the designer wishes to adopt the second choice, he has to know the relationship of the subordinate level and superordinate levels. With the Basic level to understand the belongingness and deviations in them.

2

This project deals with some of the experimental methods  
devised to understand peoples perception of product classes  
in their day to day life and how they categoring the products  
with the help of semantic features.

## METHODOLOGY

In the project two experimental methods were adopted.

STAGE-1 : Recognition of subordinate, superordinate and basic levels from photographs having details edited out of a complete product by different subjects - To find out component-product - product category relationship.

STAGE -2 : Cross checking the answers provided in stage-1 with the help of eye movement recorder to relate the subjects articulation with visual elements. To evaluate the Product from the point of view of quality.



## STAGE -I

### PRELIMINARY WORK :

A few superordinates were listed down and products belonging to their category were identified. Some products were rejected as they did not have sufficient visual information. The products choosen can be classified as given below.

| <u>SUPERORDINATE LEVEL</u>  | <u>BASIC LEVEL</u>           | <u>SUBORDINATE LEVEL</u> |
|-----------------------------|------------------------------|--------------------------|
| 1. Workshop Machinery       | Drilling Machine             | Portable Hand drill      |
| 2. Kitchen Appliance        | Beverage Making M/c          | Tea Making Machine       |
| 3. Electrical Appliance     | Electric Iron                | Automatic Steam Iron     |
| 4. Home Appliance           | Stitching Machine            | Sewing Machine           |
| 5. Electronic Product       | Measuring Instru-<br>ment    | Oscilloscope             |
|                             | Entertainment<br>Electronics | Portable Stereo          |
| 6. Visual Display<br>System | Projection System            | Slide Projector          |

The criterion for the selection of the above products were

- a) Products in our daily life - Sewing Machine or  
Home environment Automatic Iron
- b) New Product (in the Indian context) - Tea Making m/c.
- c) Products with details - Portable stereo  
Oscilloscope
- d) Products with ambiguities- Portable hand drill

The selected products were photographs. Black and White photographs were taken in order to eliminate the clues given by colours.

The important visual elements (detail) in the above products were selected. Areas of definite size incorporating those visual elements were marked. In one product 3 to 4 such areas were selected. The detail selected did not give any sense of scale.

The selected areas were recopied to a convenient size (45 mm x 60 mm) giving emphasis to clarity and sharpness of the image. If graphics were present the photo was printed reverse to minimise readability.

#### PROCEDURE

SUBJECTS A set of 5 subjects belonging to different engineering backgrounds were chosen. They were briefed about the experiment and their role in it.

Before conducting the experiments with the actual subjects a set of 28 photographs were shown to 4 people and trial runs were made. This was done to get a feel of the proper order of arranging photographs having details derived out of the same product. In each trial run the order or sequence of arrangement was changed. The trial run also helped in identifying photographs which gave away clues about the

product in the earlier stage. Generally the arrangement was from part to a whole. 4 photographs were rejected as they gave away clues early or had repeated visual elements.

The experiment was conducted in the following steps.

1. The photographs were arranged in a proper order such that the subject could not get a clue that more than one photograph or detail belonged to the same product. These photographs were numbered and the sequence of arrangement was noted down. The subject was shown one photograph at a time and was asked to identify the product to which the detail in the photograph belonged. No prompting was done in this step. All the photographs were shown and the answer given were documented. The photographs which the subject could not identify or associate with any product were noted.
2. The subjects were supplied with a list of hints of super ordinate level. The photographs which were not identified in the first run were shown one by one and the subject was asked to relate the belongingness of the product to a particular product category in the given list.

The lists of the hints supplied to the subject were

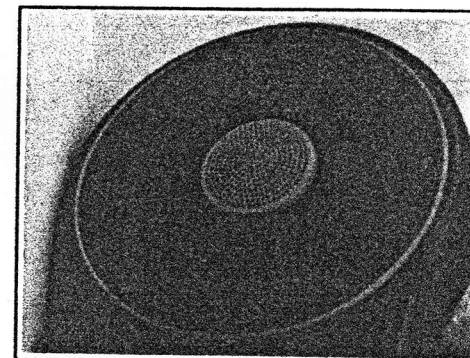
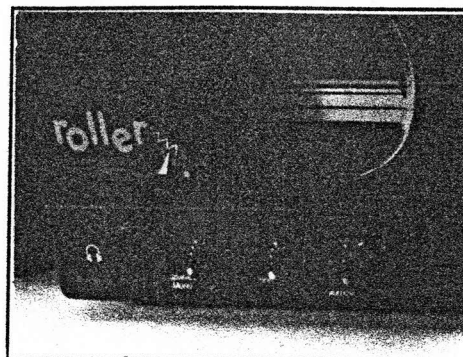
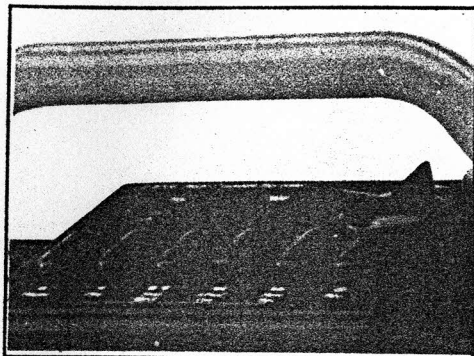
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|--------------------------|--------------------------|
| a. Home appliance        | g. Furniture             |
| b. Tools                 | h. Automobile            |
| c. Electronic product    | i. Machinery             |
| d. Electrical appliances | j. Toys                  |
| e. Personal Products     | k. Photographic products |
| f. Kitchen appliance     | l. Instrument.           |

The answers given by the subject were tabulated.

3. If the subject was able to identify the belongingness to a particular super ordinate level, he was asked to identify the basic level. If he was unable to identify then he was shown a photograph containing more details/ visual information of the same product (zoomed out) and then asked to identify the product or its basic level.
4. After all the three runs were over for one subject. The photographs were shown to him in the same order and asked to give reasons which prompted him to give the answers, in each of the cases, or specifically the features of the detail which made them associate it with a particular product. The feed back was documented.

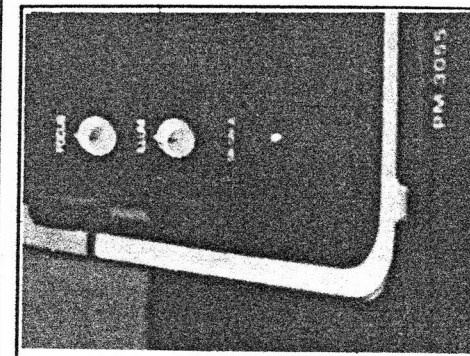
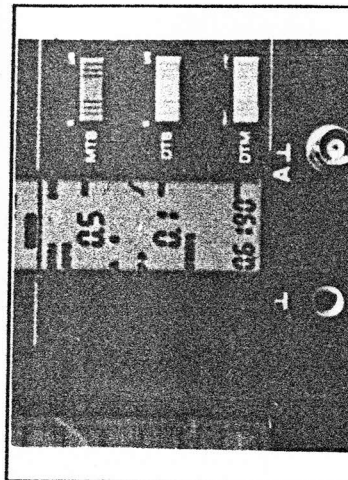
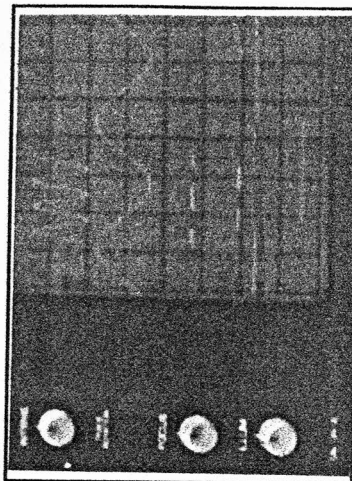
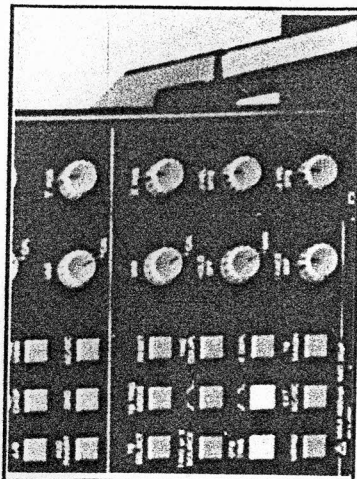
The steps (1) to (4) were repeated with the other subjects. Each time the order of the photograph arrangement was changed. The answers and feedback of each subject was documented.



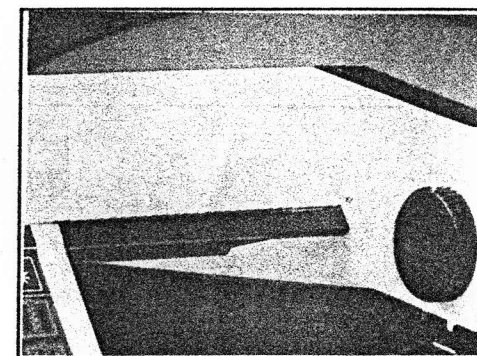
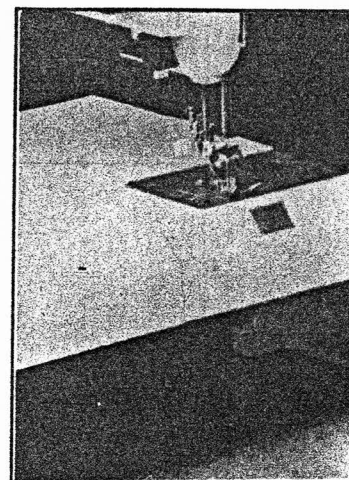
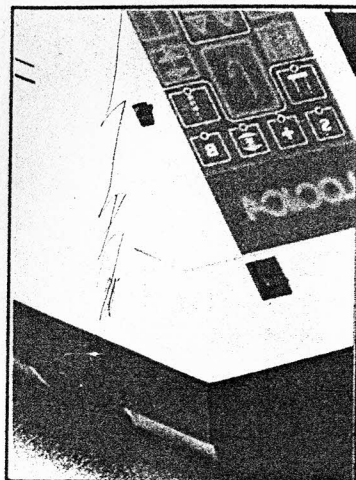


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|-------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| SUBJECT - 1 | VERY SOPHISTICATED ELECTRONIC IRON<br>(HANDLE, KNOBS AND SWITCHES)                          | WALKMAN, STEREO, MONO PLAYER<br>(A PHILLIPS PRODUCT, AN U S A<br>PRODUCT)                                                                        | SMALL SPEAKER - CAR SPEAKER<br>(CIRCULAR SHAPE, THE GRILLE)                                                                                      |
| SUBJECT - 2 | HOME APPLIANCE, UTILITY PRODUCT                                                             | WALKMAN<br>(GRAPHIC FOR HEAD PHONES,<br>ADJUSTMENTS FOR TONE, VOLUME,<br>MONO/ STEREO. THE WAY ROLLER IS<br>WRITTEN)                             | AIR BLOWER, SPEAKER<br>(FORM)                                                                                                                    |
| SUBJECT - 3 | TAPE RECORDER KEY BOARD<br>(KNOBS AND HANDLE FOR CARRYING)                                  | SPEAKER AND CONTROL BUTTONS OF A<br>RADIO OR TRANSISTOR<br>(THE CONTROL KNOB SHAPES. CANNOT<br>SEE THE NEEDLE USED TO ADJUST THE<br>FREQUENCIES) | A SPEAKER OR HAIR DRYER<br>(THERE IS ONE MORE SPEAKER ON THE<br>OTHER SIDE, SEEMS INCOMPLETE, ANY<br>OTHER ORIENTATION SEEM TO BE<br>UNBALANCED) |
| SUBJECT - 4 | TAPE RECORDER OR WALKMAN<br>(CONTROLS FOR FAST FORWARD,<br>REWIND, STOP AND PROBABLY EJECT) | INSTRUMENT<br>(SOCKETS - I/P, O/P & HEAD PHONE<br>GRAPHIC)                                                                                       | ELECTRIC MOTOR<br>(MESH - USED FOR AIR INLET)                                                                                                    |
| SUBJECT - 5 | CONTROL PANEL OF WALKMAN<br>(CONTROL GRAPHICS - FF, REW & PLAY)                             | SPEAKER OF A OLD RADIO - BOX TYPE<br>SPEAKER<br>(CIRCULAR OPENING AND KNOBS AT<br>THE BOTTOM)                                                    | SPEAKER OF A TAPE RECORDER<br>(PHILLIPS, LATEST SPEAKERS - GO TELL<br>THE WORLD OF PHILLIPS)                                                     |

ORIENTATION ↓

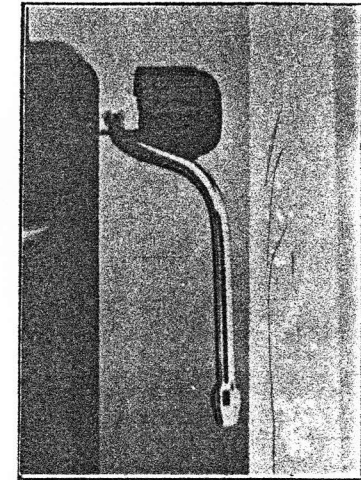
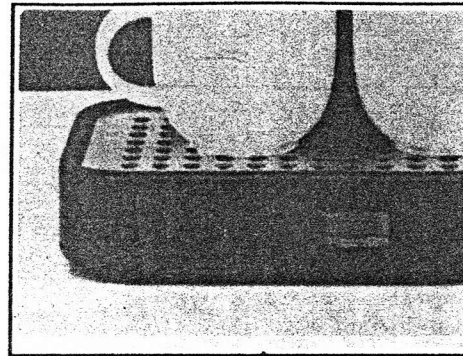
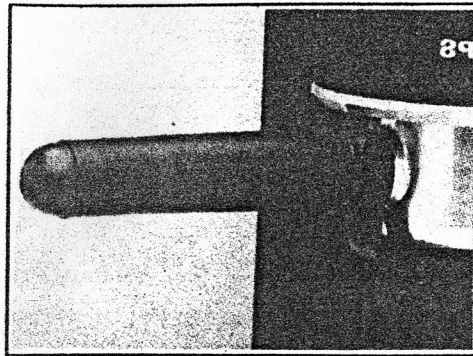


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| SUBJECT - 1 | <i>ELECTRONIC INSTRUMENT<br/>SIMULATOR OF SOME KIND<br/>( KNOBS, SWITCHES AND<br/>GRAPHICS )</i>                              | <i>ELECTRO CARDIOGRAPH<br/>( THE DISPLAY ON THE<br/>SCREEN MAY BE FOR<br/>COMPARISON )</i> | <i>A RADIO OR TIMER DEVICE<br/>( GRAPHICS - RADIO AND<br/>FREQUENCY<br/>TIMER - MINUTES, DATE<br/>AND TIME )</i>     | <i>ELECTRONIC EQUIPMENT<br/>( KNOBS AND FORM )</i>                  |
| SUBJECT - 2 | <i>INSTRUMENT CONTROL PANEL<br/>OSCILLOSCOPE<br/>( THE STAND AND THE KNOBS )</i>                                              | <i>OSCILLOSCOPE<br/>( THE DISPLAY ON THE<br/>SCREEN )</i>                                  | <i>PANEL OF AN INSTRUMENT<br/>( DISPLAY AND CONTROLS )</i>                                                           | <i>OPTICAL INSTRUMENT<br/>( GRAPHICS - FOCUS )</i>                  |
| SUBJECT - 3 | <i>A KEY BOARD HANGING IN<br/>THE AIR OR ATTACHED TO<br/>THE WALL.<br/>( THE HANDLE GIVES THE<br/>IMPRESSION OF HANGING )</i> | <i>OSCILLOSCOPE<br/>( THE SCREEN, KNOBS AND<br/>THE WAVE FORMS ON THE<br/>SCREEN )</i>     | <i>AN INSTRUMENT USED TO<br/>MEASURE SOMETHING<br/>RESEMBLES AN<br/>OSCILLOSCOPE<br/>( CONTROLS, DIGITAL METER )</i> | <i>AN INSTRUMENT LIKE OSCILLOSCOPE<br/>( KNOBS, HANDLE, STAND )</i> |
| SUBJECT - 4 | <i>OSCILLOSCOPE<br/>( GRAPHICS - HOLD, X - Y AXIS<br/>CONTROL, ON - OFF )</i>                                                 | <i>OSCILLOSCOPE<br/>( SCREEN )</i>                                                         | <i>OSCILLOSCOPE<br/>( THE SCREEN AND THE<br/>CURVES ON IT )</i>                                                      | <i>OSCILLOSCOPE<br/>( FOCUS CONTROL )</i>                           |
| SUBJECT - 5 | <i>OSCILLOSCOPE<br/>( KNOBS AND CONTROLS )</i>                                                                                | <i>OSCILLOSCOPE<br/>( SCREEN )</i>                                                         | <i>OSCILLOSCOPE<br/>( SCREEN )</i>                                                                                   | <i>OSCILLOSCOPE<br/>( GRAPHICS )</i>                                |



|             |                                                                                                                                                                       |                                                                                                                                                           |                                                                                                      |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| SUBJECT - 1 | SOLAR CALCULATOR<br>(THE CONTROL PANEL UNDERNEATH A THIN PROTECTIVE FILM)                                                                                             | STICHING MACHINE<br>( STICHING NEEDLE, THE PLATE UNDER THE NEEDLE LOOKS LIKE THE PLATE IN A NORMAL SEWING MACHINE )                                       | A KITCHENITTE<br>( KNOB - CONTROLLING INLET AND OUTLET )                                             |
| SUBJECT - 2 | MEMBRANE SWITCH ON A CONTROL PANEL<br>( PANEL AND GRAPHICS )                                                                                                          | SEWING MACHINE , WIRE SAW                                                                                                                                 | ELECTRONIC INSTRUMENT<br>( SMALL PORTION OF THE PANEL SEEN )                                         |
| SUBJECT - 3 | KE'Y BOARD , PART OF A TESTING EQUIPMENT . FEATHER TOUCH KEYS - DO NOT PROTRUDE .<br>( GRAPHICS - HOLES INTO WHICH PROBES CAN BE INSERTED )                           | SEWING MACHINE , PLOTTER - HIGHLY SOPHISTICATED TO PLOT VERY THIN LINES.<br>( NEEDLE - SEWING MACHINE PLOTTER APPLICATION - TO DRAW THIN LINES ON P C B ) | AN ELECTRONIC PRODUCT<br>( THE KNOBS, GRAPHICS )                                                     |
| SUBJECT - 4 | PNEUMATIC DEVICE - NO IT'S AN ELECTRONIC EQUIPMENT USED FOR HEATING<br>( FEATHER TOUCH CONTROL PANEL, TYPICAL FUNCTIONS LIKE 'S', +. FINE AND COARSE CONTROL BUTTON ) | SEWING MACHINE<br>( NEEDLE AND SEWING ARRANGEMENT )                                                                                                       | ELECTRONIC PRODUCT DEALING WITH HEATING<br>( THE GRAPHIC SHOWS THE SYMBOL OF RESISTANCE & THE KNOB ) |
| SUBJECT - 5 | AN ELECTRONIC PRODUCT, PART OF A LAB EQUIPMENT, NOT A DOMESTIC PRODUCT<br>( FEATHER TOUCH / PROXIMITY CONTROLS )                                                      | SEWING MACHINE<br>( NEEDLE AND SEWING ARRANGEMENT )                                                                                                       | FEATHER TOUCH CONTROL PANEL OF AN ELECTRONIC PRODUCT.<br>( FEATHER TOUCH CONTROLS )                  |

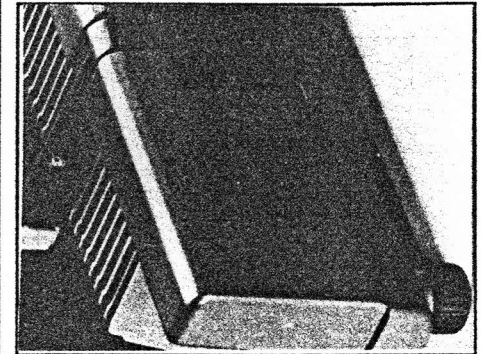
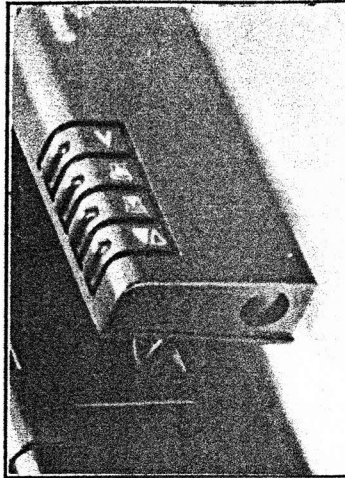
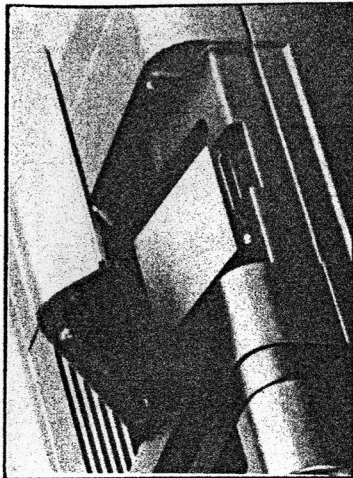




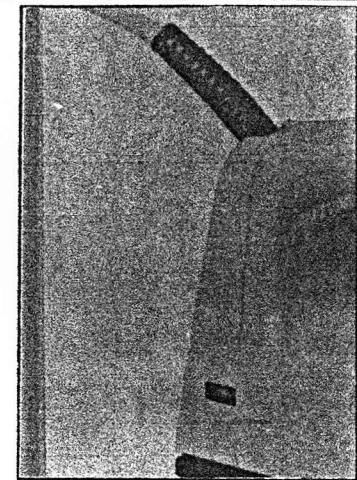
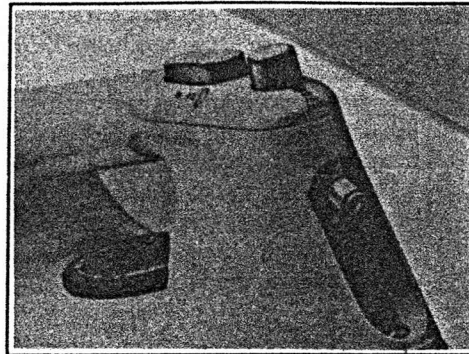
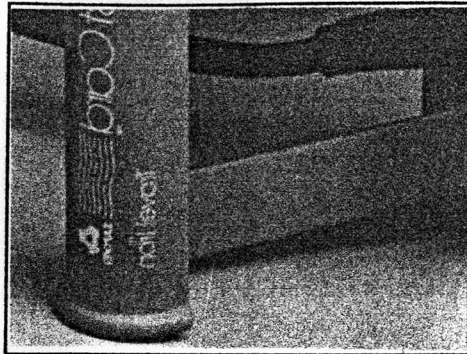
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| SUBJECT - 1 | LIPSTICK, CLUTCH LEVER OF A SCOOTER<br>( ACCELERATOR - SOLID PORTION GIVES<br>THE IMPRESSION OF A FRAME )                      | JUGS KEPT ON A KITCHEN SIEVE<br>A KITCHEN APPLIANCE<br>( JUGS - HOLES IN THE SIEVE )                                                                                            | CONSUMER ELECTRONICS ( RADIO,<br>TRANSISTOR, TURN TABLE )<br>( KNOB AND HANDLE OF A TURN TABLE )                  |
| SUBJECT - 2 | KITCHEN APPLIANCE<br>( HANDLE - CONNECTED TO A VESSEL )                                                                        | A TRAY FOR HOLDING CUPS - STEAM BATH<br>( CUPS )                                                                                                                                | TAP, FAUCET<br>( HANDLE CONNECTED TO A VESEL )                                                                    |
| SUBJECT - 3 | LIPSTICK, OUTLET OF SOME CONTAINER<br>( LIPSTICK - SHAPE, AN OUTLET WITH<br>A SMALL HOLE FOR A FINE FLOW FROM<br>A CONTAINER ) | A TRAY WITH HEATING CIOLS BELOW,<br>A CONTAINER TO KEEP PLATES - OPENABLE<br>( CUPS - BOTTOM IS A TRAY, HOLES<br>IS FOR SHOW, COIL MAY NOT BE TOUCHING<br>TO ALLOW HEATED AIR ) | WASH BASIN TAP, INFRA RED SENSOR<br>( KNOB AND NOZZLE - TAP )                                                     |
| SUBJECT - 4 | SENSOR / PROBE USED FOR SOME<br>MEASUREMENT<br>( SPHERICAL PART AT THE END )                                                   | LOOKS LIKE CUPS, HEATER TO KEEP<br>SOMETHING WARM<br>( CUPS- A HEATER BENEATH THE HOLES )                                                                                       | SOMETHING USED IN LATHES, A HANDLE<br>TO TIGHTEN OR LOOSEN<br>( KNOB WITH A HANDLE BAR FOR MANUAL<br>ADJUSTMENT ) |
| SUBJECT - 5 | HANDLE OF A CAMERA STAND<br>( SHAPE, FORM<br>GRAPHICS - A PHILLIPS PRODUCT )                                                   | WATER DRAINER<br>( PORES / HOLES )                                                                                                                                              | WASH BASIN TAP, MICROPHONE,<br>DOOR KNOB, SLIDE PROJECTOR<br>( KNOB )                                             |



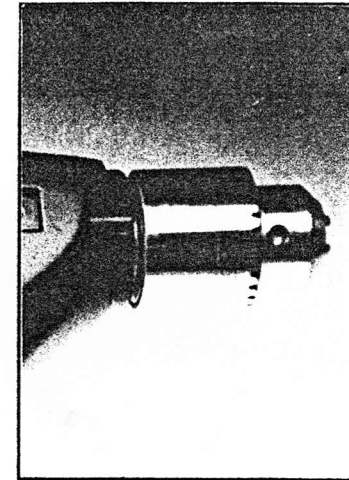
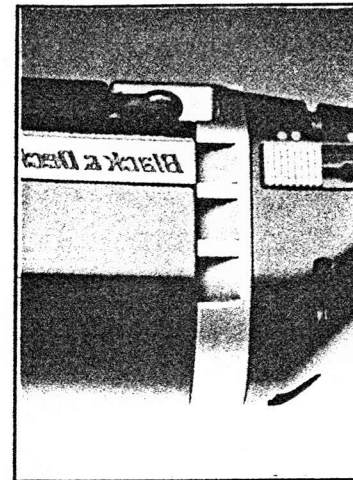
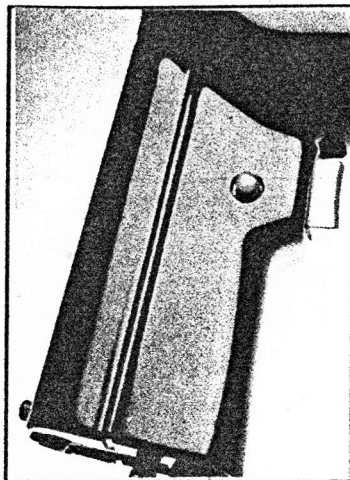
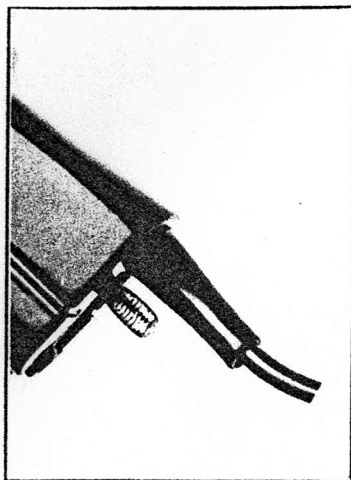
ORIENTATION ↓



|             |                                                                                    |                                                                                              |                                                                                                                      |                                                                                    |
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| SUBJECT - 1 | PART OF A TYPEWRITER OR A CAMERA<br>( INTERNAL STRUCTURE )                         | POCKET TRANSISTOR<br>( SHAPE - THIN, HAND HELD TYPE )                                        | LENS OF A CAMERA - BUT FOR THE THREADING - KNURLING*<br>( THE FRONT HOLE , THREADING DOES NOT SOUND RIGHT )          | ROOM HEATER<br>( RIBS - GRILLE )                                                   |
| SUBJECT - 2 | PHOTOGRAPHIC PRODUCT<br>( RECEPTACLE FOR A PAPER OR FILM )                         | CONTROL FOR SOME MOVING PART, HAND HELD CONTROL<br>( GRAPHICS INDICATE CONTROL OF MOVEMENT ) | SLIDE PROJECTOR<br>( PROJECTOR LENS )                                                                                | SLIDE HOLDER IN A SLIDE PROJECTOR<br>( RACK TO KEEP THE SLIDES )                   |
| SUBJECT - 3 | A MECHANICAL PRODUCT<br>( PART OF A MACHINE CONTINUING ON BOTH SIDES )             | BACK SIDE OF A SINGLE CASSETTE PLAYER.<br>( WIDTH AND CONTROLS )                             | CAMERA FIXED ON WALL<br>( LENS )<br>AN INLET FOR AN IMMERSION HEATER TO A RECTANGULAR CONTAINER<br>( THREADED HOLE ) | A TRANSFORMER<br>( THE CORE OF THE TRANSFORMER OVER WHICH THE COIL IS WOUND )      |
| SUBJECT - 4 | COMPUTING DEVICE, CALCULATOR - PROGRAMMABLE<br>(A STORAGE SPACE FOR MEMORY CARDS ) | PNEUMATIC CONTROLS<br>( PRESS BUTTONS AND THE GRAPHIC ON THE CENTRAL TWO BUTTONS )           | VACCUM CLEANER<br>( THREADED CONNECTION )                                                                            | SLIDE PROJECTOR<br>( SLOTS TO KEEP THE SLIDES )                                    |
| SUBJECT - 5 | CAMERA , BATTERY CASE<br>( LOOKS LIKE THE ROLL LOADING COMPARTMENT )               | ELECTRONIC PRODUCT - A PORTABLE EQUIPMENT<br>( HAND HELD PART )                              | CAMERA<br>( LENS OF A CAMERA, THERE IS A KNOB AT THE TOP - CLICK BUTTON )                                            | BACK SIDE OF A POWER PACK<br>( THE SLITS INDICATE THE RESEMBLANCE TO A HEAT SINK ) |



|             |                                                                                                      |                                                                                            |                                                                                       |
|-------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| SUBJECT - 1 | POWDER CONTAINER                                                                                     | ELECTRIC IRON - SOPHISTICATED<br>( GRIPPING HANDLE, KNOBS AND<br>ELECTRICAL SOCKET )       | FRIDGE, ELECTRIC TOASTER<br>( SOCKET, SHAPE, SIZE - IMPRESSION OF<br>A TOASTER )      |
| SUBJECT - 2 | <i>ELECTRICAL APPLIANCE<br/>( CHORD )</i>                                                            | IRON BOX, PRESS IRON<br>( THERMOSTAT CONTROL FOR TEMP )                                    | HAND HELD TOOL, SANDER, IRON BOX<br>( FORM - GRIPPING BY HAND )                       |
| SUBJECT - 3 | AN ELECTRICAL CHORD BEHIND CERTAIN<br>STOOL LEGS<br>( VERTICAL MEMBERS RESEMBLE<br>A STOOL )         | ELECTRIC IRON - FRONT<br>( THE SHAPE , THERMOSTAT CONTROL<br>MOISTURE CONTROLLER - STEAM ) | ELECTRIC IRON, ELECTRIC TORCH<br>( CHORD - ELECTRIC IRON<br>- A TORCH BEING CHARGED ) |
| SUBJECT - 4 | <i>ELECTRICAL APPLIANCE - SOMETHING<br/>TO DO WITH TRAVELLING<br/>( ELECTRICAL CHORD, GRAPHICS )</i> | ELECTRIC IRON<br>( THE TEMPERATURE ADJUSTMENT<br>DIAL, PRESS BUTTON TO LET OUT<br>STEAM )  | VACUUM CLEANER<br>( ELECTRICAL CONNECTION )                                           |
| SUBJECT - 5 | <i>ELECTRICAL PRODUCT ( CHORD )</i>                                                                  | IRON BOX<br>( TEMPERATURE CONTROL DIAL<br>STEAM OUTLET )                                   | IRON BOX<br>( POWER CHORD )                                                           |



|             |                                                                                                                              |                                                                               |                                                         |                                                                                                             |
|-------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| SUBJECT - 1 | A CIGARETTE LIGHTER<br>( PRESENCE OF A KNOB AND A<br>FLAME OUTLET )                                                          | PART OF A TAPE RECORDER<br>OR TAPE DECK<br>( GRAPHICS - BLACK & <u>DECK</u> ) | WHISTLE OF A COOKER<br>( THE NOTCHES )                  | ELECTRIC IRON<br>( PART OF THE HANDLE ,<br>A SECTION TAKEN AT THE TOP )                                     |
| SUBJECT - 2 | A HAND HELD TOOL<br>( SWITCH AND CABLE )                                                                                     | HAND TOOL<br>( FORM AND NAME )                                                | CHUCK OF A DRILL<br>( CHUCK TO HOLD A DRILL BIT )       |                                                                                                             |
| SUBJECT - 3 | ELECTRIC LIGHTER<br>( THE SHAPE OF A CIGARETTE<br>LIGHTER IN THE CHARGING<br>STAGE, THE KNOB IS TO<br>ACTIVATE THE LIGHTER ) | TOP OF A SEWING MACHINE,<br>CONTROLLER OF A PLOTTER<br>( TAPERING FORM )      | A DIE - DIE PRESS<br>HAIR DRYER - FRONT<br>( THE FORM ) | HAIR DRYER, ELECTRIC GUN<br>( HAIR DRYER - TOP HOLE FOR<br>AIR OUTLET<br>ELECTRIC GUN - FORM AND<br>SHAPE ) |
| SUBJECT - 4 | ELECTRICAL APPLIANCE<br>( ELECTRICAL CHORD )                                                                                 | DRILL<br>( CONICAL FRONT, LOCKING<br>KEY )                                    | DRILL<br>( CHUCK TO HOLD THE DRILL<br>BIT )             | ELECTRICAL APPLIANCE<br>( ELECTRICAL CHORD GOING<br>OUT AND A SMALL ELECTRIC<br>BULB )                      |
| SUBJECT - 5 | ELECTRICAL APPLIANCE<br>( ELECTRICAL CHORD )<br><br>POWER CHORD OF AN IRON                                                   | SUITCASE / BRIEFCASE<br>( KEYHOLE TO OPEN AND<br>KNOB TO PRESS )              | DRILLING MACHINE<br>( CHUCK OF A DRILLING<br>MACHINE )  | NOT AN INDUSTRIAL PRODUCT<br>( THE FINISH IS TOO GOOD<br>FOR AN INDUSTRIAL PRODUCT )                        |



| Product               | Association at<br>super ordinate<br>level                                                    | Association at<br>Basic level                                     | Association at<br>Subordinate<br>level                                                               | Inference                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Portable<br>Stereo | Electronic Product<br>Home appliance<br>Utility Product                                      | Instrument                                                        | Tape recorder<br>Walkman stereo<br>Monoplayer<br>Radio<br>Transistor<br>Air blower<br>Electric motor | Here maximum number of<br>times the subjects<br>could relate the<br>product to an electronic<br>product at super or<br>ordinate level and<br>some of the products<br>related to were also<br>close i.e. they were<br>audio products or<br>entertainment electronic<br>products. This gives<br>us more insight to the<br>basic level of the<br>product. |
| 2. Oscillo-<br>scope  | Electronic<br>Product                                                                        | Measuring Instru-<br>ment.<br>Optical<br>instrument<br>Instrument | Oscilloscope<br>Radio<br>Electronic timer<br>ECa<br>Simulator                                        | The subjects could<br>clearly associate the<br>product generally as<br>an electronic product.<br>This is also evident<br>from their association<br>only with other elect-<br>ronic products.                                                                                                                                                           |
| 3. Sewing<br>machine  | Electronic<br>Product<br>Kitchen equipment<br>Testing equipment<br>Not a domestic<br>product |                                                                   | Sewing Machine<br>Solar calculator<br>Wire saw                                                       | A product which was<br>confused totally with<br>an electronic<br>product. The elements<br>which contributed<br>were the Feather touch<br>controls, the graphics,<br>the sleekness of the<br>product, the switches<br>and the way the differ-<br>ent planes meet-form<br>finish.                                                                        |



4. Tea making machine      Kitchen appliance  
                                  Consumer electronics

5. Slide projector      Photographic product      Computing device  
                                  Mechanical product      Hand held control  
                                  Electronic portable  
                                  equipment

6. Electric steam iron      Electrical appliance  
                                  Hand held  
                                  tool

Wash basin  
 Door knob  
 slide projector  
 Cup heater  
 Part of a lathe  
 Microphone  
 Turn table  
 Kitchen sieve  
 Camera stand

The importance of association of the product with the user subject to evident in this case. Since a tea making machine has not yet become popular in Indian homes, one could identify the product in the subordinate and Basic level.

Slide projector  
 Camera  
 Battery case  
 Calculator  
 Pocket transistor  
 Cassete player  
 Room heater  
 Power pack  
 Vacuum cleaner

Slide projector involves - Mechanical system-slide movement  
 Optical system-lens and projection.  
 Electronics-Remote control.  
 The subjects could independent by relate or identify these parts at the super ordinate level. The ruggedness of the form also made them relate it to a mechanical product.

Iron box  
 Electric Iron  
 Sander  
 Electric torch  
 Vacuum cleaner  
 Toaster  
 Electric heater

The flexible rubber taping provided to minimise stresses on cable or chord entering the product was the major visual feature in categorisation of electrical product. The subjects could in general relate it to a domestic product due to the form and finish -clean look.

7. Portable     Hand held  
hand drill     tool  
                 Electrical  
                 appliance  
                 Not an  
                 Industrial  
                 Product

Drill  
Drilling m/c.  
Cigarette  
lighter  
Electric lighter  
Tape recorder  
suit case  
Sewing m/c.  
Hair c. yer  
Cooker whistle  
Electric Iron

This product was in  
general recognised as  
a domestic product or  
a home appliance.  
The good form fine  
finish with very  
minute details were  
responsible for the  
above categorisation.  
The subjects were  
unable to relate  
the product as an  
Industrial product.

## ANALYSIS - Superordinate level

The features which made the subjects categorise products into super ordinate levels are discussed below.

### 1. An Electronic Product :-

- a. Knobs- Rotary, push button- A number of them
- b. Sockets - Input and output connections.
- c. Handle - for portability
- d. Stand - for table mounting and giving a tilt to the product.
- e. The form and finish of the knobs- Knurlings on the knobs.
- f. A display - CRT, digital display
- g. Graphics - pictorial representations corresponding to the function of the control was easily recognised.
- h. The overall form, finish, the treatment of corner and edges.
- i. Membranes with feather touch or presume sensitive control panel under a thin protective film
- j. A transparent window
- k. Snug fit push button switches closely following the form of the product.

### 2. An Electrical product

- a. Flexible tubing provided to reduce the stresses or electrical chord where it enters the product.

- b. Rotating knob with knulings to facilitate fripping
- c. The form - free flowing, soft,
- d. Switches - toggle
- e. Pilot lamps - Indicators - small bulbs. Neon lamp etc.

3. Photographic Product

- a. Complicated internal structure
- b. Reflective surfaces - flat
- c. An enclosure with a snug fitting lid and fine details for locking.
- d. The circular lens
- e. Knobs
- f. Rugged looking form
- g. Fine details - parallel running grooves
- h. Surface finish
- i. Graphics.

4. Kitchen appliance

- a. Stainless steel parts - clean looking
- b. Handles attached to the body of the product - form of the handle - long extending - circular cross section
- c. Other utensils used in conjunction
- d. Smooth, soft forms - spherical, cylindrical



### OBSERVATIONS

1. The subjects were relating the products and its details in 1:1 scale if the actual scale was not obvious.
2. The subjects were not only concentrating on the details visible in the photograph but was trying to visualise the whole product form by taking clues from the edges corners and radii in the photograph.
3. The details which gave 2D information in the photograph made the subjects to guess the other dimension before coming with an answer.
4. The non homogeneity or discontinuity in form a combination of soft and hard forms in the same product was difficult to comprehend by some subjects.
5. The Graphics plays a very vital role in associating a meaning to a product. If the form did not give any clue the subjects searched for a clue from the graphics.
6. The subjects could clearly identify the material used in different parts of the product viz. metal, plastic, rubber etc.
7. The subjects were able to relate products to different environments like laboratory, home, industry depending on the form, finish and very fine details.
8. The surface contour of the part of a product which comes

in contact with the hand( for lifting, gripping, transferring and holding the product) was easily recognised.

9. Repeatedly occuring identicle looking members (Holes, grooves etc.) were associated with a grille. These grille were associated with flow of heat and fluids.
10. The knurlings on a part of a product were associated with sliding, moving or rotating members of the product.

## STAGE-II

### EYE MOVEMENT AND ITS RELAVANCE

The human eyes voluntarily and involuntarily fixate on those elements of an object which carry or may carry essential and useful information. The more information contained in an element, the longer the eyes stay on it. The distribution of points of fixation on the object changes depending on the purpose of the observer. i.e. depending on the information which he must obtain, for different information can usually be obtained from different parts of an object. The order and duration of the fixations on elements of an object are determined by the thought process accompanying the analysis of the information obtained.

The thought process of the subject is influenced by putting a question to him before or during observation of the object. A recording of the eye movement will help in analysing the visual information corresponding to the thought process going on in the subject.

The eye movement recording has become a powerful tool in marketing to see the effectiveness of advertisement and package designs. It is also used extensively in defence and psychological studies.

The eye movement recording in this project helps us to

deduce the visual elements in a product which made the subject decide that the detail being shown is a part of a particular product. In the stage-I we had to depend on the subjects articulation to know why he felt so. Some times the subject cannot articulate the reason why he had categorised that product. The eye movement recording will eliminate the above problem. Here the fixations of the eye on particular elements of a product for long durations directly helps us to infer how the subject identified the product.



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