

AN EVALUATION OF THE EFFECTIVENESS  
OF THE OVERHEAD PROJECTOR IN  
TEACHING CLOTHING CONSTRUCTION

Thesis for the Degree of M. A.  
MICHIGAN STATE UNIVERSITY  
Judy Yaryan Stam  
1964





Q 26-72 864  
10 25-70 157



## ABSTRACT

### AN EVALUATION OF THE EFFECTIVENESS OF THE OVERHEAD PROJECTOR IN TEACHING CLOTHING CONSTRUCTION

by Judy Yaryan Stam

The purpose of this study was to investigate the effectiveness of the overhead projector in teaching selected clothing construction techniques to a beginning clothing construction class at Michigan State University.

The sample was the 91 students enrolled in the course. The experimental design included teaching pattern layout, set-in sleeves and garment closures to a control group by classroom demonstration and to an experimental group by the overhead projector method during the laboratory period. Each group consisted of three laboratory sections.

The Median Test was used to measure the difference in CQT Percentile Scores and Reading Percentile Scores between the control group and the experimental group.

The hypothesis--the overhead projector presentations of clothing construction techniques will be as effective as the classroom demonstrations--was tested by analyzing scores from a pre-test taken prior to the presentations, a post-test given immediately following the presentation and a retention test administered the last laboratory period. Analysis of covariance was used to test for significant differences in change of



knowledge and retention of learning between the control group and the experimental group.

Student reactions to teaching methods were obtained through a free response reactionnaire.

Based on evidence presented in this limited research the following conclusions were drawn:

1. The overhead projector presentations of selected clothing construction techniques were as effective as the classroom demonstration presentations on the basis that there were no significant differences in change of knowledge and retention of learning between control and experimental groups.
2. The overhead projector presentations were equally effective with large and small classes. The overhead projector made it possible for all the students to see the presentations with equal clarity.
3. Visuals are especially helpful in teaching clothing construction. The overhead projector was an effective media, but need not be the only method of presentation.
4. The overhead projector was an accepted instructional aid. The experimental group preferred the overhead projector method to the demonstration method.
5. "Seeing the presentation" was the most often mentioned advantage of the overhead projector, although some students found it difficult to transfer learning from the abstract media to practical application.

Copyright by  
JUDY YARYAN STAM

1964

AN EVALUATION OF THE EFFECTIVENESS  
OF THE OVERHEAD PROJECTOR IN TEACHING  
CLOTHING CONSTRUCTION

By

Judy Yaryan Stam

A THESIS

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF ARTS

Department of Textiles, Clothing and Related Arts

1964



## ACKNOWLEDGMENTS

Appreciation is expressed to all who have assisted in making this study possible.

Special recognition is due to Dr. Mary L. Gephart for her understanding and guidance during the researcher's graduate program and suggestions in the writing of this thesis; graduate committee members for their assistance throughout the study; the Audio-visual Department for processing the overhead projector visuals; beginning clothing construction instructors for their cooperation and assistance in data collection; Evaluation Services for consultation on methods of analysis; the Singer Sewing Machine Co., Coats and Clark Inc., Simplicity Pattern Co., Talon Inc., and University of Nebraska Cooperative Extension for use of teaching materials; and the researcher's husband, Jerome, for his encouragement.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS . . . . .	ii
LIST OF TABLES . . . . .	v
 Chapter	
I. INTRODUCTION . . . . .	1
Statement of Problem	
II. REVIEW OF LITERATURE . . . . .	4
Theory of Visuals	
Attitudes of Teachers Toward Visuals	
Overhead Projector	
Findings of Studies	
Various Uses of the Overhead Projector	
Focus of the Study	
III. METHODOLOGY . . . . .	25
Design of Study	
Course Used in the Study	
Population	
Development of Instruments	
Development of Visuals	
Methods of Presentation	
Administration of Instruments	
Methods of Analysis	
IV. ANALYSIS OF DATA . . . . .	38
Analysis of Test Scores	
Comparison of Control and Experimental Groups	
Testing the Hypothesis	
V. REACTIONS OF STUDENTS TO TEACHING METHODS . . . . .	45
Control Group Reactionnaire	
Experimental Group Reactionnaire	
Summary of Reactionnaires	

Chapter	Page
VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . . .	54
Summary	
Conclusions	
Recommendations	
BIBLIOGRAPHY . . . . .	58
APPENDIX A . . . . .	63
Pattern Layout Pre-test	
Pattern Layout Post-test	
Set-in Sleeves Pre-test	
Set-in Sleeves Post-test	
Garment Closures Pre-test	
Garment Closures Post-test	
Retention Test	
APPENDIX B . . . . .	91
Pattern Layout Transparency Copies	
Set-in Sleeves Transparency Copies	
Garment Closures Transparency Copies	
APPENDIX C . . . . .	142
Pattern Layout Presentation Outline	
Set-in Sleeves Presentation Outline	
Garment Closures Presentation Outline	
APPENDIX D . . . . .	148
Control Group Reactionnaire	
Experimental Group Reactionnaire	
APPENDIX E . . . . .	151
Pattern Layout Frequency Distribution Table	
Set-in Sleeves Frequency Distribution Table	
Garment Closures Frequency Distribution Table	
Retention Test Frequency Distribution Table	



## LIST OF TABLES

Table	Page
1. The range, mean, median, mode, and standard deviation on pattern layout, set-in sleeves, garment closures, and retention test scores for the control and experimental groups . . . . .	39
2. Regression coefficients: based on prediction variables and test data . . . . .	43

## CHAPTER I

### INTRODUCTION

#### Statement of Problem

Larger enrollments are placing a premium on more efficient and effective teaching methods in today's schools. As classes grow larger, time-honored methods of teaching, while still used, are giving way to methods that benefit the greatest number. Instructors are being challenged to teach 100 students in subject matter traditionally taught to 15-20 students. "Redeployment of teachers, students, time and space, as in team teaching, is one way of meeting the problem of enlarged enrollments. Extensive use of audio-visual equipment, such as the overhead projector, is another."<sup>1</sup>

The United States Army Command and General Staff College found ". . . that when one must teach an ever increasing amount of material more effectively in a given time frame, one turns to audio-visual aids."<sup>2</sup> Kidd states, "Aids are needed for more effective teaching of large classes."<sup>3</sup>

---

<sup>1</sup>R. Lee Rocheleau, "A Team Teacher Bears Witness," Audiovisual Instruction, II (April, 1962), 205.

<sup>2</sup>Major W. C. Washcoe, "The Versatile Overhead Projector," Educational Screen, XXXII (May, 1953), 242.

<sup>3</sup>Kenneth P. Kidd, "Dynamic Aids for Teaching Math," Educational Screen and Audiovisual Guide, XXXVIII (March, 1959), 131.

Comparatively little attention has been given to the development of an audio-visual program at the university level.<sup>4</sup> Though many university instructors are aware that audio-visual aids would make teaching more effective, they have limited themselves to showing commercially prepared materials.

Conversely, the freedom of university teaching lends itself to individually prepared instructional materials. Evidence has shown "the material of learning determines to a high degree how much is learned within a given period of time or the length of time necessary for given learning."<sup>5</sup> "Why then, should a university instructor not develop his own instructional materials to fit his specific instructional needs?"<sup>6</sup>

The purpose of this study is two-fold:

1. to develop materials to fit a specific instructional need.
2. to determine the effectiveness of the instructional materials and teaching method in a large university class.

The following chapter contains Review of Literature. Chapter III will discuss the methodology of the study. Chapters IV and V will be concerned with the evaluation of the effectiveness of the overhead

<sup>4</sup>Jerrold E. Kemp, "Producing Transparencies for College Instruction," Educational Screen, XXXVII (June, 1958), 280.

<sup>5</sup>John Guy Fowlkes, "A Partnership in Learning Materials," Educational Screen and Audiovisual Guide, XL (August, 1961), 393.

<sup>6</sup>Kemp, op. cit., p. 280.



projector by statistical analysis and student reactionnaires. The last chapter includes the summary, conclusions and recommendations of the study.

## CHAPTER II

### REVIEW OF LITERATURE

The National Academy of Visual Instruction was founded in 1920. Educators investigated the possibility of teaching with motion pictures in the early 1920's, and by 1929 sound films were being produced specifically for schools. During the 1930's and 1940's, modern communication tools were recognized as a means of improving group instruction. But educators were not convinced of their value until World War II when the armed forces, suddenly faced with teaching tasks of staggering proportions, effectively carried through a program of learning, using sensory materials.<sup>7</sup> Instructional tools, the fastest growing aspect of today's education, portends the greatest potential in the history of audio-visual.<sup>8</sup>

#### Theory of Visuals

Audio-visual instruction is the term used to designate an extensive variety of devices used by teachers to transmit ideas and experiences through the senses.<sup>9</sup> Although all senses are involved in learning, the

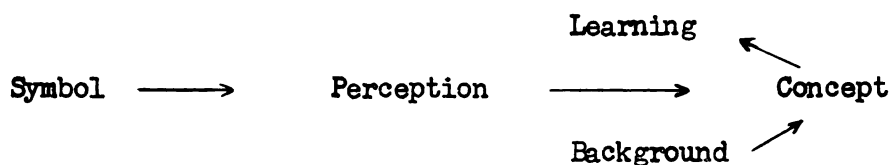
---

<sup>7</sup>Edgar Dale, Audio-Visual Methods in Teaching, Revised. (New York: Dryden Press, 1954), 62.

<sup>8</sup>William B. Sanborn, "Our Future Stake in Instructional Tools," Educational Screen and Audiovisual Guide, XXXVIII (December, 1959), 639.

<sup>9</sup>F. Dean McClusky, "A Definition," Audio-Visual Teaching Techniques (Dubuque, Iowa: Wm. C. Brown Co., 1949), 1.

largest number of impressions is received through the eye. An individual perceives best through the eye, retains the perception longer and is inclined to create a mental picture for future recall. Memory by association requires accurate and almost universally recognized graphic symbols. "A picture is not only 'worth a thousand words'; right or wrong, it makes an indelible impression upon the mind."<sup>10</sup>



As shown diagrammatically by the sketch, a symbol perceived by the eye leads to concept and concept to actual learning. Since visual symbols are so efficacious, the concepts produced will vary in accuracy in direct relation to the accuracy of the symbol. One's interpretation of a visual device is profoundly influenced by ability and background. "Wrong concepts may produce negative and deleterious results. An error in concept is a breakdown in communication."<sup>11</sup> Drawings must be simple, correct, free from any possible ambiguity, must grow out of the visualist's intuition and knowledge of his audience, and must be evaluated in terms of produced results.

Mannino found that when two senses--sight and sound--are stimulated at the same time, mental impressions are received more quickly, retained longer and received more easily.<sup>12</sup>

---

<sup>10</sup>Wilfred L. Veenendaal, "The Visualization of An Idea," Audio-visual Instruction, II (December, 1957), 260.

<sup>11</sup>Ibid.

<sup>12</sup>Philip Mannino, ABC's of Visual Aids and Projectionist Manual (State College Pennsylvania: M. O. Publishers, Box 406, 1953), 3.

The following claims by the research of Hoban, Finn and Dale support the fact that audio-visual materials when properly used in the teaching situation can accomplish the following:

- . . . supply a concrete basis for conceptual thinking and hence reduce meaningless word responses of students.
- . . . have a high degree of interest for students.
- . . . offer a reality of experience which stimulates self-activity on the part of pupils.
- . . . develop a continuity of thought.
- . . . make learning more permanent.
- . . . contribute to growth of meaning and hence to vocabulary development.
- . . . provide experiences not easily obtained through other materials.
- . . . contribute to the efficiency, depth and variety of learning.<sup>13</sup>

Bachman states audio-visual materials are useful as experiences for the foundation and re-orientation of learning.<sup>14</sup> The researches of educational investigators confirm the findings that audio-visual materials in teaching can provide as much as 300 percent more effectiveness in student learning than by verbal explanation alone with a reduction of more than 13 percent in teaching time.<sup>15, 16, 17</sup>

---

<sup>13</sup>Dale, op. cit., p. 65.

<sup>14</sup>John W. Bachman, How To Use Audio-Visual Materials (New York: Association Press, 1959), 7.

<sup>15</sup>Eric F. Burtis and Jame E. LeMay, They See What You Mean (Johnson City, New York: Ozalid, Division of General Aniline and Feline Corporation, 1959), 18.

<sup>16</sup>Lester B. Sands, Audio-Visual Procedures in Teaching (New York: The Ronald Press Co., 1956), 10.

<sup>17</sup>Washcoe, op. cit., p. 242.

Dale explains that "all teaching can be greatly improved" when audio-visual materials are seen in their relationship to teaching as a whole and to the learning process as a whole.<sup>18</sup> The instructor must always remember, however, that visual aids do not supplant teaching; visual aids merely supplement teaching to make it better.

### Attitudes of Teachers Toward Visuals

The realization is rapidly growing that attitudes are probably more determinative of behavior than mere cognitive understanding of an aspect of our environment. A rating scale Kelley constructed of teachers' attitudes toward audio-visual materials by means of the Thurstone technique endorsed this realization. The rating scale consisted of 22 attitude statements regarding audio-visual materials ranging from very positive to very negative. The statements and a background data sheet were distributed to 995 instructors, kindergarten through college. Chi-square tables were set up for comparison between background and statements checked. Factors having a .01 significance relationship between teachers' attitudes and audio-visual materials were:

encouragement of various supervisors in the school system; frequency with which audio-visual materials were used in classroom; ease of ordering materials; amount of available equipment; frequency with which audio-visual materials were used by fellow teachers; grade level at which teacher works; type of learning experience the teachers have had during their training; ease of room darkening, availability of electric outlets, screens, chalkboards and bulletin boards; sex (women have a more positive attitude); and poor condition of materials.

---

<sup>18</sup> Dale, op. cit., p. 3.

Factors having .05 significant relationship between background and teachers' attitudes toward audio-visual materials were:

college course in audio-visual and training in production of materials; age; and years of formal education.

The most significant factor in teachers' attitudes toward audio-visual materials was encouragement of supervisor and the least significant factor was an audio-visual director in the school.<sup>19</sup>

Home economists were encouraged to use audio-visual materials when Dorothy Lyle said, "I personally feel that one of the greatest needs of the profession today is a well-planned and co-ordinated visual aids program."<sup>20</sup>

Though NEA researchers in 1956 found 40 percent of the teachers lacking in know-how of audio-visual materials,<sup>21</sup> researchers believe attitudes to be more important in determining the use of audio-visual materials than both knowledge about materials and skill in their use.<sup>22</sup>

### Overhead Projector

The overhead projector was virtually unknown until World War II and not until the end of that war did the overhead projector find widest use in armed services' classrooms where this visual device is now standard

<sup>19</sup> Gaylen B. Kelley, "A Study of Teachers' Attitudes Toward Audio-visual Materials," Educational Screen and Audiovisual Guide, XXXIX (March, 1960), 118-121.

<sup>20</sup> Dorothy S. Lyle, AHEA Blueprint for Progress, Cleveland, Ohio, June 27, 1961.

<sup>21</sup> Anna L. Hyer, "The Horns of the Dilemma," Audio-visual Instruction, II (December, 1957), 284.

<sup>22</sup> Kelley, op. cit., p. 121.

equipment. Although a respected tool for a number of years, the overhead projector has suddenly loomed into prominence the last several years because: modern instructional programs are making unprecedented demands for teaching materials and tools that are simple to use; new transparency making techniques and quick copy have been developed; and the adaptation of plastic lens reduced the weight and increased the illumination of the overhead projector.<sup>23, 24</sup>

### Definition of Terms

A list of definitions to be used in this study in relation to the overhead projector are:

Overhead projector--A device which throws a highly illuminated image on the screen by reflection from a mirror. It is placed in front of the audience and may be used in a semi-darkened or completely lighted room. The projector utilizes  $3\frac{1}{4}" \times 4"$ ,  $7" \times 7"$  and  $10" \times 10"$  transparencies and specially prepared objects which may be produced and presented in a variety of ways.

Transparency--Transparent materials designed for projection to facilitate enlargement of the image. Originally associated with  $2" \times 2"$  and  $3\frac{1}{4}" \times 4"$  slides, the term is now more popularly associated with  $7" \times 7"$  and  $10" \times 10"$  slides used with overhead projectors.

Slides--A mounted transparency of either  $2" \times 2"$  or  $2\frac{1}{4}" \times 2\frac{1}{4}"$ . One of  $7" \times 7"$  or  $10" \times 10"$  proportion is commonly called a transparency and is designed for use with an overhead projector.

Mask--A frame of cardboard or other substance used to confine the picture area of slides or transparencies and to give support to the projection material in the slide.

---

<sup>23</sup>Tool of the Times," Audio-visual Instruction, VII (April, 1962), 201.

<sup>24</sup>Allan Finstad, "A Quick Method For Transparencies," Audio-visual Instruction, II (January, 1957), 18.

Diazo--A contraction of Diazonium; the chemical compound used in the family of ammonia developing reproduction papers, clothes and films. These materials reproduce anything written, drawn or printed on a translucent or transparent material when exposed to ultra-violet light and developed in ammonia fumes.<sup>25</sup>

### Characteristics of the Overhead Projector

"All of the many visual communication methods are valuable and each is especially suited to one or more specific communication situations. Among them, however, is one method of visual presentation that offers outstanding versatility and opportunity: the overhead projector."<sup>26</sup> The overhead projector is one of the most significant developments in still projection because the desirable characteristics of all projected visuals--attractiveness and group visibility--can be fulfilled, plus other desirable characteristics which will be discussed on the following pages.

#### Face Audience

The instructor works at the front of the class, enabling him to face his audience, maintain eye contact and measure reaction of the class. One difficulty may arise if a high stand for the overhead projector is used: the instructor and the machine may block the screen for students in the front and center of the room. The difficulty may be eliminated by reseating students, using a lower stand, or installing a tilted screen.

---

<sup>25</sup>Audio-Visual Communication Review, XI, No. 1 (1963), pp. 45, 52, 58, 62, 72, 75, and 81.

<sup>26</sup>Burtis, op. cit., p. 13.



### Identity With the User

The audience sees the visualization from the same point of view as the instructor. When the instructor writes or points to something on the projector stage, the screen image of the hand or pointer is seen as if each member of the audience were writing or pointing. This is called the "subjective" viewing angle; "Each viewer automatically identifies himself with the communicator and the subject because of his angle of vision."<sup>27</sup> Research in the teaching of manipulative skills with the motion picture shows that learning is much greater when the action has been photographed from a subjective point of view. The viewer "has a subjective viewing angle" when the overhead projector is used; therefore, the effectiveness of the visualization is greatly increased.<sup>28</sup>

### Large Image

The effectiveness of any projected image depends upon adequate image brightness and visibility to all in the classroom. The overhead projector presents a large, clear image in a lighted room, visible to all.

### Lighted Room

Since a 1000 watt bulb eliminated the need for blackout curtains, transparencies can be vivid, clear, lifelike, and easy to project in a lighted room. In a lighted room students can take notes on what they see and hear; the instructor can watch the reaction of the class and move from one station to another, possibly using other visual aids in the presentation without having to adjust the lights.

---

<sup>27</sup>Burtis, op. cit., p. 17.

<sup>28</sup>Ibid.

## Flexibility

The unfixed sequence of presentation in using the overhead projector is especially advantageous as the instructor is not bound to a rigid order. If an advanced question arises, the appropriate frame may be selected and the sequence changed; or if a statement is not clear to the student, the instructor can repeat on the overhead projector. Television and movies do not have the flexibility found in the overhead projector. Also, the overhead projector is flexible because the instructor and students can fashion the learning materials to their particular classroom needs. "When this is accomplished, materials become an integral part of a teaching learning process in which those concerned are participants more and recipients less."<sup>29</sup>

## Time

Interesting subject presentation employing two senses at the same time without lost motion makes easier impressions.<sup>30</sup> In experimentation with a graduate course in bacteriology, Kemp found fewer questions were asked during presentation, and class time taken to explain the visualized subject matter was significantly less. A quiz revealed that more students gained a broader understanding of the concepts presented and grasped more details than had previous groups.<sup>31</sup>

The time required for teaching is reduced because the explanation is seen as well as heard. Conservation of a teacher's time in the classroom enables him to develop other desirable points.

---

<sup>29</sup>Gene Udell, "Transparencies for Learning," Audio-visual Instruction, II (June, 1957), 168.

<sup>30</sup>Mannino, op. cit., p. 4.

<sup>31</sup>Kemp, op. cit., p. 281.

## Materials

A disadvantage of the overhead projector is the difficulty of obtaining materials.<sup>32</sup> Transparencies of commonly-used maps, charts, grids and forms for social studies, mathematics, language arts, accounting, physical education, and music are commercially available. Also available are sets of projectuals for teaching geometric constructions, biology, general chemistry, new mathematics, United States history, world history, current events, and driver education. These projectuals are supplemented by instructional manuals and resource materials. There seems to be no available materials for any field in home economics.

If materials cannot be purchased, there are two techniques of making transparencies: the homemade method and the photographic method. In constructing homemade transparencies, the visual is broken down into parts "thought by thought, according to the outline" and a separate drawing of each step is made in proper relationship to the rest so that the resultant transparencies will fit together like a jig-saw puzzle.<sup>33</sup> With overlays, a completely new concept of instruction was opened by the gradual build-up of a situation by super-imposition.<sup>34</sup> Overlays on phases of a process are prepared on separate sheets of tracing paper and aligned with the base drawing. Overlays work particularly well with developmental presentations.<sup>35</sup> Transparencies are prepared from translucent copies by

---

<sup>32</sup>Kenneth B. Haas and Harry O. Packer, Preparation and Use of Audio-Visual Aids (3rd ed., New York: Prentice Hall Inc., 1955), 87.

<sup>33</sup>Veenendaal, op. cit., p. 262.

<sup>34</sup>Haas and Packer, op. cit., p. 86.

<sup>35</sup>Horace Clay Hartsell and Wilfred L. Veenendaal, Overhead Projection (Buffalo, New York: Henry Stewart Inc., 1960), 5.

bringing the original tracing paper in contact with ammonia sensitive diazochrome film.<sup>36</sup>

An unique development in connection with the overhead projector is the use of polarized light to create an effect of animation on projected transparencies.<sup>37</sup> Therefore, the opportunity an instructor has of developing instructional materials to fit a specific instructional need seems unlimited.

An asset of the overhead projector is that the ideas and thoughts of an experienced and capable instructor can be stored and used again and again. As a result an instructor feels justified in using time to develop permanent materials. Carefully planning for large group presentations improves quality of material content.<sup>38</sup>

#### Personalized Presentation

The user of the overhead projector controls the situation; he is not a machine operator while a standardized visual presentation is made, but a communicator with the help of the projector.<sup>39</sup> With some materials, such as films, and with some resources, such as visits to community agencies, the instructor tends to be replaced for a time. However, with transparencies and the overhead projector the exact opposite is true as the instructor is in the front of the room working constantly with the

<sup>36</sup>Kemp, op. cit., p. 281.

<sup>37</sup>W. Wittich and C. F. Schuller, Audio-Visual Materials (New York: Harper and Row Publishers, 1962), 339.

<sup>38</sup>Rocheleau, op. cit., p. 205.

<sup>39</sup>Burtis, op. cit., p. 17.

students.<sup>40</sup> The instructor keeps a central role as he operates his own visuals. The overhead projector is mechanically simple and can be operated without assistance.

The overhead projector permits the instructor to refer directly to significant features on a transparency, to add overlays while developing complex processes and to pace the lesson as he employs the machine. A presentation becomes more personalized when the instructor masters the mechanics of producing transparencies for himself, instead of using commercially prepared transparencies.

#### Cost

Figuring the cost per student per day and the cost of the transparencies, Ray's study of classroom costs in the Rockford Illinois Public School system showed that a teacher should make a transparency in advance if he would need more than one minute to put something on the chalk board.<sup>41</sup> Rocheleau of San Diego considers the initial cost of the overhead projector negligible when the cost of preparing fresh materials for presentation is considered.<sup>42</sup>

The United States Navy has evaluated cost in operation in this statement: "Materials for the overhead projector are easier and/or cheaper to prepare than are those for 2" x 2" or 3½" x 4" projectors, but are more expensive and difficult than materials for the opaque projector."<sup>43</sup>

<sup>40</sup> James Brown, Richard Lewis and Fred Harclerod, Audio-visual Instructional Materials and Methods (New York: McGraw-Hill Book Co. Inc., 1959), 438.

<sup>41</sup> Peers Ray, "Thumbnail Testimonials," Audio-visual Instruction, VII (April, 1962), 227.

<sup>42</sup> Rocheleau, op. cit., p. 205.

<sup>43</sup> Personal letter from Michael B. Callahan, Head Training Aids Branch, Department of the Navy, Washington, D. C., July 13, 1964.

### Side Benefits

The school benefits from the use of the overhead projector because the instructors are better prepared for lessons and students receive better instruction. Some instructors gain much satisfaction from effectively teaching large groups of students.<sup>44</sup>

### Findings of Studies

No studies have been done concerning the effectiveness of the overhead projector in teaching clothing construction, but results of other studies, structured and unstructured, will be reviewed.

In Snyder, Texas, three teams of teachers organized a creative search for new ways of increasing the quantity of learning and the quality of teaching in the secondary school. The project dealt with new approaches to general science, biology and eighth-grade English. The tested hypothesis was: "Teaching the same students in large groups (70-100) part of the time and in small groups (12-15) and individually the remainder of the time is more economical of both money and teacher time and more productive educationally than the methods usually associated with teaching classes of 25 or 30."<sup>45</sup> Use was made of closed circuit TV, radio, tape recorders and overhead projectors with teacher made visuals. Results were as follows:

- (1) Students often understood small objects and microscopic materials better when magnified by TV than when individual microscopes were used;
- (2) material was presented more vividly;
- (3) higher degree of student interest eliminated

---

<sup>44</sup>Henry S. Bissex, "How Overhead Projection Aids Large Group Instruction," Educational Screen, XXXVII (May, 1958), 231.

<sup>45</sup>William O. Nesbitt, "Big Classes in Texas," Educational Screen and Audiovisual Guide, XXXVIII (November, 1959), 594.

discipline problem; (4) teacher energy was conserved and instruction was improved; (5) drill was more intense and absorbing due to ingenious, imaginative and effective devices; (6) overhead projector allowed for time-saving effective graphic presentations yet maintained student-teacher contact; (7) overhead projector enabled the teacher to face the class and proved more effective than the black-board; (8) students paid closer attention when electronic and mechanical aids were used; (9) lesson plans became a series of transparencies presenting the basic materials; (10) overhead projector allowed the teacher to develop a series of slides of his own ideas; (11) the use of color in the material projected by the overhead projector was of significant value; (12) evaluation of learning was efficiently and effectively done by the modern materials of learning; and (13) statistical results in all classes that used one or more of the instruments showed in all cases the pupils learned as much as previous students formerly did and in many cases the results showed superior learning.

The completed statistical analysis for 1957-58 indicated, within limits, "The amount of learning as measured by standardized tests that takes place in a classroom is not affected by the number of students present."<sup>46</sup> The study dealt with groups of 20-90 meeting every day of the school week. Cost analysis showed the school saved \$11,417 after clerical aid was paid.

An unscientifically controlled pilot experiment at Oriskany Central School in Oriskany, New York, used an overhead projector as the basic tool to teach beginning reading. At the end of the first year the Bond-Clymer-Hoyt developmental reading tests were administered to the three first grades. The score of the experimental group of 32 was 2.6 in reading; the average class was 2.3. More important was the fact that the experimental group did more reading outside of class.<sup>47</sup>

---

<sup>46</sup> Ibid., 594-596.

<sup>47</sup> George O. Story, "The Overhead Promotes Early Love of Reading," Audio-visual Instruction, VII (April, 1962), 216.

Instructors of sophomore students of English classes at Newton High School, Newtonville, Massachusetts, used the large group lecture and overhead projector to present that part of the course of study which did not require give and take discussion. The 85 to 150 students met once a week. Two-fold results showed pupils were more attentive and responsible for material that would not be taught again and "there is not a course that cannot be improved by the extensive preparation that overhead projection implies."<sup>48</sup>

The Technion, Israel Institute of Technology, faced with the problem of teaching approximately 450 students in basic mathematics, physics and chemistry, first resorted to closed circuit television as an answer to their questions: "How do you write on a blackboard in a manner visible to several hundred students filling a large auditorium? How do you demonstrate experiments so that they can be seen . . . over a wide area?"<sup>49</sup> But closed circuit television had these disadvantages: color television was expensive, the camera was bulky and a large technical staff was required to operate the equipment. Color films of chemistry courses were also available, but were unsatisfactory because they were static and not geared to the individual group or class.

The Israeli solution was the overhead projector. An angled mirror was mounted to the projector for horizontal projection onto the wall and experimental equipment was suspended vertically in the large focal plane of the projector. Miniaturized equipment was used to take up less space and

---

<sup>48</sup> Bissex, op. cit., p. 231.

<sup>49</sup> K. S. Spiegler, "Overhead Projector at Israel Tech," Educational Screen and Audiovisual Guide, XL (October, 1961), 536.



lessen the risk of explosions. Quantitative and qualitative experiments were shown by reducing the measurements to electrical signals and feeding them into a transparent meter which was projected with the equipment. The action of machinery was also shown by projecting transparent models with moving parts. In this way a class of several hundred followed with ease chemistry experiments and demonstrations.<sup>50</sup>

Miller, supervisor of accounting department at the Martin Van Buren High School in Queens Village, New York City, carried out an informal experiment from September 1961 to January 1962 by teaching accounting with approximately 150 transparencies and without a chalkboard. The results of the experiment were:

- (1) the classes maintained interest and attention; (2) the material was displayed in depth through projected transparencies; (3) the projected transparencies saved considerable time and effort during the lesson itself, but required extra time and effort beforehand for more careful lesson-planning and for preparation of the transparencies. Once prepared the transparencies can be used many times and may be readily revised; (4) the overhead projection permitted the teacher great flexibility in applying materials suitable to his methods and to class needs; (5) the dry process method of preparing transparencies was simple, convenient and economical; (6) overhead projection encouraged constant appraisal of methodology; and (7) the time and effort invested in preparing transparencies promoted a greater interest in lesson planning and resulted in more effective and rewarding teaching.<sup>51</sup>

#### Various Uses of the Overhead Projector

"At first the overhead projector was used almost solely in an organized program of mass instruction by the large-group lecturers and

<sup>50</sup> Ibid., 536.

<sup>51</sup> Morris Miller, "Transparencies Save Time For Accounting Teacher," Audio-visual Instruction, VII (April, 1962), 220-221.

was described as 'the basic mechanism of lecture support.'<sup>52</sup> Since then the overhead projector has been found to be as effective as it is adaptable. For teachers the applications seem endless; some of them are as follows:

The South Dakota School for the Deaf uses the overhead projector for teaching the slow learner to read, by simplifying and projecting the story for the slow group. "The primary teacher uses the overhead projector to teach speech by projecting the drawings of lips, tongue, and teeth formations for the different speech sounds."<sup>53</sup>

Schaeffer at Oriskany Central School in Oriskany, New York, saved the time required to correct 180 sets of mathematics papers each night by projecting the mathematics solutions on the screen and walking through the classroom checking papers while each student tried to discover his own errors.<sup>54</sup>

Pittsburg California Unified School District believes the overhead projector is a valuable aid for effectively presenting information and holding student attention in these ways: (1) science students saw crystals form on the screen as their instructor poured a saturated solution of copper sulfate in a petri dish and placed it over the projection stage; (2) LaMay, a mathematics instructor, found the greatest value of the overhead projector to be the time saved by not having to work on the blackboard and duplicate materials; (3) LaMay found overlays an excellent medium for

---

<sup>52</sup>William L. Winston, "Overhead Hits Stride On New Instructional Program," Audio-visual Instruction, VII (April, 1962), 203.

<sup>53</sup>Eugene F. Thomure, "New Potential for Teaching Deaf Children," Audio-visual Instruction, VII (April, 1962), 211.

<sup>54</sup>Story, op. cit., p. 217.

explaining binomial theorem; (4) the auto mechanics instructor showed all the essential parts of the car and their relationships; (5) the librarian used reproductions of actual cards; and (6) a ninth grade language arts instructor made transparencies of students' papers and projected them for class discussion with results that "students improved their papers and were looking for their own errors."<sup>55</sup>

In North St. Paul, Minnesota, the overhead projector is used regularly in modern language, world geography, biology, conservation, and English.

A first grade teacher in Maryland said, "The overhead projected visuals help me get through to the children because they let me focus the interest of the entire class on the specific point I'm discussing."<sup>56</sup>

Newton, Massachusetts, high school instructors use extensively the quick copy process that produces a finished transparency in four seconds to eliminate mimeographed materials. These instructors found step-by-step learning could be provided with correction and evaluation immediately following the testing period.<sup>57</sup>

At Hammonton High School, New Jersey, students do assignments on a transparency instead of the chalk boards.<sup>58</sup>

Instructors at the University of Delaware project English themes, music scores and football drills; use a dual screen and projector in

<sup>55</sup>Edgar Poe, "In Pittsburg, California, The Overhead Proves Its Adaptability," Audio-visual Instruction, VII (April, 1962), 206.

<sup>56</sup>"Mrs. Burroughs' Magic Pencil," Audio-visual Instruction, VII (April, 1962), 223.

<sup>57</sup>Winston, op. cit., p. 203.

<sup>58</sup>Ray, op. cit., p. 227.

teaching mathematics; combine sounds and symbols of sounds in music; and utilize the overhead projector and 8mm sound motion picture camera for speech.<sup>59</sup>

At the University of Nebraska poultry husbandry students are shown precisely how to take advantage of the angle of the sun's rays in planning and locating a poultry house by an overlay diagram. Breaking an egg into a clear glass dish on the light table of the projector made clear its composition. Business organization and management instructors use the overhead projector to compare and discuss different office procedures, organizational plans and business practices. The zoology department has replaced large charts with transparencies; the agronomy department uses a transparency with overlays in genetics and climatology and the silhouette of a real plant placed on the projector table is used for plant identification. The animal husbandry department demonstrates cuts of meat and their location with overlays; the department of mathematics uses the projector as a lighted chalk board in all large sections; the college of pharmacy uses a series of color-coded transparencies to teach nomenclature; the Dean of teachers' college uses the overhead projector in conferences and planning semester schedules; the University TV station uses the projector for a backdrop or background for a set; and at graduate seminars several departments require that students giving seminar papers plan and prepare transparencies to complement their presentation.<sup>60</sup>

---

<sup>59</sup>David V. Guerin, "The Overhead Projector at the University of Delaware," Audio-visual Instruction, VII (April, 1962), 214-215.

<sup>60</sup>Robert E. Stepp, "Inroads On The Campus," Audio-visual Instruction, VII (April, 1962), 211-213.

### Focus of the Study

Reported research shows the overhead projector has been successfully used in kindergarten through university classes. But no studies have been reported concerning the effectiveness of the overhead projector in teaching clothing construction. The aim of this study was to determine the effectiveness of the overhead projector in teaching specific techniques used in clothing construction.

The specific assumptions, objectives and hypothesis guiding this study are as follows:

#### Assumptions:

1. Transparencies for the overhead projector can be developed to explain the processes of selected clothing construction techniques.
2. The effectiveness of teaching methods can be measured by pencil and paper tests.
  - a. A pre-test will measure the present knowledge of clothing construction techniques.
  - b. An equivalent post-test immediately following a presentation will measure the change in knowledge.
  - c. An equivalent retention test given at the end of the term will measure the retention of knowledge.
3. Characteristics of the experimental group and the control group are comparable.

#### Objectives:

1. To develop a series of overhead projector transparencies explaining the processes of selected clothing construction techniques.
2. To compare the effectiveness of teaching clothing construction techniques by the use of the overhead projector with teaching clothing construction techniques by classroom demonstration.

3. To compare results of the test showing change in knowledge of the experimental group and the control group.
4. To compare the retention of learning of the experimental group and the control group at the end of the term.

Hypothesis:

1. The overhead projector presentation of clothing construction techniques will be as effective as the classroom demonstration presentation.

## CHAPTER III

### METHODOLOGY

In this study an alternative method of teaching certain aspects of clothing construction at Michigan State University was examined.

The methodology will be described in the following order: (1) design of study, (2) course used in study, (3) population, (4) development of instruments, (5) development of visuals, (6) methods of presentation, (7) administration of instruments and (8) methods of analysis.

#### Design of Study

The experimental design of the study involved the teaching of the same selected subject matter by the demonstration and the overhead projector methods to two groups of students, comparing the effectiveness of the media of instruction by measuring the change of knowledge and retention of learning.

#### Course Used in the Study

The beginning clothing construction course at Michigan State University (TRA 152) presents the principles of clothing construction showing the relationship of these principles to fit, style or design details, fabric handling, and garment assembling.<sup>61</sup>

---

<sup>61</sup>Michigan State University Catalog 1963-64, Undergraduate and Graduate Programs, (Michigan State University Publication), A-165.

The objectives of the course are:

1. Students gain an understanding of basic principles fundamental to all aspects of clothing construction and an ability to apply them.
2. Students develop an understanding of process and techniques of clothing construction and learn to evaluate them for specific end uses.
3. Students develop an ability to recognize and/or appreciate standards of clothing construction.<sup>62</sup>

The course consisted of two, one-hour lectures, and one, two-hour laboratory, per week. The lecturer presented the principles and specific techniques used in clothing construction. During the laboratory period students were given an opportunity to utilize the information in the making of a basic muslin and a simple cotton dress from commercial patterns. The emphasis of the course, however, was on a better working knowledge rather than completion of a beautiful garment.

#### Population

The population consisted of all students taking beginning clothing construction<sup>63</sup> at Michigan State University, spring term, 1964. Ninety-one students comprised the control group and experimental group.

No attempt was made to match students in each group. The only factors considered in dividing the six laboratory sections into a control group and an experimental group were: (1) familiarity of laboratory instructor with course, (2) room, (3) time of day, and (4) number of students in each section.

<sup>62</sup>Course Outline (TRA 152) Michigan State University, 1963-64

<sup>63</sup>Textiles, Clothing and Related Arts 152, referred to hereafter as TRA 152.



Familiarity of laboratory instructor with the course was taken into consideration. One staff member and one graduate assistant were teaching the course for the first time and for this reason they were placed in different groups. Two instructors were most familiar with the course, one of each of these instructors was included in each of the groups. In all, six laboratories were taught by six instructors.

Some of the instructors expressed a definite opinion that the two laboratory rooms had a distinct atmosphere. Sections were selected to prevent all three sections of either control or experimental group from meeting in the same room.

Instructors expressed the opinion that it would be best not to have all eight o'clock laboratory periods in one group as some students come late to laboratory and some may not be alert at this time.

The fourth consideration made to equalize the two groups concerned the number of students in each laboratory section.

The control group included laboratory sections I, IV and VI totaling 45 students. The experimental group consisted of laboratory sections II, III and V totaling 46 students.

When the majors of the students were combined the results were:

Major	Majors of students in control and experimental groups enrolled in TRA 152, spring term, 1964	
	Control	Experimental
Home Economics	38	39
Art Education	1	1
Business	1	1
Speech		1
Social Science		1
Music	1	
Bio-science	1	
Psychology	1	
Medical Technology	1	
No preference	1	
	<u>45</u>	<u>46</u>

There seemed to be no significant difference in the students' majors as the greatest number of students in the control and experimental groups was majoring in a field of home economics.

The number of students in each class level are as follows:

Class	Number of students in freshman, sophomore, junior, and senior classes in control and experimental groups	
	Control	Experimental
Freshman	29	25
Sophomore	3	12
Junior	9	8
Senior	4	1

Both groups were comprised mainly of freshmen; the experimental group had more sophomores than the control group and the control group had more seniors than the experimental group. No major differences in previous clothing construction experiences from 4-H, junior high, senior high, and home experience were apparent in the control and experimental groups:

Experiences	Number of students who gained experiences from 4-H, junior high, senior high and home sewing in control and experimental groups	
	Control	Experimental
4-H	8	7
Junior High	26	26
Senior High	20	19
Home Sewing	31	35

All of the students in the control group had used a sewing machine before but two of the students in the experimental group had never operated a sewing machine. Aside from this, the students' background in clothing construction work was similar.

The number of students who classified the presentations as a new learning are as follows:

### New Learnings

Number of students in control and experimental groups who classified pattern layout, set-in sleeves, slide fastener, attaching buttonholer, making machine buttonhole and sewing on a button with a thread shank a new learning

	Control	Experimental
Pattern Layout	4	8
Set-in Sleeves	14	15
Slide Fastener	12	13
Attaching Buttonholer	23	19
Making Machine Buttonhole	23	16
Sewing on a Button With a Thread Shank	17	24

The control group was less experienced in attaching the buttonholer and making the buttonhole than the experimental group, but more experienced in pattern layout and sewing a button on with a thread shank.

The cause for student enrollment in the course differed. The experimental group comprised a more captive audience:

Number of students in the control and experimental groups who were taking the course as a required course or as an elective

	Control	Experimental
Number required	33	42
Number elective	12	4
Percentage required	73	91
Percentage elective	27	9

### Development of Instruments

Tests were developed to measure the effectiveness of the overhead projector in teaching clothing construction techniques. Three tests were developed: a (1) pre-test to measure the present knowledge of beginning

clothing construction students, (2) post-test to measure the change in knowledge of students and (3) retention of knowledge test.

To broaden knowledge of beginning clothing construction, the researcher audited the course, (TRA 152) Fall, 1963, and assisted in the laboratory and the workroom, Winter, 1964.

Before constructing the test items, conferences were held with the lecturer of the beginning clothing construction class to discuss subject matter and visuals to be used in the presentations.

The three objective tests had multiple choice and matching items. An objective type test was chosen for ease in scoring with an inflexible key. The key was very important, as all of the instructors and graduate assistants involved in the course had to agree. Limited laboratory time allowable for testing made an objective type test most broad and practical for sampling of students' knowledge.<sup>64</sup> Also, an objective type test allowed for more thorough statistical analysis.

Objective test questions require considerable refinement to measure what is intended. The test items concerning pattern layout, set-in sleeves and garment closures were composed and distributed to a committee including the lecturer of the course, laboratory instructors and the researcher's graduate committee. The questions were reviewed for validity, plausibility of answers and readability. The test items were revised and distributed for refinement and approval (see Appendix A, p. 63).

---

<sup>64</sup> Clara Brown Army, Evaluation in Home Economics (New York: Appleton-Century-Crofts, Inc., 1953), 62.

## Scope of Content

The scope of content to be tested was the information taught or reinforced by visual aids. The compiled list of techniques the overhead projector would show was followed closely. Whenever possible, a question concerning each projection was constructed. The list of details to be shown by overhead projection was as follows:

### Pattern Layout

1. Grainline
2. Preparation of fabric
3. Pattern symbols
4. Types of folds
5. Pattern placement
6. Pinning of pattern
7. Seam extension
8. Marking of pattern

### Sleeves

1. Pieces needed
2. Markings
3. Preparation of sleeve cap
4. Matching sleeve to armhole
5. Distributing ease
6. Pinning
7. Stitching
8. Reinforcing

### Garment Closures

1. Slide fastener
  - a. Length of placket
  - b. Lapped application
  - c. Center application
  - d. Standards of a slide fastener
  - e. Treatment of facings
  - f. Cording foot
2. Buttonhole, Buttonholes and Buttons
  - a. Placement of buttonholes
  - b. Spacing of buttonholes
  - c. Size of buttonholes
  - d. Parts of buttonhole attachment
  - e. Attaching buttonhole
  - f. Making buttonhole
  - g. Sewing on button with thread shank

### Development of Visuals

The visuals developed were in accordance with the course content and approved standards of the department. The visuals of both control and experimental groups were presented to the lecturer, laboratory instructors and members of the researcher's graduate committee in the manner in which they were to be presented to classroom groups. Suggestions on presentation and details on techniques were discussed following the presentation.

#### Control Group

Visuals for the pattern layout demonstration were those used the previous term. Included was a length of muslin showing fabric preparation and another piece of muslin with grain lines marked and pattern pieces correctly pinned in place. Visuals made for the set-in sleeves demonstration consisted of two bodices and four sleeves showing the steps of setting in a sleeve. Visuals for garment closures included slide fasteners, a sample of fabric with placket opening basted and pressed open, a sample of fabric to be used for buttonholes and buttons, various buttons, a ruler, buttonholer attachment, needle and thread and sewing machine.

#### Experimental Group

Visuals for the pattern layout presentation included a set of overlays on fabric preparation, pattern symbols and pattern layout. A piece of leno weave cloth, transparent ruler and loose miniature acetate

pattern pieces were used to better explain the process. Visuals for the set-in sleeve presentation consisted of three frames of overlays. For the garment closures presentation visuals consisted of photographic copies of the steps in slide fastener lapped application, buttonholer parts, attaching buttonholer to machine and making the buttonhole; two sets of overlays showing placement of buttons and buttonholes and various plastic buttons.

The making of the visuals was exploratory as there were no commercial transparencies for the overhead projector in clothing construction. The homemade transparencies were made with various widths of chartpak tape and India ink on tracing paper. The graphics were transferred from the tracing paper to diazo film by the ammonia process. Color was introduced by adhesive colored paper, tinted film and colored film. Wherever possible, the technique of overlays was used to show a developmental process.

A selected frame of transparencies and paper copies of the transparencies and sequence of overlays for the overhead projector are found in Appendix B, p. 91.

#### Methods of Presentation

The variable being tested in this study was an instructional aid given during the laboratory period, with other aspects held as nearly constant as possible. The experimental group was taught by the overhead projector method rather than the demonstration method used in the control group.

A pilot presentation of both methods was given before the reviewing committee to verify procedures, to approve presentation and to suggest improvements. Each presentation was given before the committee in a similar manner in which it was given to the control and experimental groups. Outlines used for the presentations are in Appendix C, p. 142.

Demonstrations for the control group closely duplicated those of the previous term. Presentations with the overhead projector using transparencies, overlays and loose objects were prepared for the experimental group.

Instructors were responsible for laboratory sections, marks and demonstrations except for pattern layout, set-in sleeves and garment closures which were the responsibility of the researcher. The laboratory instructors were asked to report both positive and negative comments of students concerning the three presentations. The instructors gave assistance to an individual student who had difficulty with materials presented, but were asked not to repeat a presentation to the entire class.

#### Administration of Instruments

The pre-tests were administered before the presentations. The purpose of the pre-test was to measure the amount of clothing construction knowledge of each student prior to the specific presentation. The students were allowed seven minutes to answer the 23 questions on pattern layout; five minutes for 13 questions on set-in sleeves; and seven minutes for 21 questions on garment closures. A time limit was necessary because all test papers had to be collected before the presentation.



Immediately following the presentation, an equivalent<sup>65</sup> post-test was given to measure the change in knowledge of the student.

A 20 minute retention test was given at the last laboratory period of the class to measure the retention of knowledge of the student. The test included the 57 items randomly arranged that had previously been used in the pre-test and post-test. A reactionnaire and new learning check list were also given the last laboratory period (see Appendix D, p. 148).

### Validity

The goal of the testing instruments was to construct items which would measure the knowledge gained from the visuals. The following procedures were taken to insure validity of the instruments:

1. Conferences with the lecturer of beginning clothing construction were held and a list of processes to be shown was compiled.
2. The terminology and wording of the test items was reviewed by all instructors teaching the class.
3. The key was determined by the class instructors.
4. The directions--"Select the correct answer and fill in the corresponding space on your answer sheet--" were simple and clear.
5. Two types of questions were used on the tests.
6. No difficult computations were required of the students.
7. The factor of emotional disturbance was eliminated or lessened as the students were assured that the test scores would have absolutely no affect on their course mark.

---

<sup>65</sup>Ibid., p. 183, states, "Equivalent tests may be developed by arranging the items in reverse order in the two tests or to shift the order of the different sections."

Time limitation might have affected the validity; consequently, reliability may have been raised at the expense of validity.<sup>66</sup>

Even though grade point was known, a coefficient of validity was not determined because it is not likely to show significance in clothing construction courses.<sup>67</sup>

### Reliability

The reliability of a test is expressed in terms of the coefficient of reliability, which could not be determined on each test because of the limited number of questions (13-23) and the test was not repeated a second time under the same conditions.

The following factors that might have affected reliability in test construction were:

1. The items for the pre-test and post-test covered only one area or unit. The first test covered pattern layout; the second, set-in sleeves; and the third, garment closures.
2. Only two types of test items were used, multiple choice with four choices and short matching questions.
3. The directions were clear and adequately stated.
4. The test was easily read.
5. The test produced a wide range of scores.

Factors affecting reliability related to test administration were:

---

<sup>66</sup>Ibid., p. 94.

<sup>67</sup>Ibid., p. 95.

1. The students worked studiously as they knew the information was important to the researcher and would have no affect on their course mark.
2. Distractions and noise were eliminated.
3. A time limit was given.
4. An inflexible key was used.

### Methods of Analysis

The College Qualification Test Percentile Scores and the Reading Percentile Scores for the control and experimental groups were analyzed by the Median Test<sup>68</sup> to determine if selection procedures resulted in groups that were reasonably equivalent random samples from the same population.

Analysis of the scores of each test consisted of preparing a frequency table and computing descriptive statistics.

Analysis of covariance was used to analyze the raw scores of post-tests and the retention test, on a Control Data Corporation 3600 computer, to establish whether there were significant differences between the control group and the experimental group change of knowledge and retention of learning. In this study a probability of .05 or less was considered to be significant.

---

<sup>68</sup>Merle W. Tate and Richard C. Clelland, Non-Parametric and Shortcut Statistics (Danville, Illinois: Interstate Printers and Publishers, Inc., 1957), 72, 87.

## CHAPTER IV

### ANALYSIS OF DATA

Through this study the researcher sought to determine the effectiveness of the overhead projector in teaching clothing construction techniques by analyzing the following data: College Qualification Test Percentile Score, College Qualification Test Total Score, Reading Percentile Score, raw score of pre-test on pattern layout, set-in sleeves and garment closures, raw score of post-test concerning pattern layout, set-in sleeves and garment closures, and raw score of the retention test for each student.

The analysis of data will be described in the following order:

(1) analysis of test scores, (2) comparison of control and experimental groups and (3) testing the hypothesis.

#### Analysis of Test Scores

The pre-test, post-test and retention test scores were arranged in frequency tables (see Appendix E, p. 151) to obtain descriptive statistics (see Table 1). The general results were: The control group achieved higher on the pattern layout pre-test and post-test, the garment closures post-test and the retention test, but lower on the set-in sleeves pre-test and post-test than the experimental group. No significant differences in achievement were found between the control and experimental groups using descriptive statistics.

TABLE 1.--The range, mean, median, mode, and standard deviation on pattern layout, set-in sleeves, garment closures, and retention test scores for the control and experimental groups

Tests by Groups	Range of Scores	Mean	Median	Mode	Standard Deviation
<b>CONTROL GROUP</b>					
Pattern Layout Pre-test	4-19	12.9	13	12,17	4.24
Post-test	13-23	20	21	22	2.23
Set-in Sleeves Pre-test	2-8	4.3	4	4	1.41
Post-test	4-11	7.9	8	8	1.73
Garment Closures Pre-test	2-18	10.6	10	10	4.24
Post-test	8-20	17.3	18	19	2.64
Retention Test	37-54	45.2	47	48,49	4.69
<b>EXPERIMENTAL GROUP</b>					
Pattern Layout Pre-test	4-22	11.6	11	8	4.79
Post-test	7-23	19.6	20	20	3.00
Set-in Sleeves Pre-test	0-10	4.8	5	5	2.00
Post-test	2-12	8.1	8	7	1.73
Garment Closures Pre-test	2-19	10.5	10	8,9,14	4.00
Post-test	6-21	14.7	16	13,16,17	3.46
Retention Test	29-54	43.9	44	44	5.4

The control group range of scores was less than the experimental group. Variability within the control group was also less as measured by the standard deviation.

#### Comparison of Control and Experimental Groups

CQT Percentile Scores and the Reading Percentile Scores were the uninfluenced measures used to determine if the teaching method or the academic ability of the student caused the difference in test scores. The CQT Percentile and Reading Percentile Scores were acquired from an entrance test the students took at Michigan State University. The CQT Percentile Score is a measure of general academic aptitude or college ability. The CQT-T Score or the Total Score is the sum of the CQT subtests--verbal, information, numerical, English, and reading. The Reading Percentile Score is a measure of reading comprehension.

The Median Test was used to measure the difference in CQT Percentile Score and Reading Percentile Score between the control group and the experimental group. The Median Test determines whether independent groups (in this case, the control and experimental groups) have been drawn from the same population or from populations with equal medians.<sup>69</sup>

The median of the CQT Percentile Scores for the total population was between 32-34. The data for the computation includes a 2 x 2 layout as follows:

---

<sup>69</sup>Sidney Siegel, Nonparametric Statistics for Behavioral Sciences (New York: McGraw-Hill Book Co., 1956), 179.

	Control Group	Experimental Group	Total
Above Median	30	12	42
At or Below Median	15	33	48
Total	45	45	90

$$\chi^2 = 12.9$$

The computed  $\chi^2$  value of 12.9 showed a very significant difference in the CQT Percentile Scores. The control group and the experimental group of students were not equal in academic ability.

The median for the Reading Percentile Scores for the total population was between 42-46. A 2 x 2 layout was set up as follows:

	Control Group	Experimental Group	Total
Above Median	26	18	44
At or Below Median	19	27	46
Total	45	45	90

$$\chi^2 = 2.17$$

There was no significant difference between the reading comprehension ability of the students in the control and the experimental group as indicated by the computed  $\chi^2$  value.

Since a very significant difference in college ability was found between groups, analysis of covariance was applied.

#### Testing the Hypothesis

The analysis of covariance increases the precision of an experiment by eliminating causes of variation not controllable by the experimental

design. The analysis of covariance requires measures uninfluenced by the particular treatments to which the subjects were assigned. The CQT-T Score and the Reading Percentile Score obtained prior to the application of the treatments obviously were not affected by the treatment.

The problem was to investigate if differences in raw scores were due to college ability, as measured by CQT-T Score and Reading Percentile Score, or the teaching method.

The F statistic was used to test the significance of the difference between the achievement of the experimental and control groups after adjustment had been made for any inequalities in the two groups considering CQT-T Score, Reading Percentile Score and pre-test scores.

The hypothesis being tested by Ruble's formulas<sup>70</sup> was: The overhead projector presentation of clothing construction techniques will be as effective as the classroom demonstration presentation.

---


$$\text{Formula A: } \frac{DF_F (\text{Overall } R_F^2 - \text{Overall } R_{F_9}^2)}{1 + \text{Overall } R_F^2} = F$$

$$\text{Formula B: } \frac{DF_I (R_{F_9} - R_{I_9})}{1 - R_{F_9}} = F$$

Formula A was used when CQT-T Scores, Reading Percentile Scores and pre-test scores were taken into account. Formula B was used when only CQT-T Scores and pre-test scores were considered as prediction variables.

William L. Ruble is programming consultant for the Computer Data Corporation 3600, at Michigan State University.



TABLE 2.--Regression coefficients: based on prediction variables and test data

Prediction Variables <sup>a</sup>	Test	DF <sub>F</sub>	Overall	Overall	1-Overall	F
			R <sup>2</sup> <sub>F</sub>	R <sup>2</sup> <sub>I</sub>	R <sup>2</sup> <sub>F</sub>	
CQT, R, P	Pattern Layout	86	.6095	.6073	.3905	.0485
CQT, R, P	Set-in Sleeves	86	.3145	.3141	.6855	.0514
CQT, R, P	Garment Closures	86	.5419	.5097	.5419	6.0547
CQT, R	Retention	87	.0322	.0309	.9668	.2079
		DF <sub>I</sub>	R <sub>F9</sub>	R <sub>I9</sub>	1-R <sub>I9</sub>	
CQT, P	Pattern Layout	87	.5987	.5973	.4027	.0302
CQT, P	Set-in Sleeves	87	.3116	.3109	.6891	.0833
CQT, P	Garment Closures	87	.5405	.5094	.4906	5.5252
CQT	Retention	88	.0074	.0065	.9935	.0806
F.001 (1,86) = 632		F.01 (1,86) = 632		F.05 (1,86) = 253		
F.001 (1,87) = 632		F.01 (1,87) = 632		F.05 (1,87) = 253		
F.001 (1,88) = 632		F.01 (1,88) = 632		F.05 (1,88) = 253		

<sup>a</sup>Under prediction variables, CQT means College Qualification Test Total Score; R means Reading Percentile Score and P means Appropriate pre-test.

The post-test and retention test data were analyzed taking into account the following combination of predicted variables:

Combination	CQT-T Score	Reading Percentile Score	Appropriate Pre-test
Post-test			
1.	x	x	x
2.	x		x

Combination	CQT-T Score	Reading Percentile Score	Appropriate Pre-test
Retention test			
1.	x	x	
2.	x		

For each of these four combinations of appropriate test and prediction variables, no significant differences were found between the control and experimental groups. The hypothesis--The overhead projector presentation of clothing construction techniques will be as effective as the classroom demonstration presentation--was accepted. The students performed equally well as measured by test scores, irrespective of method of teaching.

## CHAPTER V

### REACTIONS OF STUDENTS TO TEACHING METHODS

The reactionnaires were administered to the control and experimental groups the last laboratory period. Haas lists student reactions as one of the six measures of effectiveness for audio-visual materials.<sup>71</sup>

The reactions of students in this study will be described in three categories: (1) control group reactionnaire, (2) experimental group reactionnaire and (3) summary of reactionnaires.

#### Control Group Reactionnaire

The control group taught by the demonstration method was given two questions. The first question was:

Demonstrations concerning pattern layout, set-in sleeves and garment closures were presented to the class. What would you consider to be the advantages and disadvantages of this method? (See Appendix D, p. 149.)

Free response answers were categorized and tallied as follows:

---

<sup>71</sup>Kenneth B. Haas and Harry Q. Packer, Preparation and Use of Audio-Visual Aids (3rd ed.; New York: Prentice-Hall Inc., 1955), 281.

Advantages of Demonstration Method		Disadvantages of Demonstration Method	
Responses	Number Times Mentioned	Responses	Number Times Mentioned
Actually seeing the process	19	Hard to see	9
Clarified method	8	Presentation too fast	5
Aids unexperienced and experienced	2	Prefer demonstrations in lecture	5
Effective method	2	Presented too far in advance	4
Everyone receives same instruction	1	Written material needed	2
Opportunity to ask questions informally	1		
Total responses	35	Total responses	25

Actually seeing the process using fabric and equipment was the advantage most often mentioned by the control group. The following comments are reactions of the group:

"There is great advantage seeing something done. As it was given in lecture, you could only guess as to the right way, but with seeing the demonstration you could then picture in your mind exactly how to do it."

"It is easier to understand a method if you can see it, than it is to read it."

"When it is done, it is understood better than just seeing an illustration."

"Enabled me to see exactly what had to be done."

Other advantages listed by the control group were:

"Easy to understand."

"I think this method is a great aid to those who have had little or no experience with sewing."

"Necessary so that everyone would do the same way."

"I had a chance to ask questions informally."

"Sums up the old saying 'one picture is worth a thousand words.' When dealing with this material it seems the only effective method."

The disadvantage most often mentioned by the control group was difficulty in seeing the demonstration. Comments were of this nature:

"Hard to get close enough to see."

"Too many people trying to see at once."

"Sometimes difficult to see with all students crowding around."

Five students in the control group would have preferred the demonstrations during class time instead of laboratory period; four students felt the demonstrations were given too far in advance; two students expressed a desire for more written material and five students said, "The demonstrations were too fast."

The second question on the control group reactionnaire was:

"If in the demonstrations an overhead projector had been used, what do you think your reaction would have been?"  
(See Appendix D, p. 149.)

Responses fell into three categories--positive reaction, negative reaction and no reaction.

Twenty-four of the 38 students who filled in the reactionnaire wrote negative comments; these are typical:

"I don't think I would have liked it at all. If the group is small enough it's possible to see everything by just standing around."

"I wouldn't have liked it."

"The 'live' demonstrations are much more effective and would be much easier to understand."

"I do not think I would have learned anything. Overhead projectors are all right for a lecture but not for a lab."

The 13 positively classified responses were similar to the following:

"I think it would make viewing much easier."

"I probably could have seen more of what was happening."

"Could see better--a little more abstract, but better."

"Good, the use of the projector would insure a clear and accurate picture of the whole process."

One student felt she would react the same to either method.

#### Experimental Group Reactionnaire

The experimental group taught by the overhead projector method was asked four questions. Question 1 was:

"The overhead projector has been used in presenting pattern layout, set-in sleeves and garment closures to the class. What would you consider to be the advantages and disadvantages of this method?" (See Appendix D, p. 150.)

Classification of responses and number of times response was mentioned are as follows:

Advantages of Overhead Projector Method		Disadvantages of Overhead Projector Method	
Responses	Number Times Mentioned	Responses	Number Times Mentioned
Everyone can easily see	25	Sometimes hard to	
Points to be learned very		transfer learning	8
clear	9	Too fast	4
Easy to demonstrate or		Sometimes too small to	
explain	5	be distinct	3
Good in large group	4	Lighting	2
Organized; well planned	3	Visuals didn't portray	
Everyone same instruction	2	process	2

(continued)

(continued)

Advantages of Overhead Projector Method		Disadvantages of Overhead Projector Method	
Responses	Number Times Mentioned	Responses	Number Times Mentioned
Quicker; cuts teaching time	2	Need longer explanation Demonstrator's hand in way Hard to see	1 1 1
Total responses	50	Total responses	22

The advantage most often mentioned by the experimental group was,  
 "Everyone could see." Other typical comments were:

"You can actually see what to do and what steps to take."

"You can see all operations clearly."

"Easy to see and consequently understand."

"Everyone can see the demonstrations clearly."

Other advantages listed by the experimental group were:

"Makes points to be learned very clear."

"Easy to demonstrate."

"Enables teaching to mass."

"Organized ahead of time."

"Everyone gets the same instructions."

"Quicker."

The disadvantage most often mentioned by the experimental group involved the transfer of learning to the actual fabric or technique. Reactions were:

"Hard to visualize it on the actual material."

"Hard to learn from just watching how it is supposed to be done instead of having it done right on the spot."

"Couldn't see the real material or process used."

"Sometimes it is not true perspective and one has a hard time imagining what is going to happen on the real material."

Four students felt the presentation went too fast; three students thought some details in the drawings were too small to be seen; two students suggested turning out the lights; one student would have liked longer explanations with the presentation; and one student felt the operator's hand was in the way.

Question 2 of the experimental group's reactionnaire was: "What suggestions do you have for improving teaching with the overhead projector?" (See Appendix D, p. 150.)

Suggestions for improvement given by the experimental group were: that it be used in lecture, turn out the lights and need for clearer illustration, mentioned twice; and label visual more, have printed material and use only light colored pictures, each mentioned once.

Question 3 was: "What was your reaction to the overhead projector?" (See Appendix D, p. 150.)

Reactions of the experimental group were 37 positive and three negative.

Typical positive reactions were:

"Very favorable. The visuals were excellent. I thought the demonstrations were the most valuable part of the course."

"It was nice to be able to see the demonstrations without stretching and looking over everyone."

"Very good--excellent way to teach construction."

"I liked it."



The three negative reactions were as follows with no reasons given:

"Didn't like."

"I don't feel it is at all beneficial."

"Did not learn much."

Question 4 was:

"Would you have preferred classroom demonstration (similar to the demonstration on curves) in place of the overhead projector? Give reasons for your answer. Yes \_\_\_\_\_ No \_\_\_\_\_ Uncertain \_\_\_\_\_ Reasons: " (See Appendix D, p. 150.)"

The experimental group was exposed to both methods, as the parts of the sewing machine and manipulation of curves were demonstrated to the group by their laboratory instructor.

The 20 students favoring the overhead projector method gave many reasons for their choice. Fourteen students selected the experimental method because of easy visibility; three students chose the experimental method because coverage of material took a shorter time; one student felt the overhead projector was "much clearer but lacked personal contact;" one student found the overhead projector easier to understand; and two students just preferred the experimental method with no reason stated.

Of the 10 students who chose demonstration method rather than overhead projector method, seven thought they would gain more from the demonstration; one student thought the overhead projector method went too fast; one student preferred the presentation to be during class period as laboratory time was so limited; and one did not give a reason for her preference.

Of those uncertain, two students were indifferent, it did not matter to them; two students "just liked to see things done though the other was fine"; one said, "It depends on who gives the presentation"; one student would prefer the presentation in class period; three students felt it would depend on subject matter; and one student said, "A little of both is necessary."

Of all the variables checked, only the reasons given by the students for their preferences for demonstration or overhead projector are significant. Variables analyzed included grade level, grade point, which presentations were new learnings, and experience in sewing. Probably due to the small sample, none of these proved consistent from one laboratory section to another.

#### Summary of Reactionnaires

The most often mentioned advantage of the experimental group--everyone could easily see--was inversely related to the most often mentioned disadvantage of the control group--hard to see.

"Seeing the actual process" was the most often mentioned advantage of the control group and "not being able to see the actual process" was the most often mentioned disadvantage of the experimental group. The most often mentioned advantages and disadvantages of both groups seemed to be inversely related.

Most of the students felt they were able to understand from the presentation and felt the method used in the classroom was suited to the situation.

Mentioned frequently was a "too fast" presentation. Perhaps the instructors in this beginning class need to reconsider the amount of material being presented in a three credit course to beginning students.

## CHAPTER VI

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

The beginning clothing construction course at Michigan State University presents the Principles of Clothing Construction showing the relationship of these principles to fit, style or design details, fabric handling, and garment assembling. The course consists of two, one-hour lectures and one, two-hour laboratory, per week. The instructors are challenged to teach 100 students in subject matter traditionally taught to 15-20 students, and for this reason, are finding previously used illustrative materials inadequate.

The over-all objective of this study was to investigate the effectiveness of the overhead projector in teaching selected clothing construction techniques to the beginning clothing construction class.

The overhead projector is a transparent still projector capable of enlarging up to 10" x 10" transparencies with brilliant screen images suitable for use in a lighted room. Color can be projected permitting development of many types of transparencies. The overhead projector is especially useful in large classrooms where a chalkboard would be ineffective or useless. The instructor plays a central role because the overhead projector permits the instructor to face the class and maintain eye contact during the presentation.

In a developmental presentation using the overhead projector, each component part may be presented as the instructor senses an audience's "state of readiness" for the next step. Step-by-step learning can be provided through use of overlays or through use of a plain piece of paper covering all but the first point. After discussion of a point, the instructor moves to the next point. The overhead projector does not supplant teaching; it supplements teaching.

The experimental design of this study included teaching pattern layout, set-in sleeves and garment closures to a control group by classroom demonstration and to an experimental group by overhead projector method during the laboratory period. Each group was composed of three laboratory sections.

The Median Test was used to measure the difference in CQT Percentile Scores and Reading Percentile Scores between the control group and the experimental group.

The hypothesis--the overhead projector presentations of clothing construction techniques will be as effective as the classroom demonstrations--was tested by analyzing scores from a pre-test taken prior to the presentations, a post-test given immediately following the presentation and a retention test administered the last laboratory period. Analysis of covariance was used to test for significant differences in change of knowledge and retention of learning between the control group and the experimental group.

Student reactions to teaching methods were obtained by a free response reactionnaire.

### Conclusions

Based on evidence presented in this limited research the following conclusions have been drawn:

1. The overhead projector presentations of selected clothing construction techniques were as effective as the classroom demonstration presentations on the basis that there were no significant differences in change of knowledge and retention of learning between control and experimental groups.
2. The overhead projector presentations were equally effective with large and small classes. The overhead projector made it possible for all the students to see the presentations with equal clarity.
3. Visuals are especially helpful in teaching clothing construction to large classes. The overhead projector was an effective media, but need not be the only method of presentation.
4. The overhead projector was an accepted instructional aid. The experimental group preferred the overhead projector method to the demonstration method.
5. "Seeing the presentation" was the most often mentioned advantage of the overhead projector, although some students found it difficult to transfer learning from the abstract media to practical application.

### Recommendations

This study was limited to determining the effectiveness of the overhead projector in teaching pattern layout, set-in sleeves and garment closures to a beginning college class in clothing construction. Suggestions for further research are:

1. To develop more clothing construction visuals to be used on the overhead projector.
2. To investigate the effectiveness of the overhead projector in teaching other clothing construction techniques.
3. To investigate the effectiveness of the various techniques of presenting visuals on the overhead projector. For instance, do students in clothing construction benefit more from a series of overlays than a single transparency?
4. To investigate the relationship between effectiveness of the overhead projector and grade level, intelligence quotient and experience in sewing.

#### Recommendation to Instructors

The researcher recommends that instructors, of both large and small classes, become aware of the potential resource of the overhead projector and investigate the possibility of supplementing their teaching with this instructional aid.

## BIBLIOGRAPHY

### Books

- Army, Clara Brown. Evaluation in Home Economics. New York: Appleton-Century-Crofts, Inc., 1953.
- Bachman, John W. How to Use Audio-Visual Materials. New York: Association Press, 1959.
- Bane, Allyne. Creative Sewing. New York: McGraw-Hill Book Co. Inc., 1956.
- Brown, James, Lewis, Richard B., and Harclerod, Fred F. A-V Instruction Materials and Methods. New York: McGraw-Hill Book Co. Inc., 1959.
- Burtis, Eric F., and LeMay, Jame E. They See What You Mean. Johnson City, New York: Ozalid, Division of General Aniline and Film Corporation, 1959.
- Dale, Edgar. Audio-Visual Methods in Teaching. Revised. New York: The Dryden Press Inc., 1954.
- Foster, Laurence, and Kidder, William. Audio-Visual Materials and Techniques. San Francisco: Fearon Publishers, 1956.
- Freedman, Florence B., and Berg, Ester L. Classroom Teachers Guide to AV Materials. New York: Chilton Co., 1961.
- Haas, Kenneth B., and Packer, Harry Q. Preparation and Use of Audio-Visual Aids. 3rd. ed. New York: Prentice-Hall Inc., 1955.
- Hartsell, Horace Clay, and Veenendaal, Wilfred L. Overhead Projection. Buffalo, New York: Henry Stewart Inc., 1960.
- Henderson, Algo D. Policies and Practices in Higher Education. New York: Harper and Brothers, 1960.
- deKieffer, R. E., and Cochran, Lee W. Manual of Audio-Visual Techniques. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1962.
- Kinder, James S. Audio-Visual Materials and Techniques. New York: American Book Co., 1950.



- Kinder, James S., and McClusky, Dean F. The Audio-Visual Reader. Dubuque, Iowa: Wm. C. Brown Co., 1954.
- Mannino, Philip. ABC's of Visual Aids and Projectionist Manual. State College, Pa.: M. O. Publishers, Box 406, 1953.
- Mansfield, Evelyn. Clothing Construction. New York: Houghton Mifflin Co., 1953.
- McClusky, Dean F. Audio-Visual Teaching Techniques. Dubuque, Iowa: Wm. C. Brown Co., 1949.
- McKown, Harry C., and Roberts, Alvin B. Audio-Visual Aids to Instruction. New York: McGraw-Hill Book Co. Inc., 1949.
- Remmers, H. H. Introduction to Opinion and Attitude Measurement. New York: Harper and Brothers, 1954.
- Sands, Lester B. Audio-Visual Procedures in Teaching. New York: The Ronald Press Co., 1956.
- Selltiz, Claire, et al. Research Methods in Social Relations. Rev. ed. New York: Holt, Rinehart and Winston, 1961.
- Siegel, Sidney. Nonparametric Statistics for Behavioral Sciences. New York: McGraw-Hill Book Co., 1956.
- Tate, Merle W., and Clelland, Richard C. Nonparametric and Shortcut Statistics. Danville, Illinois: Interstate Printers and Publishers, Inc., 1957.
- Walker, Helen M., and Lev, Joseph. Statistical Inference. New York: Holt, Rinehart and Winston, 1953.
- Wittich, Walter Arno. Audio-Visual Materials, Their Nature and Use. New York: Harper and Brothers, 1953.
- Wittich, Walter, and Schuller, Charles. Audio-Visual Materials. New York: Harper and Row Publishers, 1962.

#### Articles and Periodicals

Audio-Visual Communication Review, XI, No. 1 (1963).

- Bissex, Henry S. "How Overhead Projection Aids Large Group Instruction," Educational Screen, XXXVII (May, 1958), 37 and 230-231.
- Cohen, Samuel. "Classroom Experiment Shows 'Saturation' AV Gets Results," Educational Screen and Audiovisual Guide, XXXIX (July, 1960), 327.

- Duerst, L. D. "A System of Overhead Projection," Audio-visual Instruction, VIII (May, 1963), 332-335.
- Finstad, Allan. "A Quick Method for Transparencies," Audio-visual Instruction, II (January, 1957), 18-19.
- Fleck, Henrietta. "Overhead Projector," Forecast for Home Economists, LXXIX, No. 2 (February, 1963), 17 and 94.
- Fowlkes, John Guy. "A Partnership in Learning Materials," Educational Screen and Audiovisual Guide, XL (August, 1961), 392-393.
- Querin, David V. "The Overhead Projector at the University of Delaware," Audio-visual Instruction, VII (April, 1962), 214-215.
- Hadsell, Reign S. "Evaluation: Has Learning Taken Place?" Audio-visual Instruction, II (October, 1957), 146-148.
- Hoffman, Doretta S. "We Need Visual Aids," Journal of Home Economics, LIV, No. 5 (May, 1962), 377.
- Hohlfeld, J. F. "A New Slant on Overhead Projectors," Educational Screen and Audiovisual Guide, XXXIX (March, 1960), 125.
- Hyer, Anna L. "The Horns of the Dilemma," Audio-visual Instruction, II (December, 1957), 284.
- Kelley, Gaylen B. "A Study of Teachers' Attitudes Toward Audiovisual Materials," Educational Screen and Audiovisual Guide, XXXIX (March, 1960), 118-121.
- Kemp, Jerrold E. "Producing Transparencies for College Instruction," Educational Screen, XXXVII (June, 1958), 280-281.
- Kidd, Kenneth P. "Dynamic Aids for Teaching Math," Educational Screen and Audiovisual Guide, IV (March, 1959), 130-131.
- Laner, S. "The Impact of Visual Aid Displays Showing a Manipulative Task," Quarterly Journal of Experimental Psychology, VI (August, 1954), 95-108.
- Lyle, Dorothy S. AHEA Blueprint for Progress. Cleveland, Ohio. June 27, 1961.
- Miller, Morris. "Transparencies Save Time for Accounting Teacher," Audio-visual Instruction, VII (April, 1962), 220-221.
- "Mrs. Burrough's Magic Pencil," Audio-visual Instruction, VII (April, 1962), 222-223.
- Nesbitt, William O. "Big Classes in Texas," Educational Screen and Audiovisual Guide, XXXVIII (November, 1959), 594-596.

"Overhead Perks Up Class Participation," Audio-visual Instruction, VII (April, 1962), 218-219.

Poe, Edgar A. "In Pittsburg, California, The Overhead Proves Its Adaptability," Audio-visual Instruction, VII (April, 1962), 206-207.

Rocheleau, R. Lee. "A Team Teacher Bears Witness," Audio-visual Instruction, VII (April, 1962), 205.

Ruark, Henry C. Jr. "NDEA Title III, Its Progress and Promise in Oregon," Educational Screen and Audiovisual Guide, XXXVIII (December, 1959), 642-644.

Sanborn, William B. "Our Future Stake in Instructional Tools," Educational Screen and Audiovisual Guide, XXXVIII (December, 1959), 638-641.

Spiegler, K. S. "Overhead Projector at Israel Tech," Educational Screen and Audiovisual Guide, XL (October, 1961), 536-537.

Storsteen, Emma. "In North St. Paul the Overhead Becomes Part of Daily Class Activities," Audio-visual Instruction, VII (April, 1962), 208-209.

Story, George O. "The Overhead Promotes Early Love of Reading," Audio-visual Instruction, VII (April, 1962), 216-217.

Stepp, Robert E. "Inroads On The Campus," Audio-visual Instruction, VII (April, 1962), 211-213.

Thomure, Eugene F. "New Potential for Teaching Deaf Children," Audio-visual Instruction, VII (April, 1962), 210-211.

"Thumbnail Testimonials," Audio-visual Instruction, VII (April, 1962), 226-227.

"Tool of the Times," Audio-visual Instruction, VII (April, 1962), 201.

Udell, Gene. "Transparencies for Learning," Audio-visual Instruction, II (June, 1957), 168-169.

Veenendaal, Wilfred L. "The Visualization of an Idea," Audio-visual Instruction, II (December, 1957), 260-261.

Washcoe, Major W. C. "The Versatile Overhead Projector," Educational Screen and Audiovisual Guide, XXXII (May, 1953), 242.

Winger, Fred E. "The Overhead Projector in Business Education," Business Education Forum, VII, No. 4 (January, 1953), 7, 9-11.

Winston, William L. "Overhead Hits Stride in New Instructional Program," Audio-visual Instruction, VII (April, 1962), 202-203.

Unpublished Materials

Bradley, Robert L. "Lecture Demonstration vs. Individual Laboratory Work in a Natural Science Course at Michigan State University." Unpublished Ph. D. dissertation, College of Education, Michigan State University, 1962.

Callahan, Michael. Head, Training Aids Branch, Department of the Navy, Washington, D. C. Personal letter, July 13, 1964.

Coats and Clark Teaching Packet on Zippers. Educational Bureau of Coats and Clark Inc., 430 Park Avenue, New York 22, N. Y.

Coolican, Pat. "A Study of the Effectiveness of Teaching by Television Versus Teaching by the Use of an Extension Bulletin." Unpublished Master's thesis, Extension EPD Office, Michigan State University, 1960.

"How-to-Sew Sleeves." Simplicity Pattern Company, Inc. Educational Services, 200 Madison Avenue, New York 16, N. Y.

Instruction on the Operation and Care of Singer Buttonholer No. 160506. The Singer Manufacturing Company, 1959.

Meacham, Esther Anne. "The Relative Effectiveness of Face-to-Face Lecture Versus Instructional Television in a College Clothing Course." Unpublished Ph. D. dissertation, College of Home Economics, Ohio State University, 1962.

Michigan State University Catalog 1963-64, Undergraduate and Graduate Programs, Michigan State University Publication, A-165.

"Principles of Clothing Construction," TCRA 152. Prepared by the staff of the Department of Textiles, Clothing and Related Arts, College of Home Economics, Michigan State University, 1963.

Rocke, Helen. "Let's Cut and Sew With the Grainline." Clothing Leaflet 2, Cooperative Extension Work in Agriculture and Home Economics, University of Nebraska College of Agriculture, Lincoln, Nebraska.

Talon Zipper Packet. Talon Educational Service, 41 East Fifty-First Street, New York 22, N. Y.

Testing Bulletin No. 5. "Objective Test Questions." Prepared by the Office of Evaluation Services, The Basic College, Michigan State University, May, 1957.

Testing Bulletin No. 6. "The Preparation and Use of Objective Tests." Prepared by the Office of Evaluation Services, The Basic College, Michigan State University, November, 1957.

## **APPENDIX A**

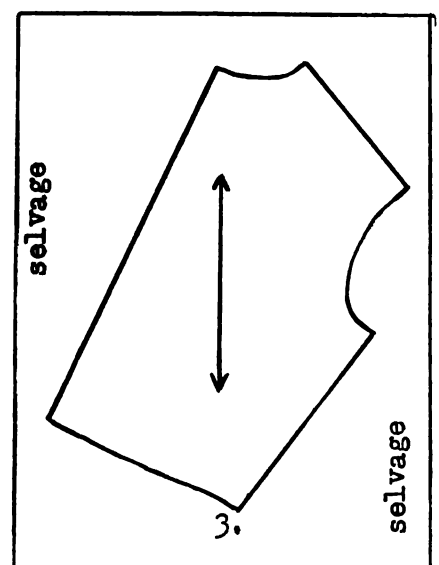
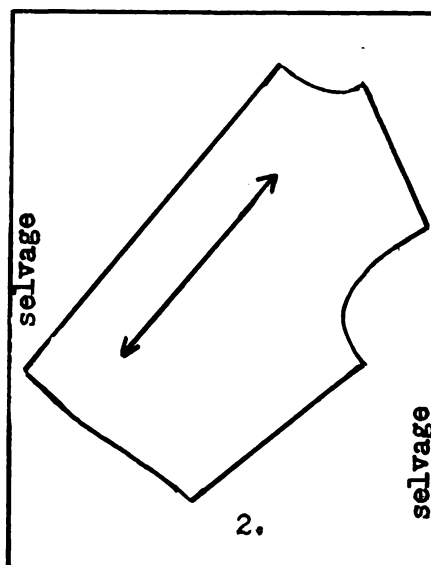
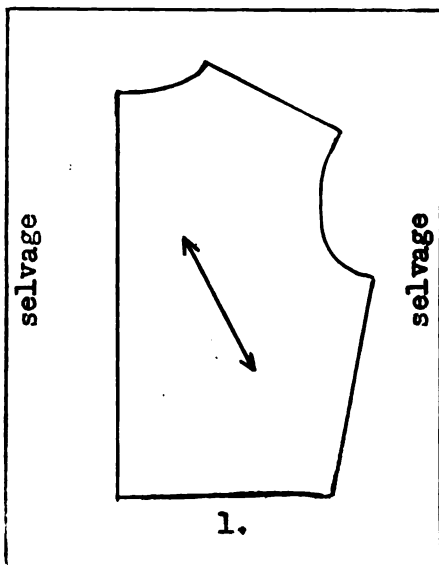
**Pre-tests, Post-tests and Retention test**

**PATTERN LAYOUT PRE-TEST**

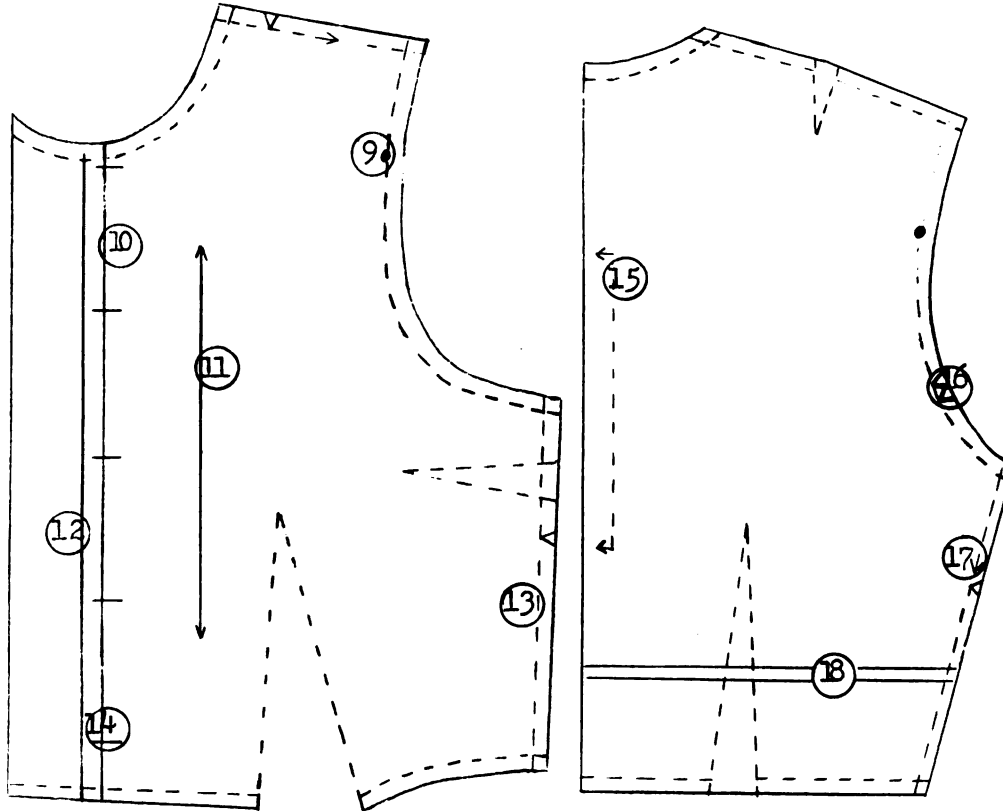
Your answers to the following questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures important in pattern layout and marking. Work as rapidly as possible as there is a 7 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on acceptable department procedures. **SELECT THE CORRECT ANSWER AND FILL IN CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

1. To locate the grain of the fabric, uneven ends of the fabric may be straightened by
  1. tearing across the fabric.
  2. pulling a thread across the fabric.
  3. following a printed design across the fabric.
  4. 1 and 2 of the above.
  5. all of the above.
2. To straighten distorted fabric, the shorter end of the fabric is
  1. stretched on the straight of the goods in opposite direction until the lengthwise threads are parallel with the selvages.
  2. stretched on the true bias in opposite direction until the crosswise threads are squared with the selvages.
  3. either of the above.
  4. neither of the above.
3. In order to determine the layout that should be used from the pattern guide sheet, it is necessary to know
  1. pattern number, size of pattern and width of fabric.
  2. size of pattern, width of fabric and style version.
  3. width of fabric, amount of material purchased and size of pattern.
  4. pattern number, size of pattern and style version.
4. When pinning a pattern to the fabric, the pins should be placed
  1. parallel to the grain pointing toward cutting line.
  2. perpendicular to the grain pointing toward cutting line.
  3. perpendicular to the cutting line.
  4. within the seam allowance, parallel to the cutting line.
5. When laying a pattern piece on the material, lengthwise grain is established by measuring from
  1. cutting line to selvage.
  2. center front or center back to the selvage.
  3. middle of the grain marking to the selvage.
  4. each end of the extended pattern grain line to the selvage.
6. Seam lines which are most likely to be adjusted during fitting should be cut with generous seam allowances. In the pattern layout, the following seams should be increased to 1 inch: shoulder, skirt side,

1. waistlines, neck, sleeve cap and underarm.
  2. center back of skirt and bodice, underarm, armseye and waistlines.
  3. underarm, waistlines, sleeve underarm, and center back of skirt and bodice.
  4. sleeve underarm, waistlines, armseye and neck.
7. In working with muslin master patterns, markings are made on both the wrong and the right sides of the fabric to facilitate fitting. Which of the following markings should appear on the wrong side of the muslin?
1. seam lines, darts, tucks, pleats, skirt hem line, crossmarkings.
  2. center front, seams, darts, crossmarkings.
  3. crossmarkings, grain line at bust level, center back, seams and darts.
  4. darts, crossmarkings, seam lines and sleeve cap seamline.
8. The fit of a garment is very dependent upon the placement of grain. Which of the following bodices is laid on the fabric correctly?



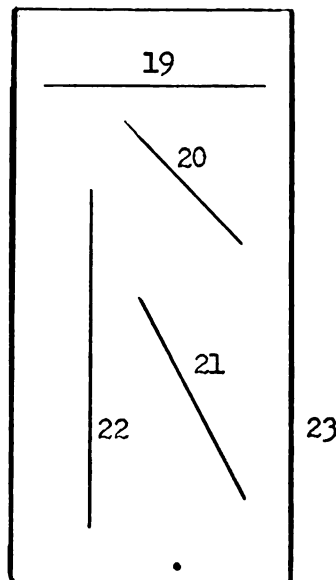
- 9-18. Illustrations of two pattern pieces are shown, each bearing certain pattern markings with the number of the questions on them. Select only the one best answer for each question from the list on the right. Responses are to be used only once; some may not be used.



#### RESPONSES

1. mark indicating grain line of material
2. buttonhole
3. direction of stitching
4. cutting line
5. alteration line
1. seam line
2. fold for facing
3. center front
4. notches for matching
5. matching points
1. place on fold of material
2. easing

- 19-23. The rectangle below represents 2 yards of 36 inch material. MATCH THE FOLLOWING by selected the correct answer and filling in the corresponding space on your answer sheet.



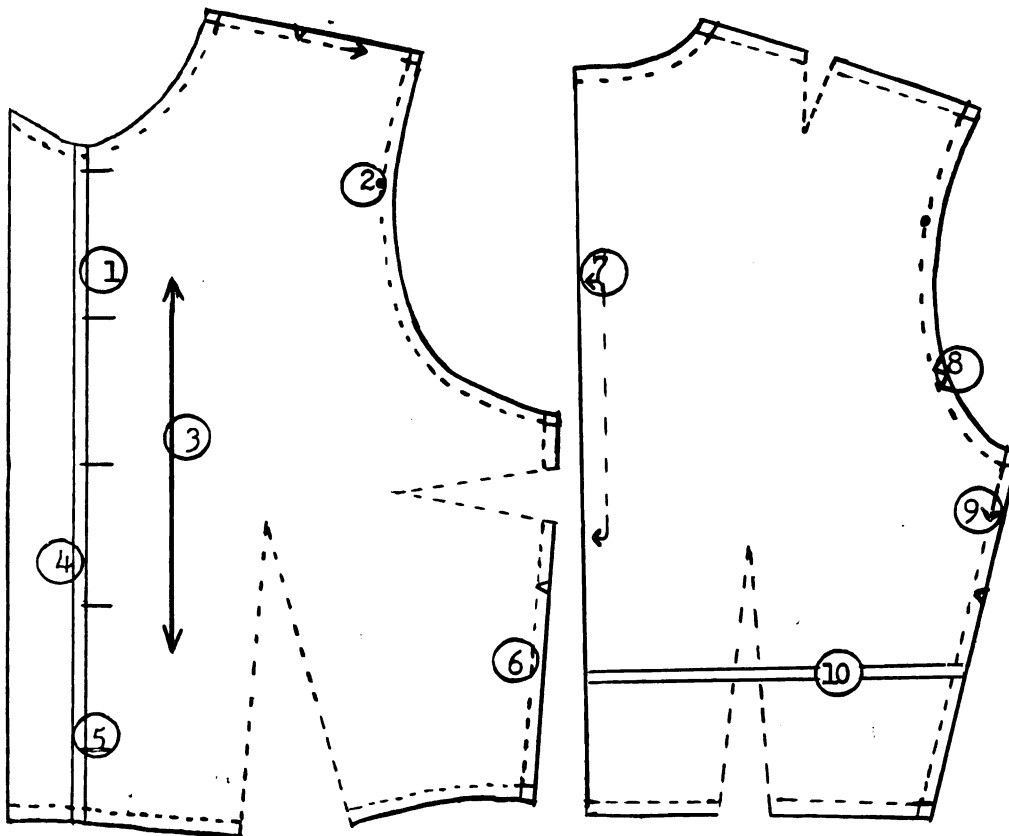
1. lengthwise grain
2. crosswise grain
3. selvage
4. true bias
5. bias



## PATTERN LAYOUT POST-TEST

Your answers to the following questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures important in pattern layout and marking. Work as rapidly as possible as there is a 7 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on acceptable department procedures. **SELECT THE CORRECT ANSWER AND FILL IN CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

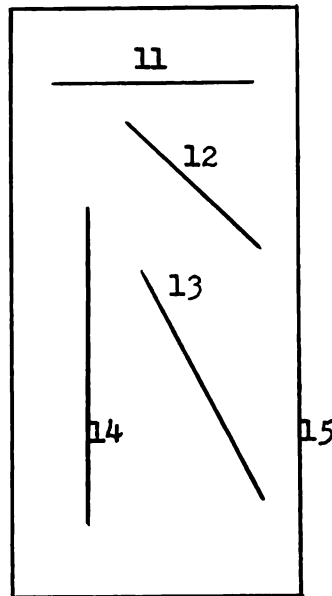
- 1-10. Illustrations of two pattern pieces are shown, each bearing certain pattern markings with the number of the questions on them. Select only the one best answer for each question from the list on the right. Responses are to be used only once, some may not be used.



## RESPONSES

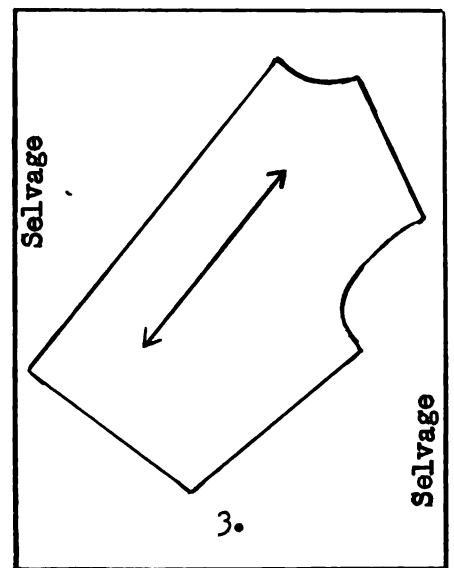
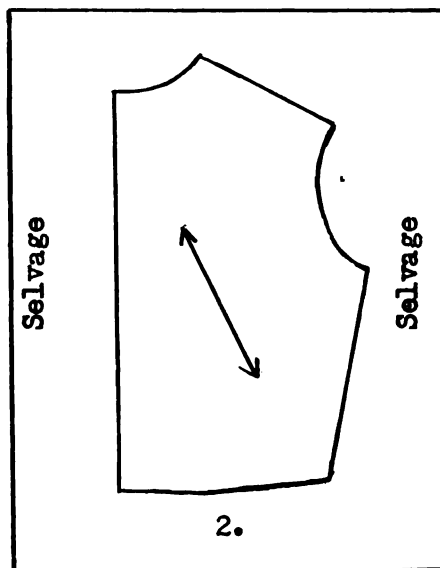
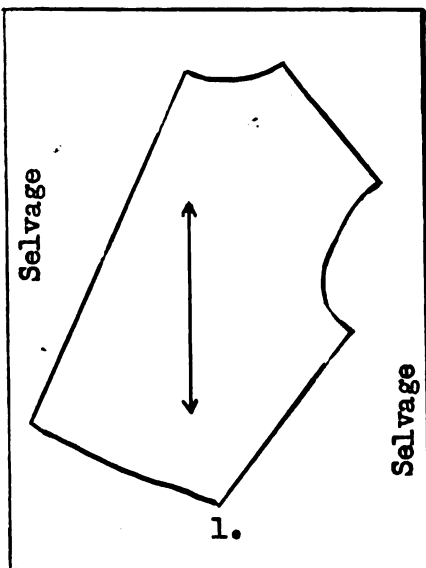
1. place on fold of material
2. direction of stitching
3. center front
4. buttonhole
5. easing
1. notches for matching
2. cutting line
3. fold for facing
4. seam line
5. alteration line
1. matching points
2. mark indicating grain line of material

- 11-15. The rectangle below represents 2 yards of 36 inch material. MATCH THE FOLLOWING by selecting the correct answer and filling in the corresponding space on your answer sheet.



1. true bias
2. selvage
3. bias
4. crosswise grain
5. lengthwise grain

16. The fit of a garment is very dependent upon the placement of grain. Which of the following bodices is laid on the fabric correctly?



17. In working with muslin master patterns, markings are made on both the wrong and the right side of the fabric to facilitate fitting. Which of the following markings should appear on the wrong side of the muslin?
  1. crossmarkings, grain line at bust level, center back, seams and darts,
  2. seam lines, darts, tucks, pleats, skirt hem line, crossmarkings.
  3. darts, crossmarkings, seam lines and sleeve cap seamline.
  4. center front, seams, darts, crossmarkings.
18. In order to determine the layout that should be used from the pattern guide sheet, it is necessary to know
  1. size of pattern, width of fabric and style version.
  2. pattern number, size of pattern and style version.
  3. pattern number, size of pattern and width of fabric.
  4. width of fabric, amount of material purchased and size of pattern.
19. When laying a pattern piece on the material, lengthwise grain is established by measuring from
  1. each end of the extended pattern grain line to the selvage.
  2. middle of the grain marking to the selvage.
  3. center front or center back to the selvage.
  4. cutting line to selvage.
20. To locate the grain of the fabric, uneven ends of the fabric may be straightened by
  1. following a printed design across the fabric.
  2. pulling a thread across the fabric.
  3. tearing across the fabric.
  4. 2 and 3 of the above.
  5. all of the above.
21. When pinning a pattern to the fabric, the pins should be placed
  1. parallel to the grain pointing toward cutting line.
  2. within the seam allowance, parallel to the cutting line.
  3. perpendicular to the cutting line.
  4. perpendicular to the grain pointing toward cutting line.
22. To straighten distorted fabric, the shorter end of the fabric is
  1. stretched on the true bias in opposite direction until the crosswise threads are squared with the selvages.
  2. stretched on the straight of the goods in opposite direction until the lengthwise threads are parallel with the selvages.
  3. either of the above.
  4. neither of the above.
23. Seam lines which are most likely to be adjusted during fitting should be cut with generous seam allowances. In the pattern layout, the following seams should be increased to 1 inch: shoulder, skirt side,

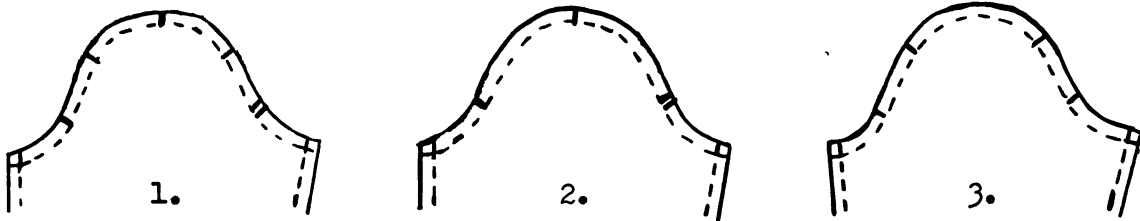
1. center back of skirt and bodice, underarm, armscye and waistlines.
2. underarm, waistlines, sleeve underarm, and center back of skirt and bodice.
3. sleeve underarm, waistlines, armscye and neck.
4. waistlines, neck, sleeve cap and underarm.

## SET-IN SLEEVES PRE-TEST

These questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures important in setting-in a sleeve. Work as rapidly as possible, as there is a 5 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on accepted department procedures. **SELECT THE CORRECT ANSWER AND FILL IN THE CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

1. When setting-in a sleeve the easing of the sleeve cap into the arm-hole is an example of
  1. Principle I: Shaping flat fabric to conform to body curves requires reducing perimeter of garment pieces.
  2. Principle II: Manipulation of any given material is dependent upon component parts (structure and texture).
  3. Principle III: When concentric circles or arcs of different radii are used in clothing construction, certain adjustments in the circumferences are necessary.
  4. Principle IV: Choice of construction methods and techniques and choice of fabric are interrelated.
2. The amount of ease in the sleeve cap is dependent upon
  1. fabric.
  2. arm measurement.
  3. fashion.
  4. 1 and 3 of the above.
  5. 1, 2, and 3 of the above.
3. To insure ease in fit and construction the sleeve cap in the muslin has ease totaling
  1.  $1/2 - 3/4$  inch.
  2.  $1/2 - 1$  inch.
  3.  $1 - 1\ 1/2$  inches.
  4. none.
4. The notches or crossmarkings on the armseye of the sleeve pattern are
  1. the same on front as on back.
  2. not the same on front as on back.
  3. the same on every pattern.
5. The position of a sleeve in the armseye is most important because
  1. the bodice back has a deeper curve than bodice front.
  2. the bodice front has a deeper curve than the bodice back.
  3. of the grain position in relation to the arm.
  4. the sleeve back has a deeper curve.

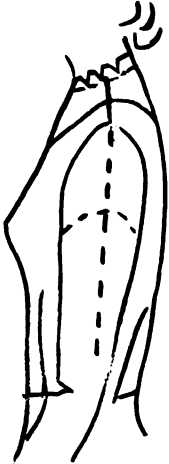
6. The armscye seam on a cotton dress with set-in sleeves is pressed
  1. toward the sleeve.
  2. away from the sleeve.
  3. open.
  4. flat together without direction.
  5. in none of the above ways.
7. The adjustment or reduction of the arc of the sleeve cap in a plain set-in sleeve is made by the use of
  1. gathers.
  2. ease.
  3. tucks.
  4. darts.
8. Which of the following sketches of sleeve caps show complete and correct markings for setting the sleeve into the bodice?



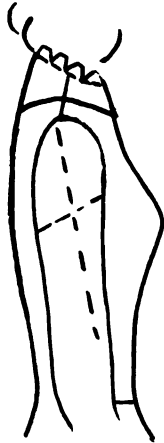
9. To reduce the arc of the sleeve cap, stitch 2 rows of machine basting: one row on staystitching line and the other  $\frac{1}{4}$  inch from first line within the seam allowance
  1. around the top of the sleeve between matching points.
  2. around the top of the sleeve between notches.
  3. around the bottom of the sleeve between matching points.
  4. all the way around the sleeve.
10. Ease should end near the top of the sleeve where the armscye line ceases to curve and follows the straight grain because
  1. extra length shows up as gathering or puckers on the straight grain.
  2. extra length shows up as gathering or puckers on the bias.
  3. ease is difficult to press.
  4. ease is unattractive at the top of the sleeve.
11. After a sleeve has been stitched into the armhole, the armscye seam is usually reinforced. Reinforcing is done by stitching
  1.  $\frac{1}{8}$  inch from seam line across top of sleeve between notches.
  2.  $\frac{1}{8}$  inch from seam line all the way around the sleeve.
  3.  $\frac{1}{8}$  inch from seam line across bottom of sleeve from notch to notch.
  4. the seam line again across bottom of sleeve from notch to notch.
12. Even distribution of ease in the cap of the sleeve is a desirable standard for set-in sleeves. Ease is distributed evenly by
  1. pulling the bobbin threads before crossmarkings are matched.

2. pulling the bobbin threads after crossmarkings are matched.
3. measuring the amount of ease and equally dividing it between crossmarkings.

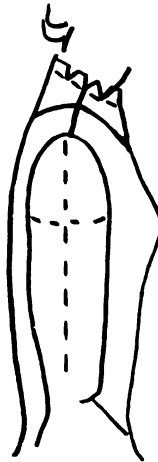
13. Which sleeve has the correct placement of train line?



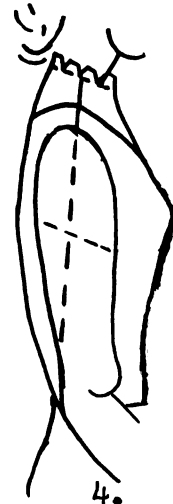
1.



2.



3.

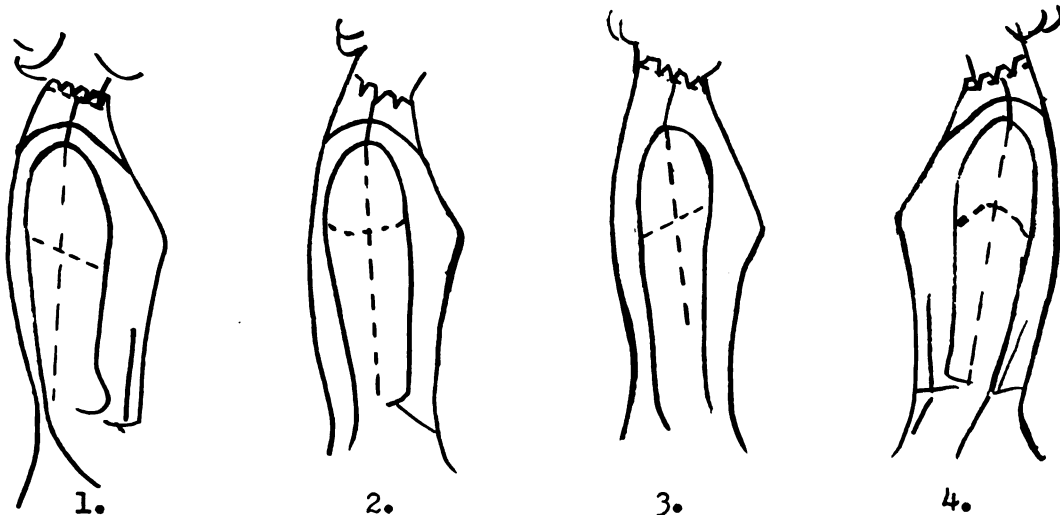


4.

## SET-IN SLEEVES POST-TEST

These questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures important in setting-in a sleeve. Work as rapidly as possible, as there is a 5 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on accepted department procedures. **SELECT THE CORRECT ANSWER AND FILL IN THE CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

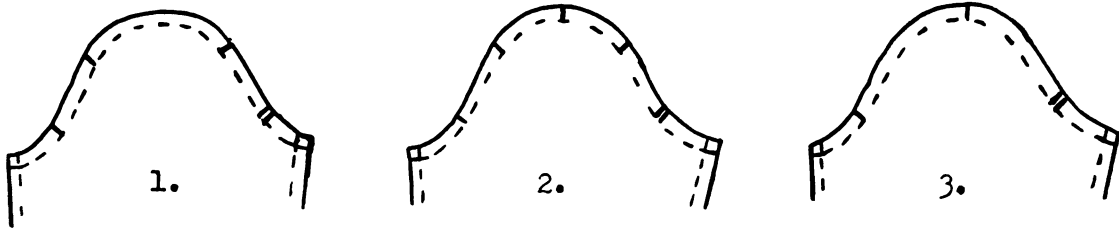
1. Which sleeve has the correct placement of grain line?



2. Even distribution of ease in the cap of the sleeve is a desirable standard for set-in sleeves. Ease is distributed evenly by
1. pulling the bobbin threads after crossmarkings are matched.
  2. measuring the amount of ease and equally dividing it between crossmarkings.
  3. pulling the bobbin threads before crossmarkings are matched.
3. After a sleeve has been stitched into the armhole, the armscye seam is usually reinforced. Reinforcing is done by stitching
1. the seam line again across bottom of sleeve from notch to notch.
  2. 1/8 inch from seam line across bottom of sleeve from notch to notch.
  3. 1/8 inch from seam line across top of sleeve between notches.
  4. 1/8 inch from seam line all the way around the sleeve.
4. Ease should end near the top of the sleeve where the armscye line ceases to curve and follows the straight grain because
1. ease is difficult to press.
  2. extra length shows up as gathering or puckers on the straight grain.
  3. ease is unattractive at the top of the sleeve.
  4. extra length shows up as gathering or puckers on the bias.



5. To reduce the arc of the sleeve cap, stitch 2 rows of machine basting: one row on staystitching line and the other  $\frac{1}{4}$  inch from first line within the seam allowance
1. around the top of the sleeve between matching points.
  2. all the way around the sleeve.
  3. around the bottom of the sleeve between matching points.
  4. around the top of the sleeve between notches.
6. Which of the following sketches of sleeve caps show complete and correct markings for setting the sleeve into the bodice?



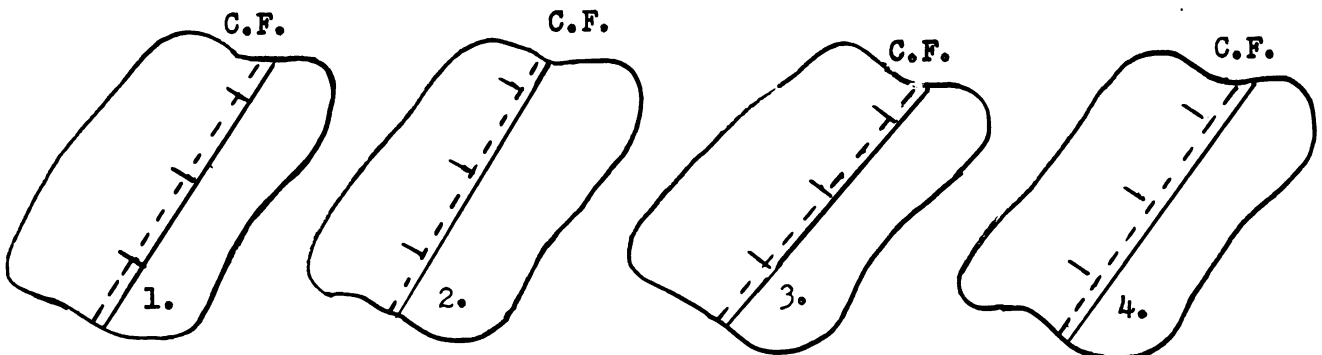
7. The adjustment or reduction of the arc of the sleeve cap in a plain set-in sleeve is made by the use of
1. gathers.
  2. ease.
  3. tucks.
  4. darts.
8. The armseye seam on a cotton dress with set-in sleeves is pressed
1. away from the sleeve.
  2. open.
  3. toward the sleeve.
  4. flat together without direction.
  5. in none of the above ways.
9. The position of a sleeve in the armseye is most important because
1. the sleeve back has a deeper curve,
  2. the bodice back has a deeper curve than bodice front.
  3. of the grain position in relation to the arm.
  4. the bodice front has a deeper curve than the bodice back.
10. The notches or crossmarkings on the armseye of the sleeve pattern are
1. insignificant.
  2. the same on every pattern.
  3. the same on front as on back.
  4. not the same on front as on back.
11. To insure ease in fit and construction the sleeve cap in the muslin has ease totaling
1.  $\frac{1}{2}$  inch - 1 inch.
  2.  $\frac{1}{2}$  inch -  $\frac{3}{4}$  inch.
  3. 1 inch -  $1\frac{1}{2}$  inches.
  4. none.

12. The amount of ease in the sleeve cap is dependent upon
  1. fashion.
  2. fabric.
  3. arm measurement.
  4. 1 and 2 of the above.
  5. 1, 2 and 3 of the above.
  
13. When setting-in a sleeve the easing of the sleeve cap into the arm-hole is an example of
  1. Principle I: Shaping flat fabric to conform to body curves requires reducing perimeter of garment pieces.
  2. Principle II: Manipulation of any given material is dependent upon component parts (structure and texture).
  3. Principle III: When concentric circles or arcs of different radii are used in clothing construction, certain adjustments in the circumferences are necessary.
  4. Principle IV: Choice of construction methods and techniques and choice of fabric are interrelated.

## GARMENT CLOSURES PRE-TEST

These questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures pertaining to garment closures. Work as rapidly as possible as there is a 7 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on accepted departmental procedures. **SELECT THE CORRECT ANSWER AND FILL IN THE CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

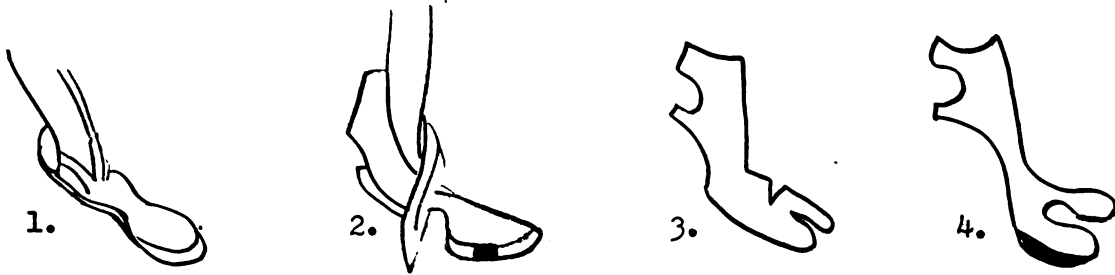
1. When sewing on a button, the purpose of a shank is
  1. to prevent the fabric from tearing.
  2. to provide room for the thickness of the right front.
  3. to add height to the button.
  4. to prevent the buttonhole from stretching in length.
2. A thread shank can be made by
  1. placing a match under or on top of the button while sewing on the button.
  2. laying the fabric and button on their side while sewing on the button.
  3. sewing the button on very loosely.
  4. raising the button while sewing and winding the thread around the stitches before securing the thread.
3. Jane is making a dress with buttons down the center front. The correct placement of the buttons would be
  1.  $\frac{1}{8}$  inch to the left of the center front.
  2. directly on the center front.
  3.  $\frac{1}{8}$  inch to the right of the center front.
  4.  $\frac{1}{2}$  of the button width from the front bodice edge.
4. Which buttonholes for the above dress would be placed correctly?



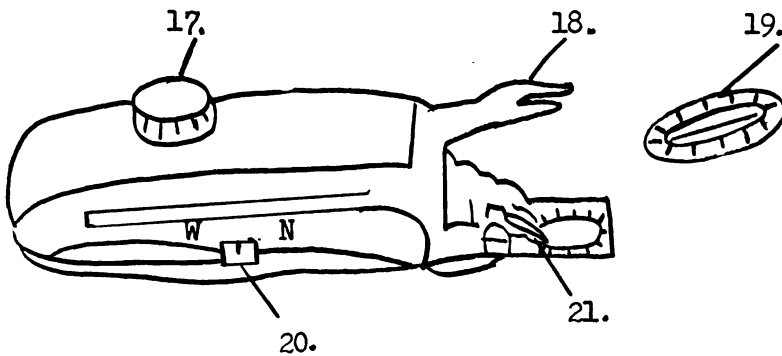
5. The length of a machine made buttonhole is determined by
  1. width of the button.
  2. width and thickness of the button.
  3. width of the button plus  $\frac{1}{8}$  inch.
  4. width and thickness of the button plus  $\frac{1}{8}$  inch.

6. Buttonholes are most often placed at right angles to the center front and the finished front edge because
  1. the buttonholes will be parallel to the front edge.
  2. it is easier to button.
  3. the front will be held securely even if the garment is snugly fitted.
  4. it is determined by fashion.
7. Sally is making a dress with an 18 inch center back slide fastener. She has chosen the lapped application method. Which side of the dress back would be most suitable for the lap and why?
  1. left side, because she is right handed.
  2. right side, because she is left handed.
  3. either side is suitable.
  4. left side, because it is most often chosen.
8. The reason or reasons for the manufacturer placing guide lines for stitching on the slide fastener tape is
  1. to ensure straight stitching.
  2. to provide adequate space between stitching lines and the coil.
  3. to permit easy movement of the slider.
  4. all of the above.
9. Nylon slide fasteners are a comparatively new product on the market. Which statement concerning the characteristics of nylon slide fasteners is false?
  1. Nylon slide fasteners are lighter in weight than metal slide fasteners.
  2. Nylon slide fasteners are chemical resistant.
  3. Nylon slide fasteners are heat resistant.
  4. Nylon slide fasteners are self-healing.
- 10-14. Place the following in the correct order of procedure for the lapped slide fastener application method.
  1. Place slide fastener face down, stitch across bottom and along length of slide fastener.
  2. Baste-stitch opened fastener to one seam allowance using cording foot.
  3. Close placket with machine basting and press seam open.
  4. Remove seamline basting and press if necessary.
  5. Close slide fastener, turn face up making narrow fold in seam allowance, and edge-stitch on fold.
15. Upon final inspection of the lap covering the slide fastener, Mary noticed the material did not lay smooth. This may have been caused by
  1. stitching in different directions.
  2. improper pressing.
  3. two seams being of unequal length.
  4. all of the above.
  5. 1 and 3 of the above.

16. Which is a cording foot?



17-21. The function of each numbered part of the buttonholer is

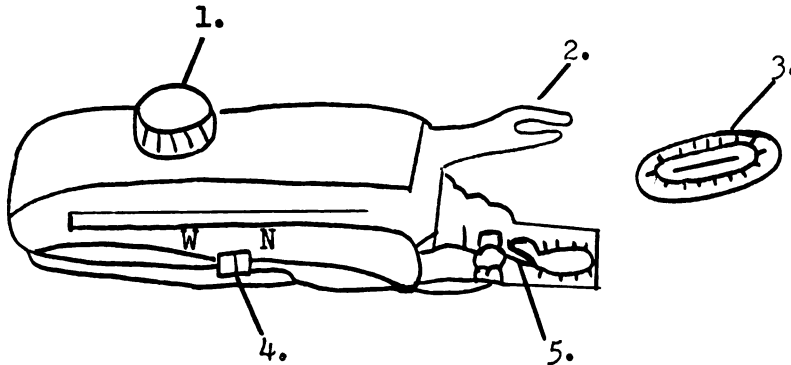


1. to hold fabric firmly as stitches are taken.
2. to straddle needle clamp to actuate attachment.
3. to control size and shape of buttonholes.
4. to locate cloth clamp or position buttonhole.
5. to determine the width of side stitch or bight.

## GARMENT CLOSURES POST-TEST

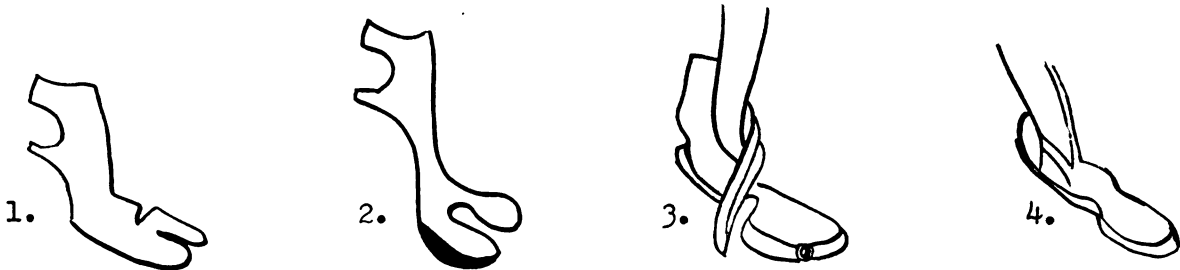
These questions will have no affect on the grade you receive in this course. The purpose of these questions is to determine your ability to select specific procedures pertaining to garment closures. Work as rapidly as possible as there is a 7 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on accepted departmental procedures. **SELECT THE CORRECT ANSWER AND FILL IN THE CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

1-5. The function of each numbered part of the buttonholer is



1. to hold fabric firmly as stitches are taken.
2. to determine the width of side stitch or bight.
3. to locate cloth clamp or position buttonhole.
4. to control size and shape of buttonholes.
5. to straddle needle clamp to actuate attachment.

6. Which is a cording foot?



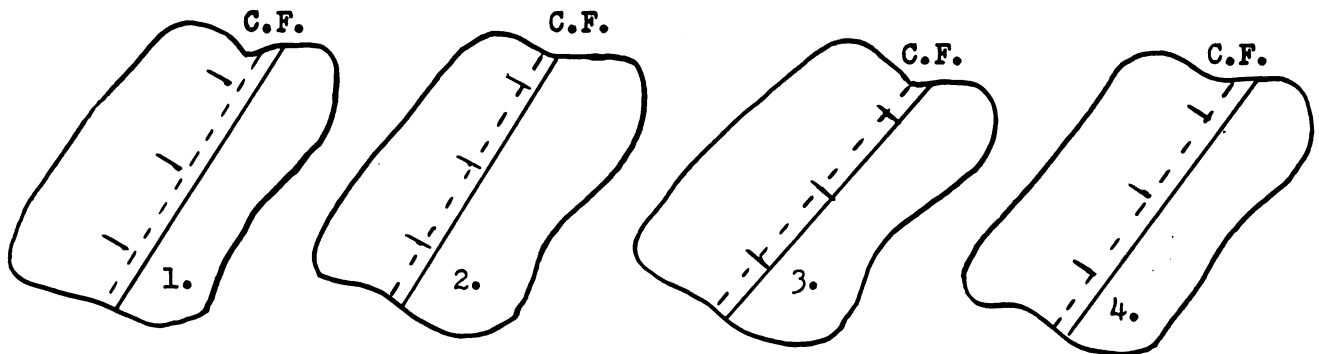
7. Upon final inspection of the lap covering the slide fastener, Mary noticed the material did not lay smooth. This may have been caused by
1. two seams being of unequal length.
  2. stitching in different directions.
  3. improper pressing.
  4. all of the above.
  5. 1 and 3 of the above.

8-12. Place the following in the correct order of procedure for the lapped slide fastener application method.

1. Close slide fastener, turn face up making narrow fold in seam allowance, and edge-stitch on fold.
2. Baste-stitch opened fastener to one seam allowance using cording foot.

3. Place slide fastener face down, stitch across bottom and along length of slide fastener.
  4. Close placket with machine basting and press seam open.
  5. Remove seamline basting and press if necessary.
13. Nylon slide fasteners are a comparatively new product on the market. Which statement concerning the characteristics of nylon slide fasteners is false?
1. Nylon slide fasteners are self-healing.
  2. Nylon slide fasteners are chemical resistant.
  3. Nylon slide fasteners are lighter in weight than metal slide fasteners.
  4. Nylon slide fasteners are heat resistant.
14. The reason or reasons for the manufacturer placing guide lines for stitching on the slide fastener tape is
1. to permit easy movement of the slider.
  2. to ensure straight stitching,
  3. to provide adequate space between stitching lines and the coil,
  4. all of the above.
15. Sally is making a dress with an 18 inch center back slide fastener. She has chosen the lapped application method. Which side of the dress back would be most suitable for the lap and why?
1. right side, because she is left handed.
  2. either side is suitable.
  3. left side, because she is right handed.
  4. left side, because it is most often chosen.
16. Buttonholes are most often placed at right angles to the center front and the finished front edge because
1. the front will be held securely even if the garment is snugly fitted.
  2. it is determined by fashion.
  3. it is easier to button.
  4. the buttonholes will be parallel to the front edge.
17. The length of a machine made buttonhole is determined by
1. width and thickness of the button plus  $1/8$  inch.
  2. width of the button plus  $1/8$  inch.
  3. width and thickness of the button.
  4. width of the button.

18. Jane is making a dress with buttons down the center front. The correct placement of the buttons would be
1.  $1/2$  of the button width from the front bodice edge.
  2.  $1/8$  inch to the right of the center front.
  3. directly on the center front.
  4.  $1/8$  inch to the left of the center front.
19. A thread shank can be made by
1. sewing the button on very loosely.
  2. laying the fabric and button on their side while sewing on the button.
  3. raising the button while sewing and winding the thread around the stitches before securing the thread.
  4. placing a match under or on top of the button while sewing on the button.
20. When sewing on a button, the purpose of a shank is
1. to prevent the fabric from tearing.
  2. to prevent the buttonhole from stretching in length.
  3. to provide room for the thickness of the right front.
  4. to add height to the button.
21. Which buttonholes for the above dress would be placed correctly?



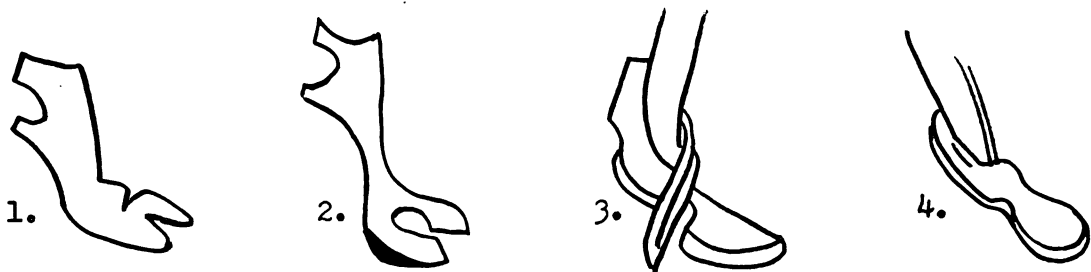


## RETENTION TEST

These questions will have no effect on the grade you receive in this course. The purpose of these questions is to determine how much you remembered from the demonstrations concerning pattern layout, sleeves, and garment closures. Work as rapidly as possible as there is a 20 minute time limit. Please answer all the questions as best you can. The correct answer for each question is based on accepted departmental procedures. **SELECT THE CORRECT ANSWER AND FILL IN THE CORRESPONDING SPACE ON YOUR ANSWER SHEET.**

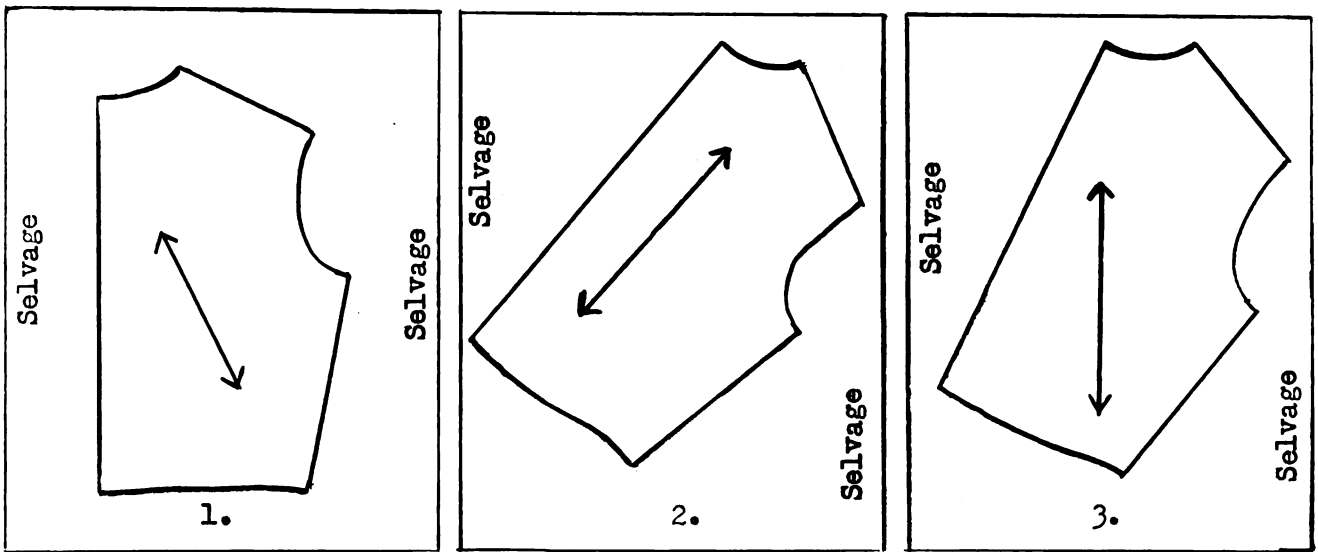
1. In order to determine the layout that should be used from the pattern guide sheet, it is necessary to know
  1. pattern number, size of pattern and width of fabric.
  2. size of pattern, width of fabric and style version.
  3. width of fabric, amount of material purchased and size of pattern.
  4. pattern number, size of pattern and style version.
2. When setting-in a sleeve the easing of the sleeve cap into the arm-hole is an example of
  1. Principle I: Shaping flat fabric to conform to body curves requires reducing perimeter of garment pieces,
  2. Principle II: Manipulation of any given material is dependent upon component parts (structure and texture).
  3. Principle III: When concentric circles or arcs of different radii are used in clothing construction, certain adjustments in circumferences are necessary.
  4. Principle IV: Choice of construction methods and techniques and choice of fabric are interrelated.
- 3-7. Place the following in the correct order of procedure for the lapped slide fastener application method:
  1. Place slide fastener face down, stitch across bottom and along length of slide fastener.
  2. Baste-stitch opened fastener to one seam allowance using cording foot.
  3. Close placket with machine basting and press seam open.
  4. Remove seamline basting and press if necessary.
  5. Close slide fastener, turn face up making narrow fold in seam allowance, and edge-stitch on fold.
8. The amount of ease in the sleeve cap is a dependent upon
  1. fabric.
  2. arm measurement.
  3. fashion.
  4. 1 and 3 of the above.
  5. 1, 2, and 3 of the above.
9. Buttonholes are most often placed at right angles to the center front and the finished front edge because
  1. the buttonhole will be parallel to the front edge.

2. it is easier to button.
  3. the front will be held securely even if the garment is snugly fitted.
  4. it is determined by fashion.
10. Ease should end near the top of the sleeve where the armseye line ceases to curve and follows the straight grain because
1. extra length shows up as gathering or puckers on the straight grain.
  2. extra length shows up as gathering or puckers on the bias.
  3. ease is difficult to press.
  4. ease is unattractive at the top of the sleeve.
11. Upon final inspection of the lap covering the slide fastener, Mary noticed the material did not lay smooth. This may have been caused by
1. stitching in different directions.
  2. improper pressing.
  3. two seams being of unequal length.
  4. all of the above.
  5. 1 and 3 of the above.
12. In working with muslin master patterns, markings are made on both the wrong and right sides of the fabric to facilitate fitting. Which of the following markings should appear on the wrong side of the muslin?
1. seam lines, darts, tucks, pleats, skirt hem line, crossmarkings.
  2. center front, seams, darts, crossmarkings.
  3. crossmarkings, grain line at bust level, center back, seams and darts.
  4. darts, crossmarkings, seam lines and sleeve cap seamline.
13. Which is a cording foot?



14. When laying a pattern piece on the material, lengthwise grain is established by measuring from
1. cutting line to selvage.
  2. center front or center back to the selvage.
  3. middle of the grain marking to the selvage.
  4. each end of the extended pattern grain line to the selvage.
15. The position of a sleeve in the armseye is most important because
1. the bodice back has a deeper curve than bodice front.
  2. the bodice front has a deeper curve than the bodice back.

3. of the grain position in relation to the arm.
  4. the sleeve back has a deeper curve.
16. Jane is making a dress with buttons down the center front. The correct placement of the buttons would be
1.  $\frac{1}{8}$  inch to the left of the center front.
  2. directly on the center front.
  3.  $\frac{1}{8}$  inch to the right of the center front.
  4.  $\frac{1}{2}$  of the button width from the front bodice edge.
17. The adjustment or reduction of the arc of the sleeve cap in a plain set-in sleeve is made by the use of
1. gathers.
  2. ease.
  3. tucks.
  4. darts.
18. The fit of a garment is very dependent upon the placement of grain. Which of the following bodices is laid on the fabric correctly?

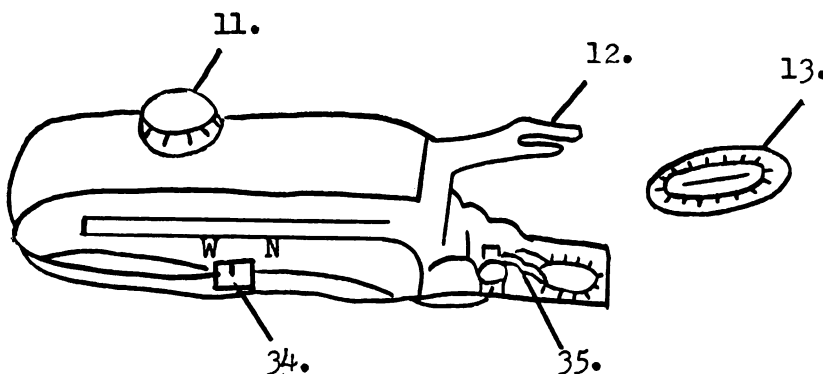


19. Sally is making a dress with an 18 inch center back slide fastener. She has chosen the lapped application method. Which side of the dress back would be most suitable for the lap and why?
1. left side, because she is right handed.
  2. right side, because she is left handed.
  3. either side is suitable.
  4. left side, because it is most often chosen.
20. Seam lines which are most likely to be adjusted during fitting should be cut with generous seam allowances. In the pattern layout, the following seams should be increased to 1 inch: shoulder, skirt side,

1. waistlines, neck, sleeve cap and underarm.
  2. center back of skirt and bodice, underarm, armscye and waistlines.
  3. underarm, waistlines, sleeve underarm, and center back of skirt and bodice.
  4. sleeve underarm, waistlines, armscye and neck.
21. To reduce the arc of the sleeve cap, stitch 2 rows of machine basting: one row on staystitching line and the other  $\frac{1}{4}$  inch from the first line within the seam allowance
1. around the top of the sleeve between matching points.
  2. around the top of the sleeve between notches.
  3. around the bottom of the sleeve between matching points.
  4. all the way around the sleeve.
22. When pinning a pattern to the fabric, the pins should be placed
1. parallel to the grain pointing toward the cutting line.
  2. perpendicular to the grain pointing toward cutting line
  3. perpendicular to the cutting line.
  4. within the seam allowance, parallel to the cutting line.
23. The length of a machine made buttonhole is determined by
1. width of the button.
  2. width and thickness of the button.
  3. width of the button plus  $\frac{1}{8}$  inch.
  4. width and thickness of the button plus  $\frac{1}{8}$  inch.
24. Even distribution of ease in the cap of the sleeve is a desirable standard for set-in sleeves. Ease is distributed evenly by
1. pulling the bobbin threads before crossmarkings are matched.
  2. pulling the bobbin threads after crossmarkings are matched.
  3. measuring the amount of ease and equally dividing it between crossmarkings.
25. To locate the grain of the fabric, uneven ends of the fabric may be straightened by
1. tearing across the fabric.
  2. pulling a thread across the fabric.
  3. following a printed design across the fabric.
  4. 1 and 2 of the above.
  5. all of the above.
26. When sewing on a button, the purpose of a shank is
1. to prevent the fabric from tearing.
  2. to provide room for the thickness of the right front.
  3. to add height to the button.
  4. to prevent the buttonhole from stretching in length.
27. After a sleeve has been stitched into the armhole, the armscye seam is usually reinforced. Reinforcing is done by stitching
1.  $\frac{1}{8}$  inch from seam line across top of sleeve between notches.

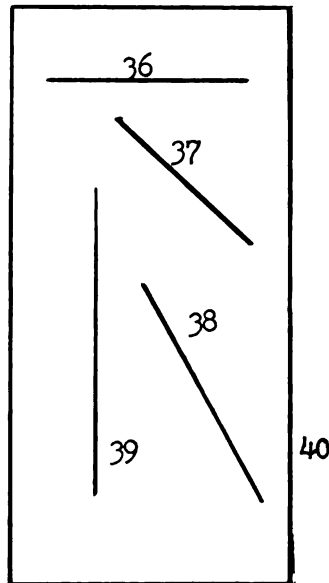
2. 1/8 inch from seam line all the way around the sleeve.
  3. 1/8 inch from seam line across bottom of sleeve from notch to notch.
  4. the seam line again across bottom of sleeve from notch to notch.
28. Nylon slide fasteners are a comparatively new product on the market. Which statement concerning the characteristics of nylon slide fasteners is false?
1. Nylon slide fasteners are lighter in weight than metal slide fasteners.
  2. Nylon slide fasteners are chemical resistant.
  3. Nylon slide fasteners are heat resistant.
  4. Nylon slide fasteners are self-healing.
29. A thread shank can be made by
1. placing a match under or on top of the button while sewing on the button.
  2. laying the fabric and button on their side while sewing on the button.
  3. sewing the button on very loosely.
  4. raising the button while sewing and winding the thread around the stitches before securing the thread.
30. The armscye seam on a cotton dress with set-in sleeves is pressed
1. toward the sleeve.
  2. away from the sleeve.
  3. open.
  4. flat together without direction.
  5. in none of the above ways.

31-35. The function of each numbered part of the buttonholer is



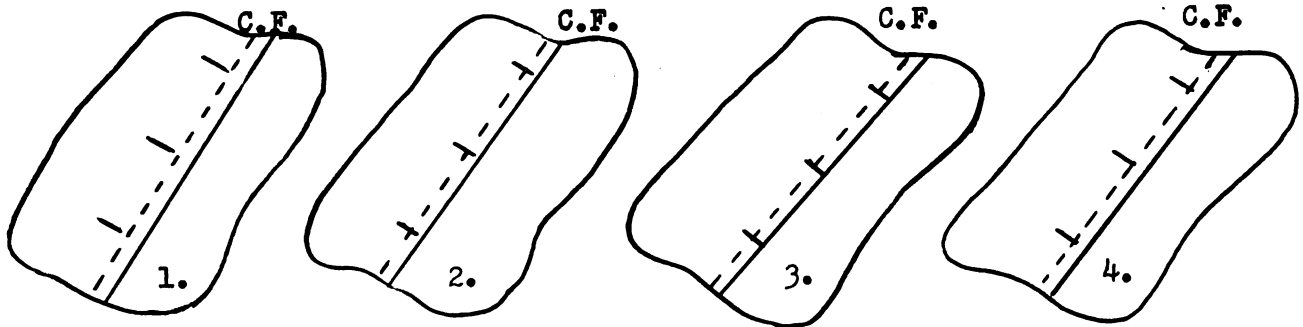
1. to hold fabric firmly as stitches are taken
2. to straddle needle clamp to actuate attachment
3. to control size and shape of buttonholes
4. to locate cloth clamp or position buttonhole
5. to determine the width of side stitch or bight

- 36-40. The rectangle below represents 2 yards of 36 inch material.  
MATCH THE FOLLOWING by selecting the correct answer and filling in the corresponding space on your answer sheet.

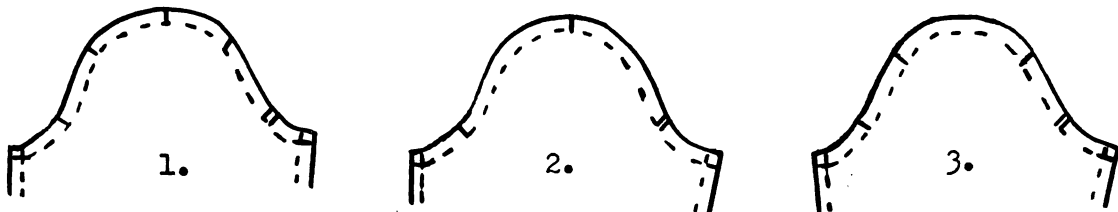


1. lengthwise grain
2. crosswise grain
3. selvage
4. true bias
5. bias

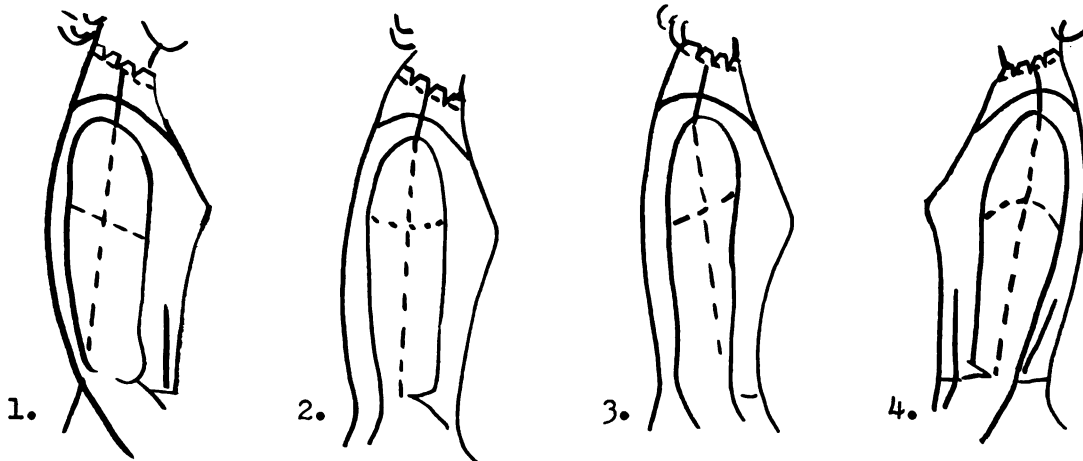
41. Which buttonholes for the above dress would be placed correctly?



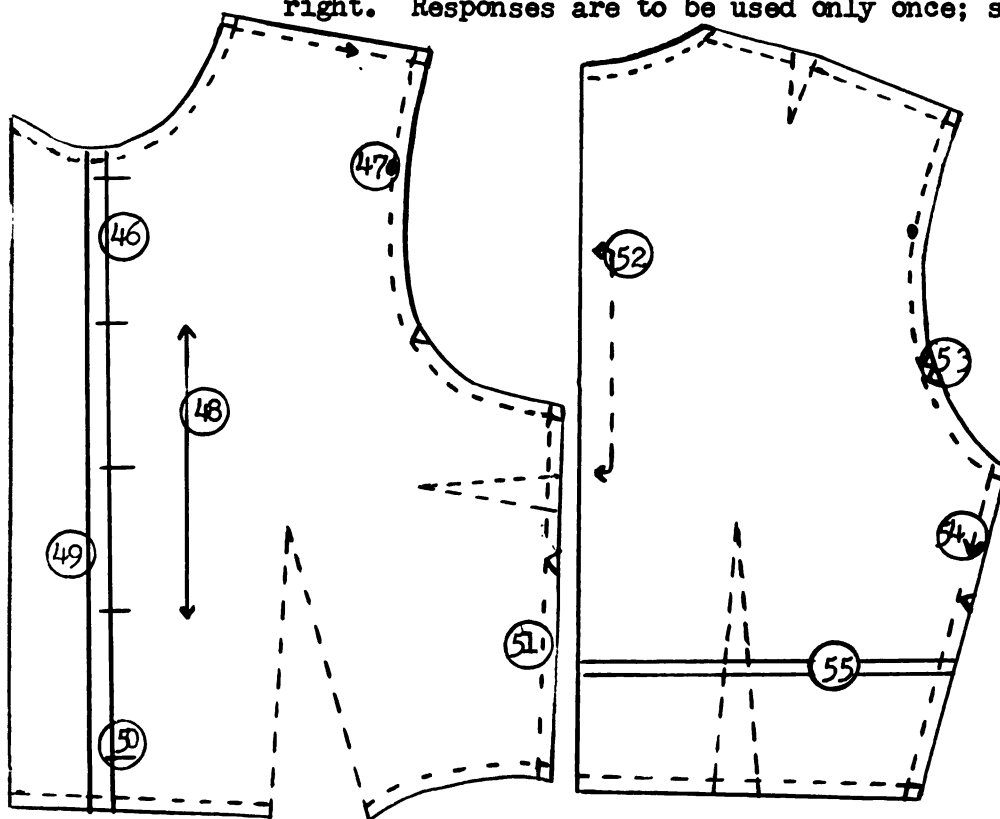
42. To straighten distorted fabric, the shorter end of the fabric is
1. stretched on the straight of the goods in opposite direction until the lengthwise threads are parallel with the selvages.
  2. stretched on the true bias in opposite direction until the crosswise threads are squared with the selvages.
  3. either of the above.
  4. neither of the above.
43. Which of the following sketches of sleeve caps show complete and correct markings for setting the sleeve into the bodice?



44. The reason or reasons for the manufacturer placing guide lines for stitching on the slide fastener tape is
1. to ensure straight stitching.
  2. to provide adequate space between stitching lines and the coil.
  3. to permit easy movement of the slider.
  4. all of the above.
45. Which sleeve has the correct placement of grain line?



- 46-55. Illustrations of two pattern pieces are shown, each bearing certain pattern markings with the number of the questions on them. Select only the one best answer for each question from the list on the right. Responses are to be used only once; some may not be used.



#### Responses

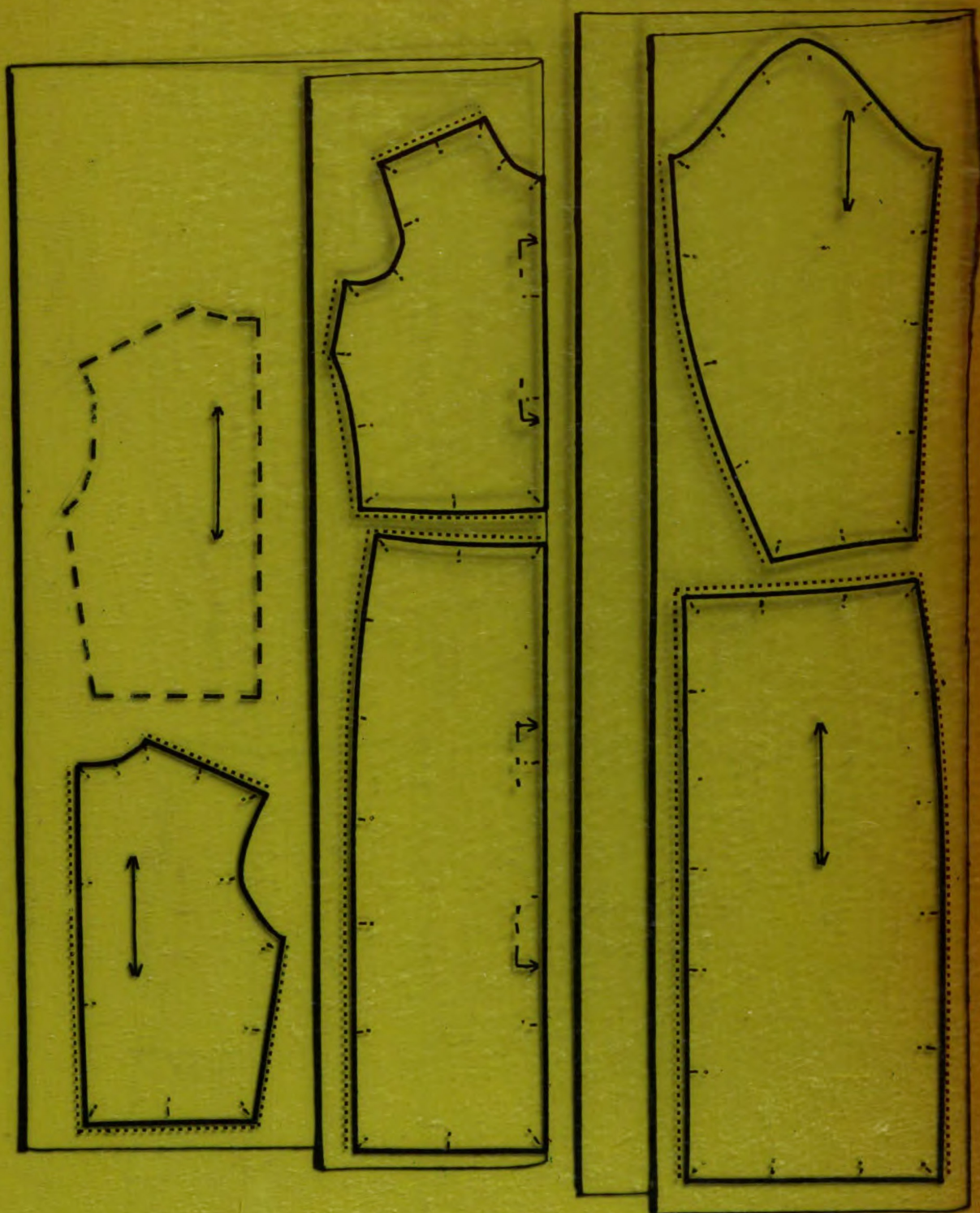
1. mark indicating grain line of material
2. buttonhole
3. direction of stitching
4. cutting line
5. alteration line
6. seam line
7. fold for facing
8. center front
9. notches for matching
10. matching points
11. place on fold of material
12. easing

56. To insure ease in fit and construction, the sleeve cap in the muslin has ease totaling
1.  $1/2 - 3/4$  inch.
  2.  $1/2 - 1$  inch.
  3.  $1 - 1\ 1/2$  inches.
  4. none.
57. The notches or crossmarkings on the armseye of the sleeve pattern are
1. the same on front as on back.
  2. not the same on front as on back.
  3. the same on every pattern.

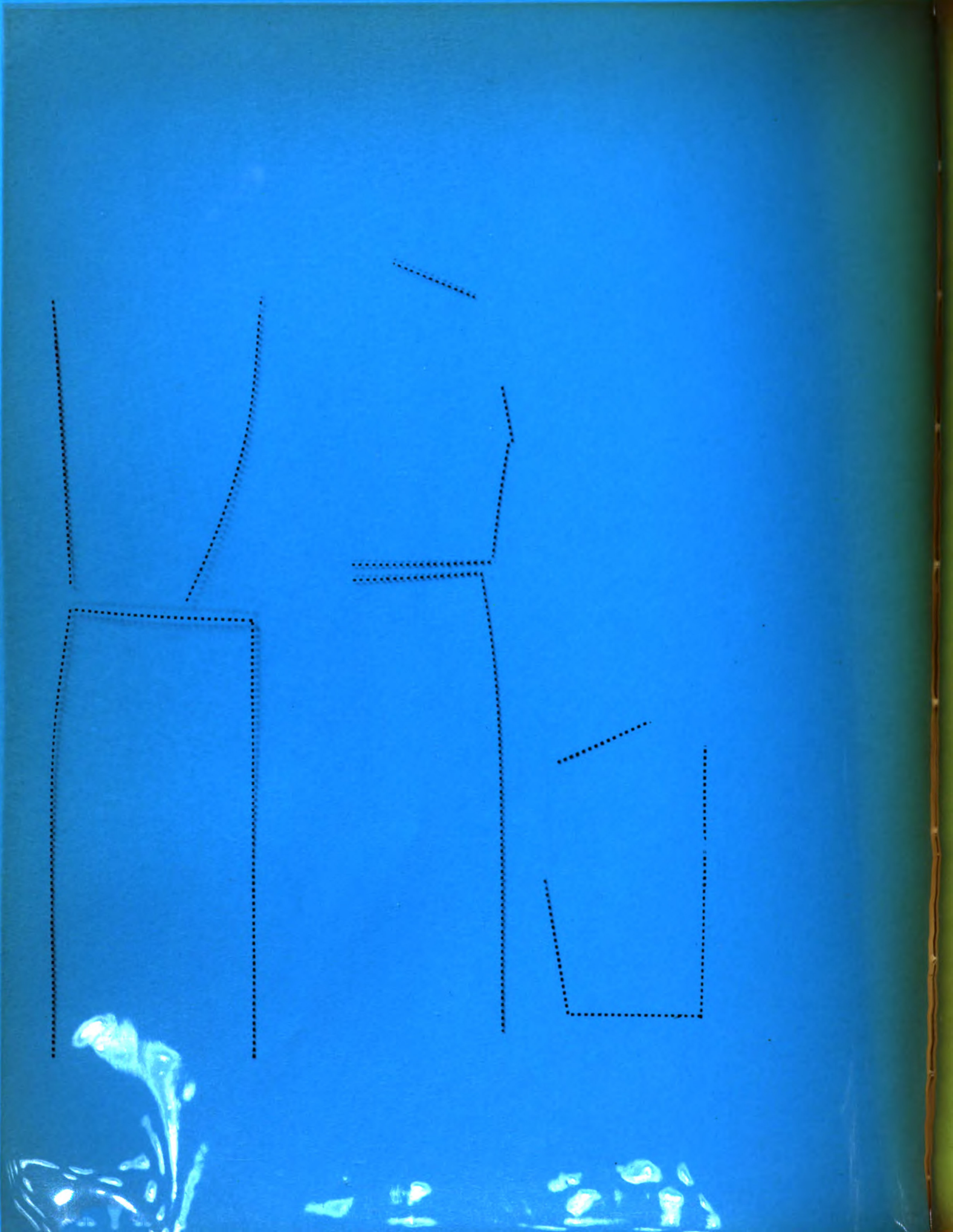


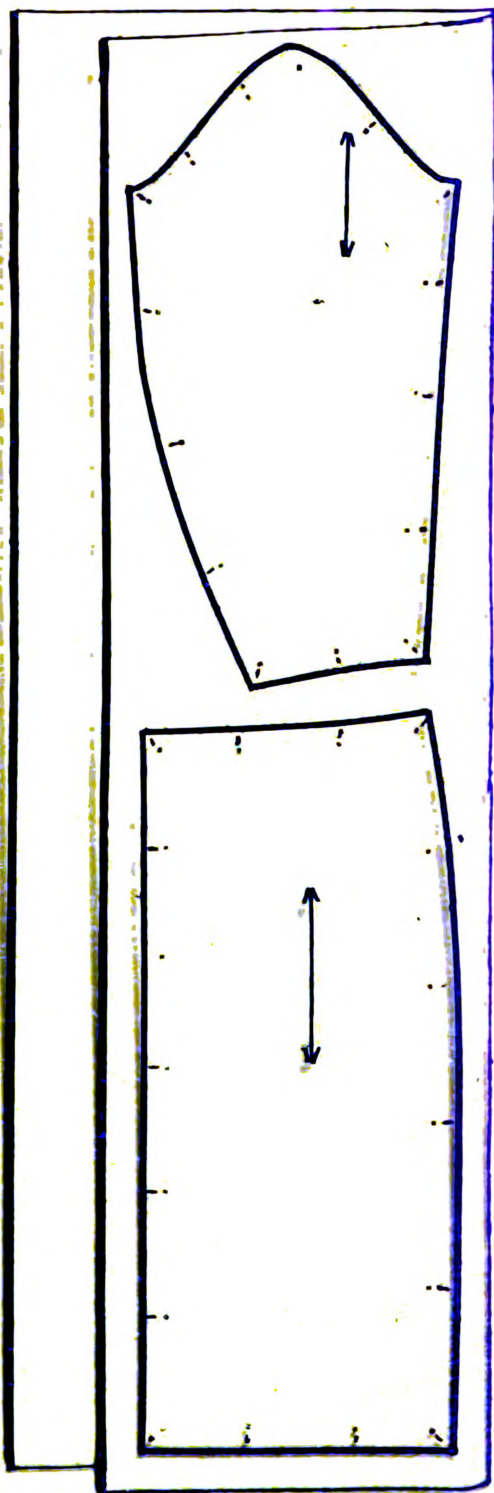
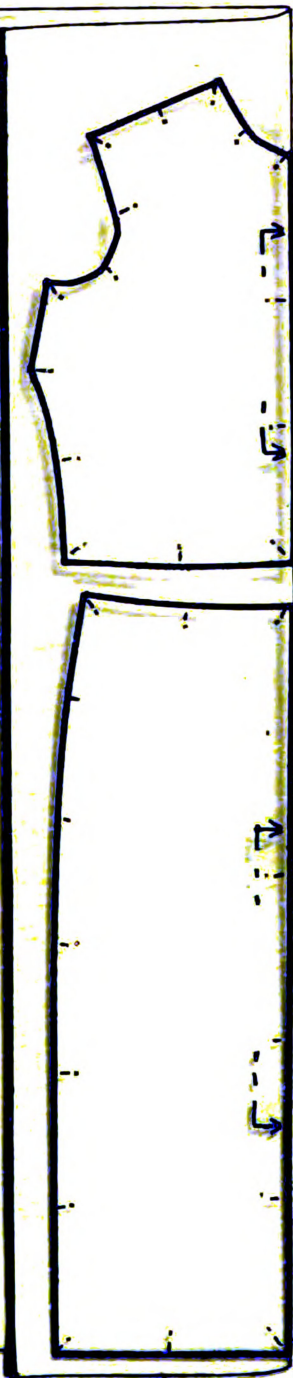
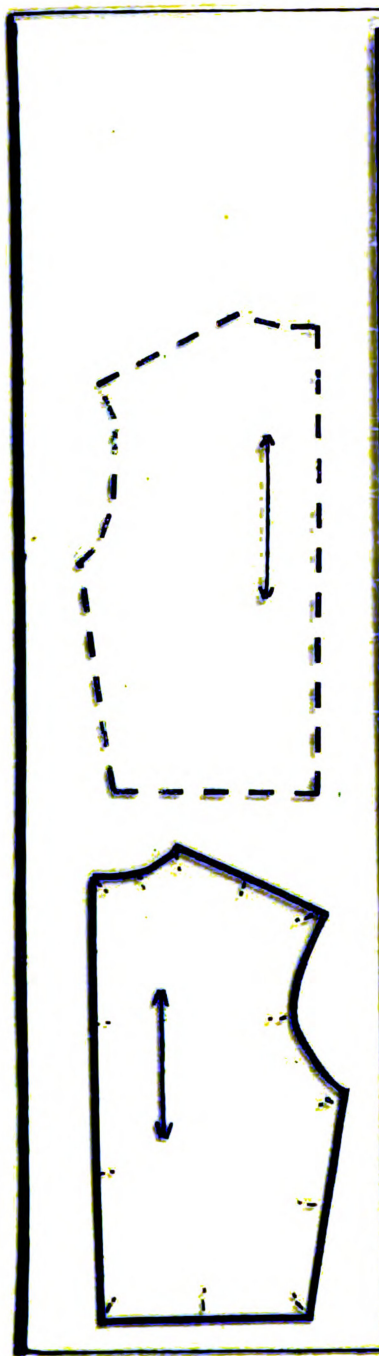
## **APPENDIX B**

### **Transparency Copies**

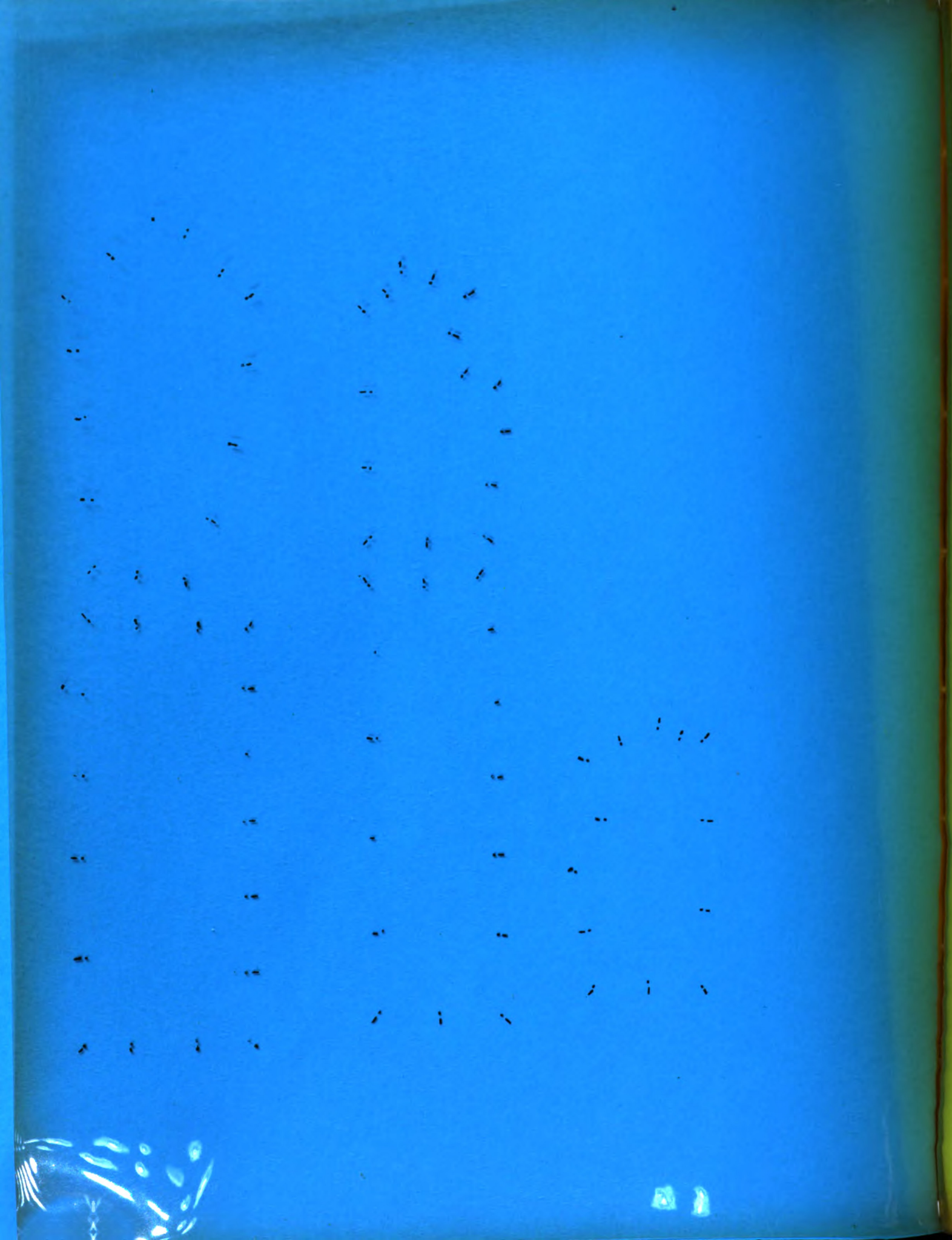


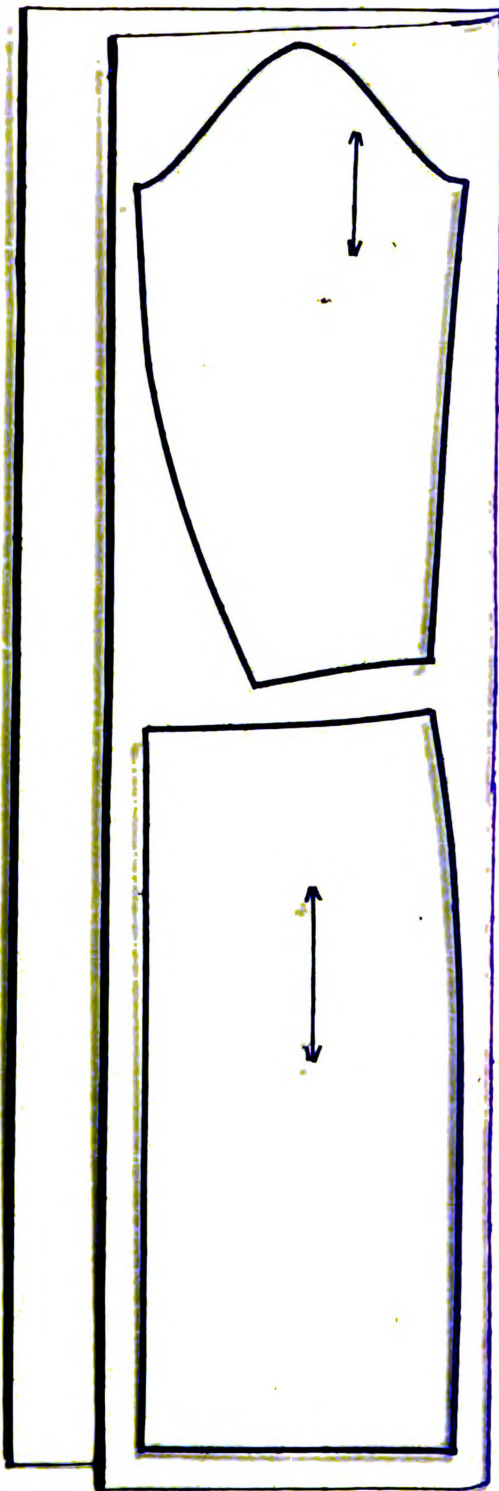
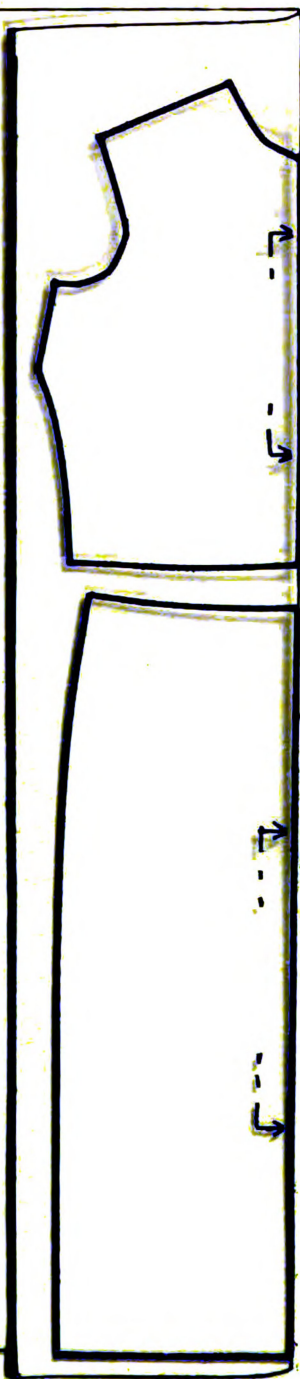
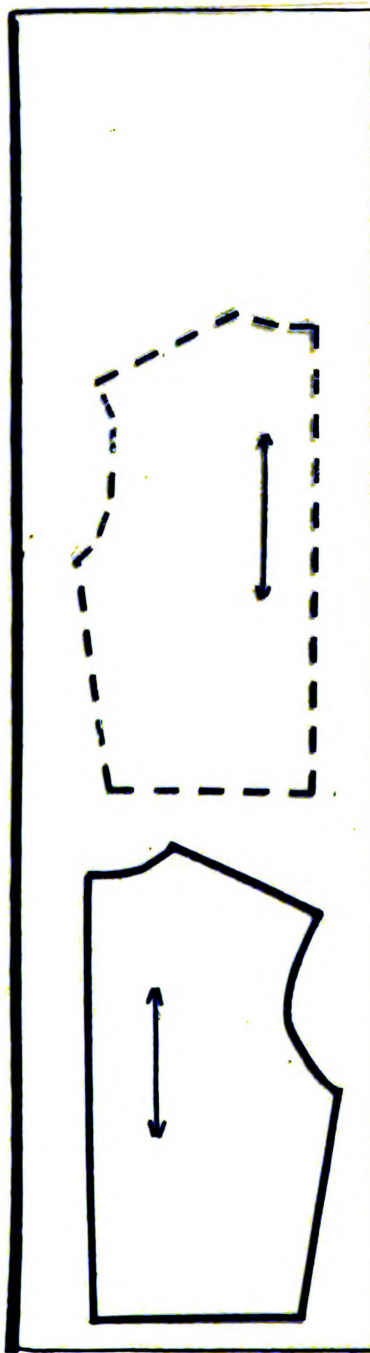




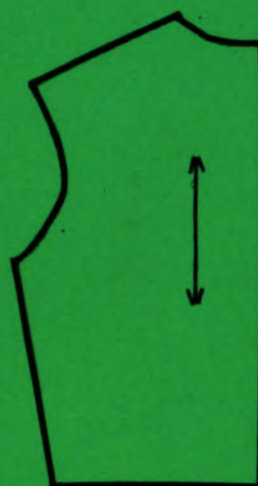
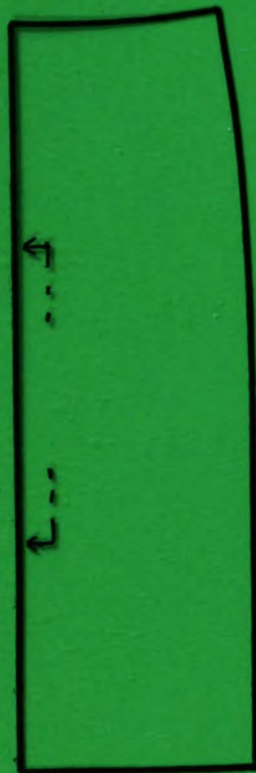
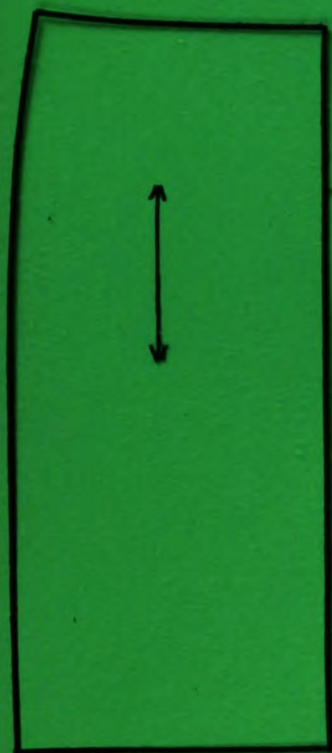
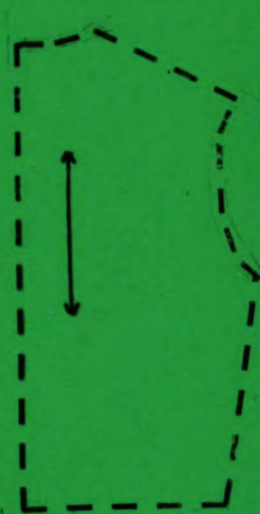
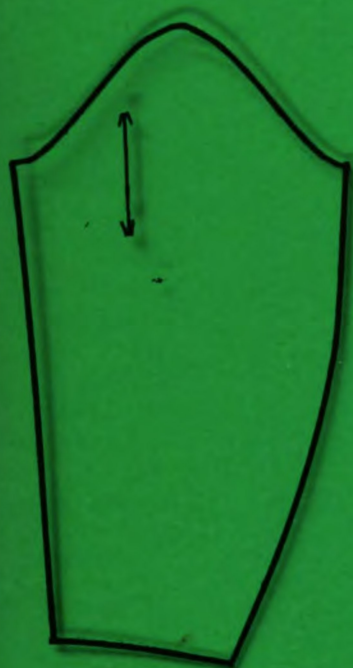




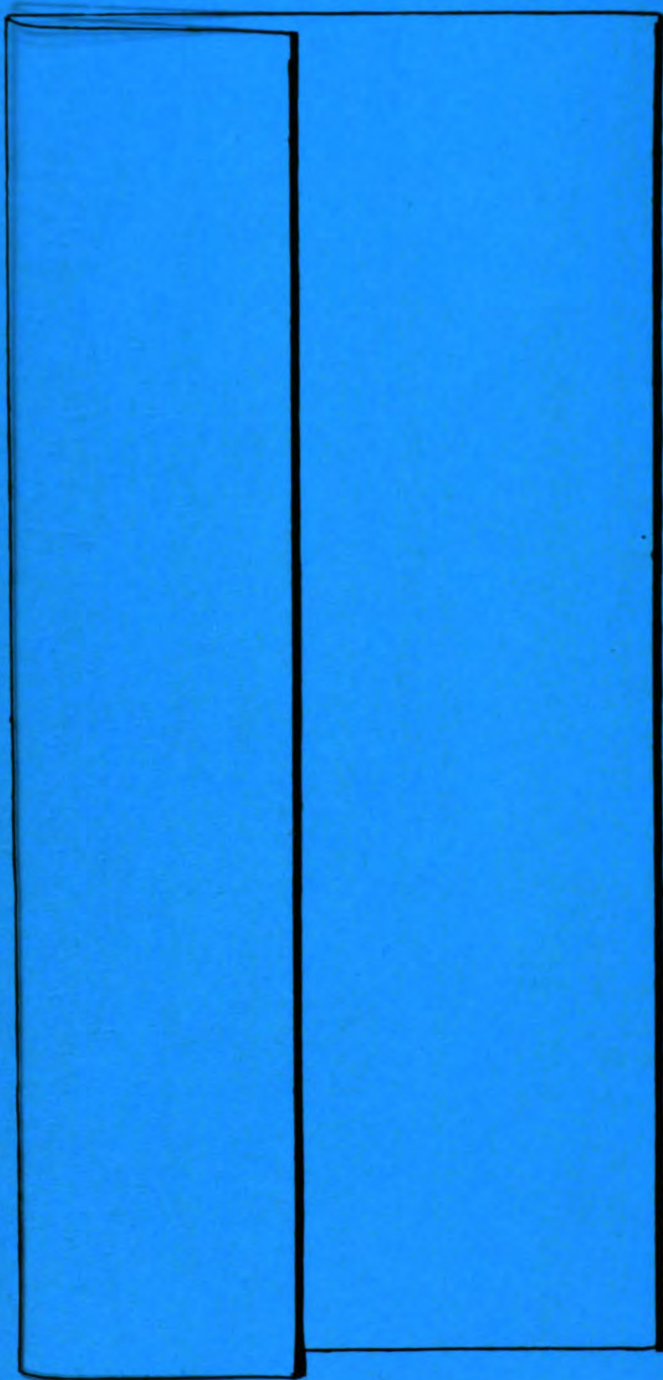
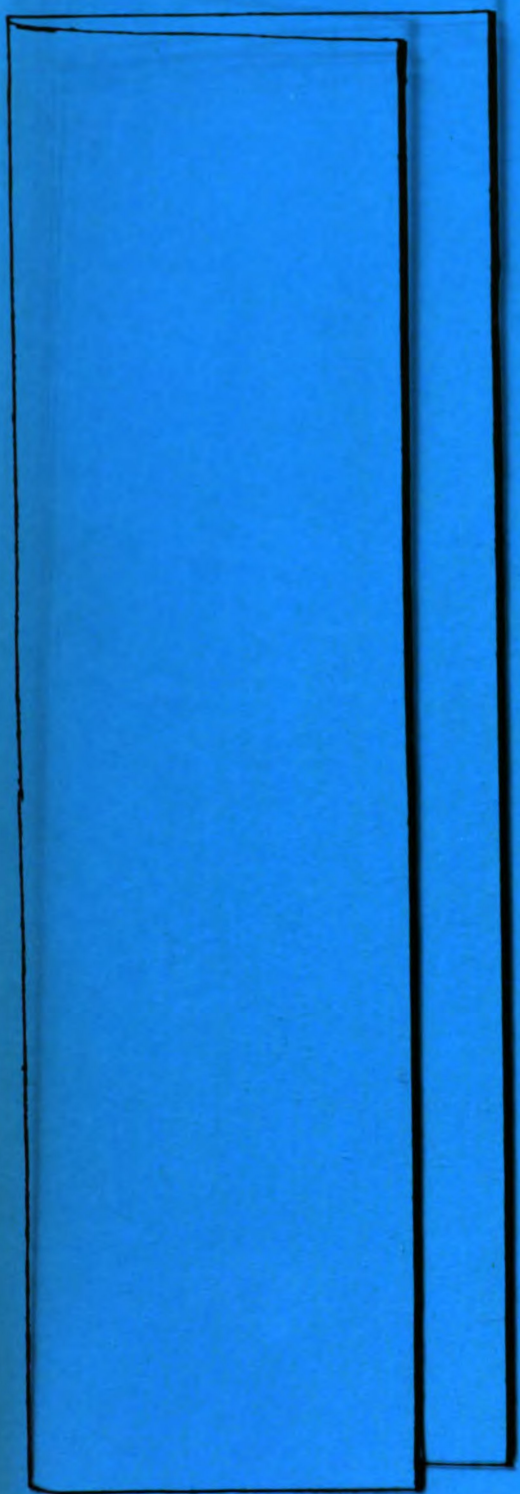








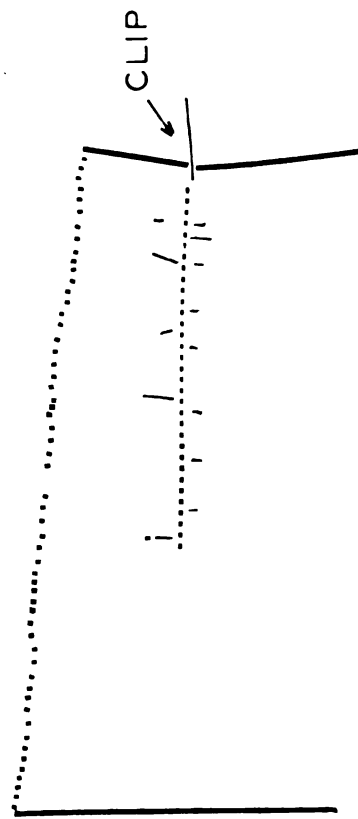






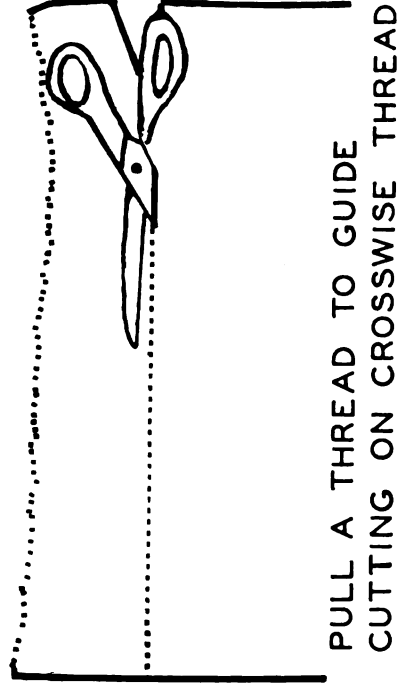
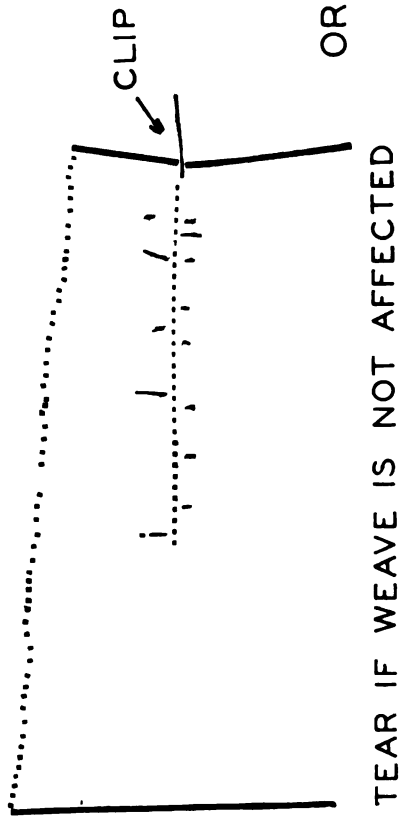
10

## PREPARING THE FABRIC

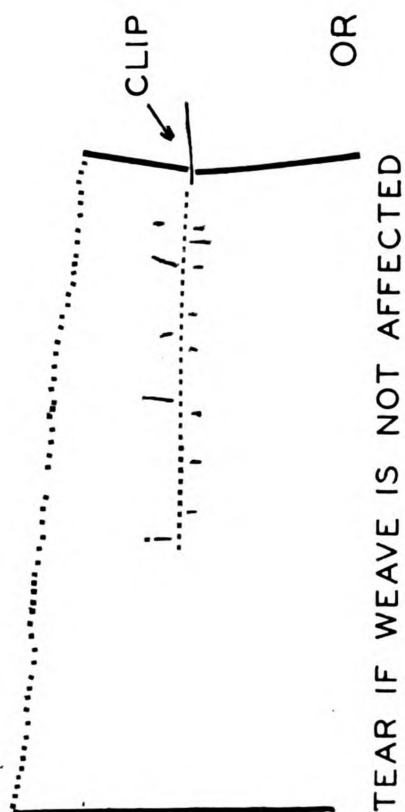


TEAR IF WEAVE IS NOT AFFECTED

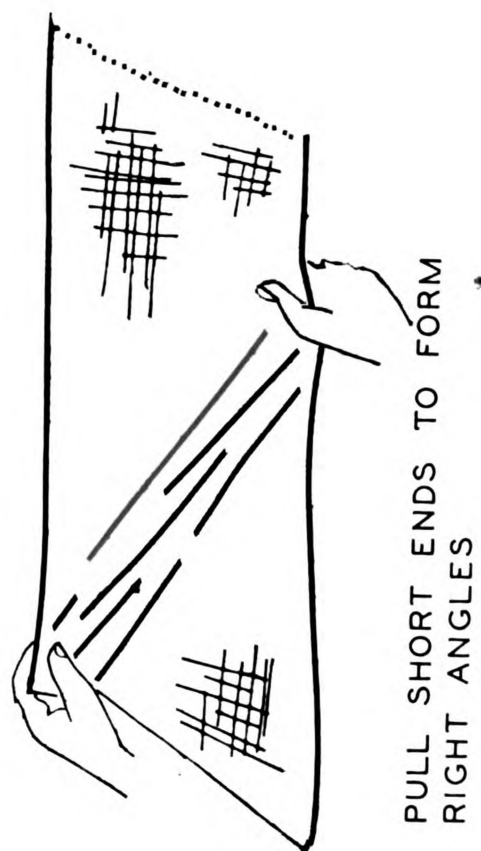
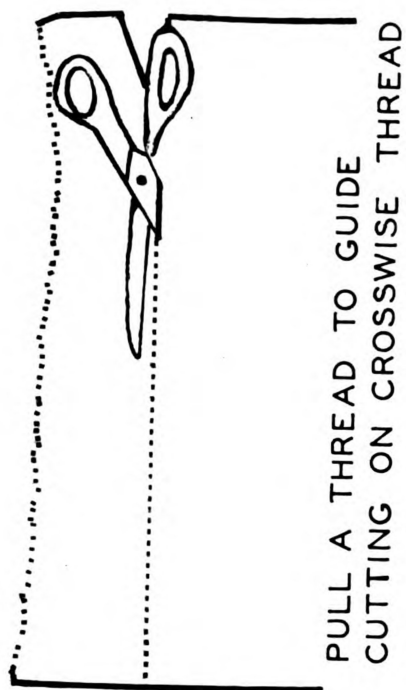
## PREPARING THE FABRIC



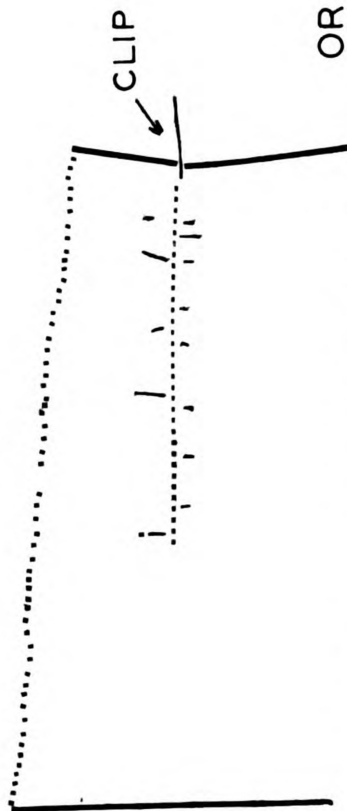
# PREPARING THE FABRIC



TEAR IF WEAVE IS NOT AFFECTED

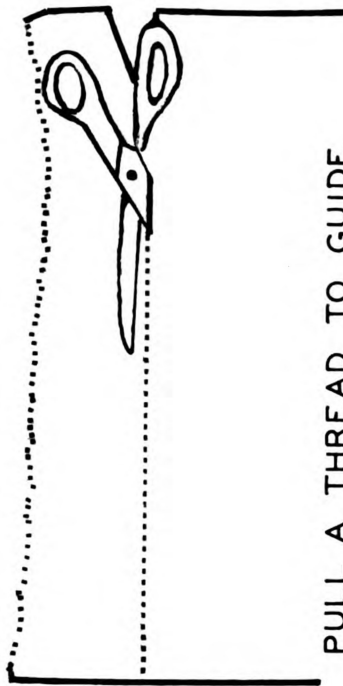


# PREPARING THE FABRIC

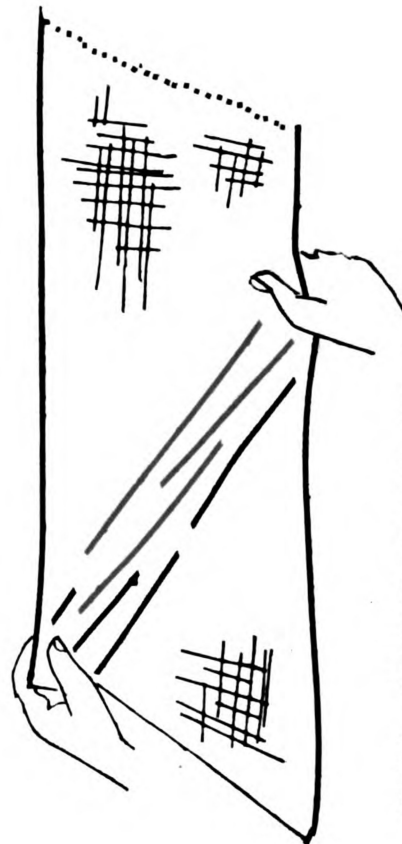


OR

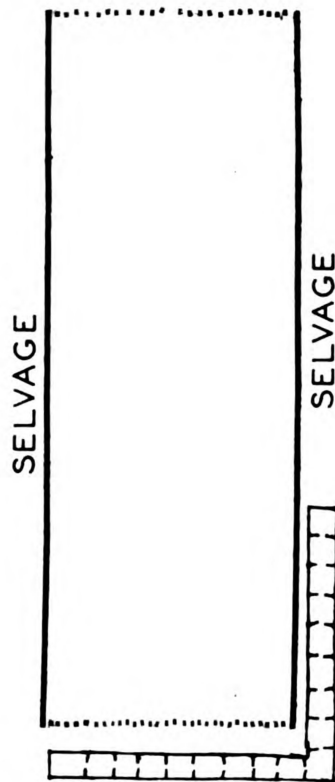
TEAR IF WEAVE IS NOT AFFECTED

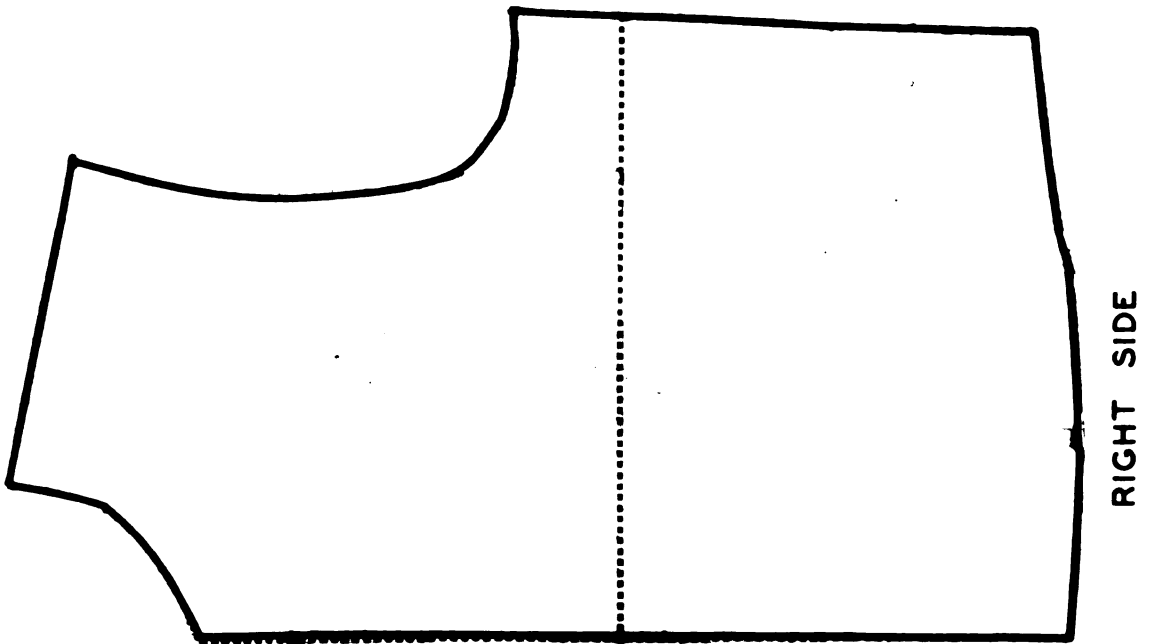
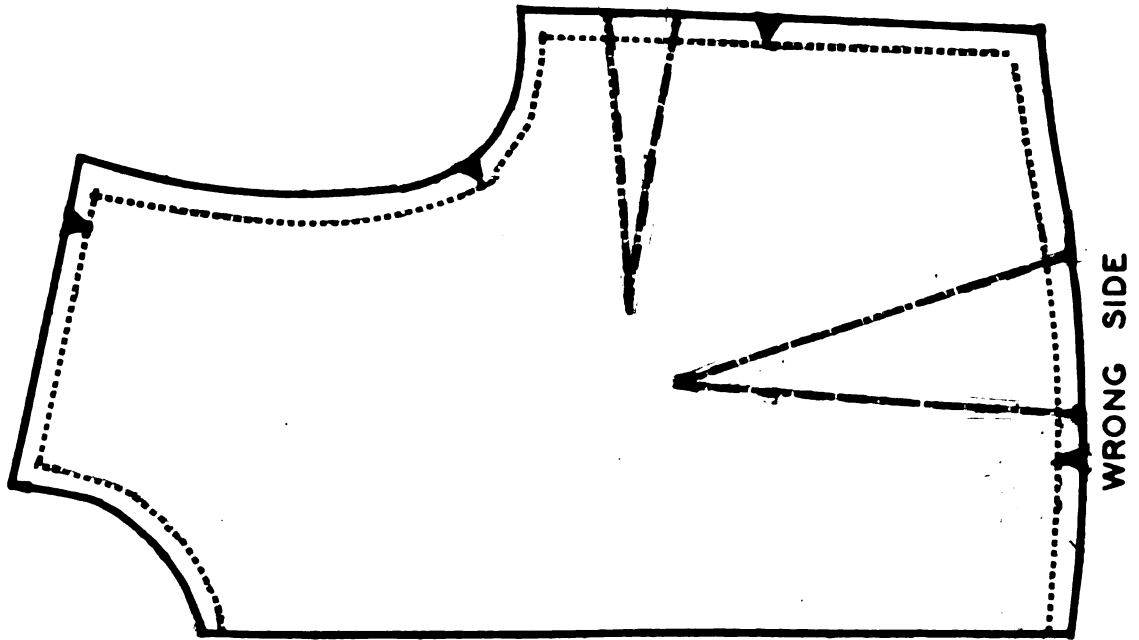


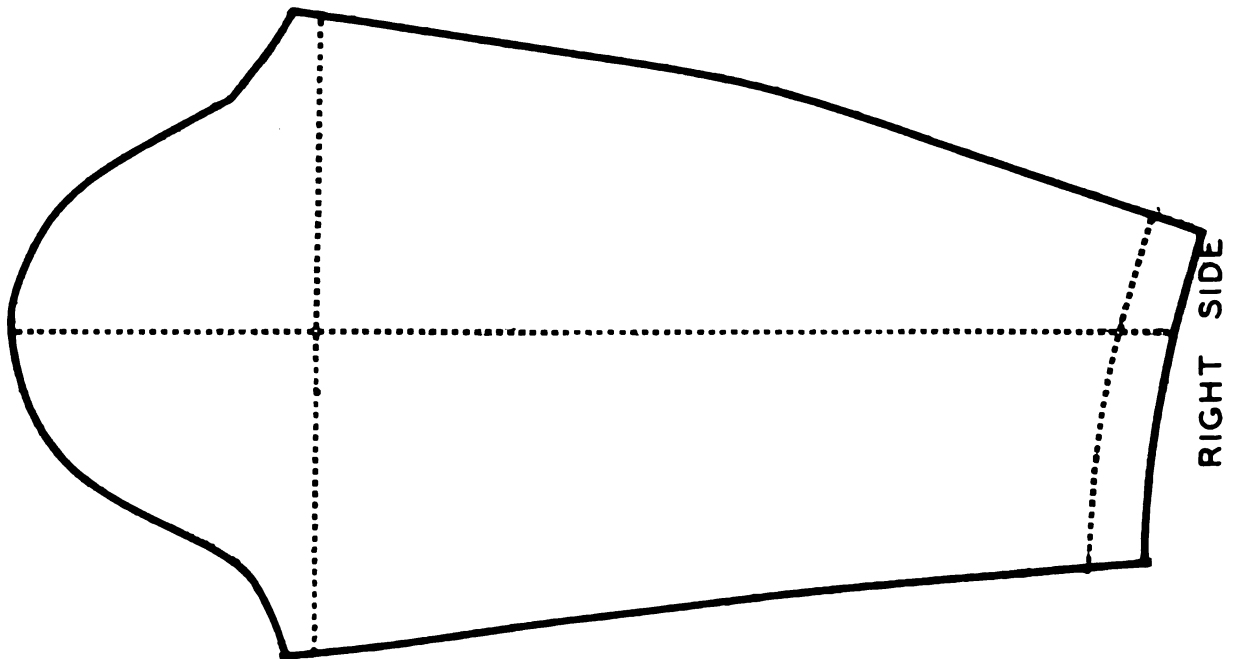
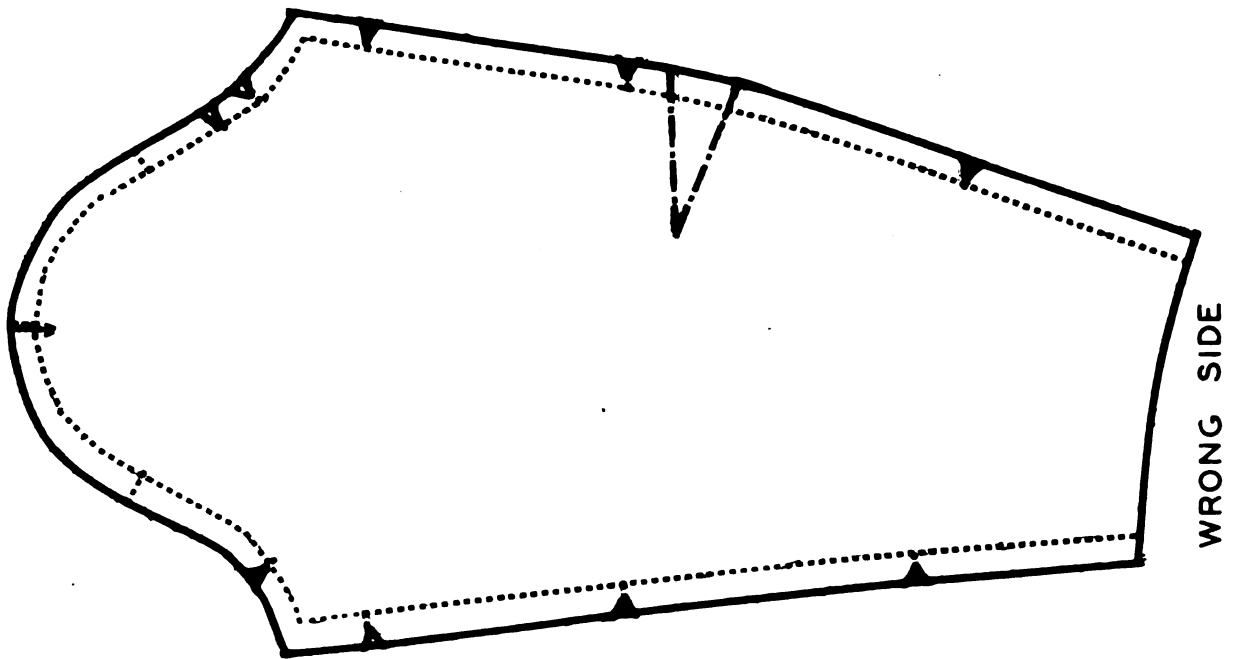
PULL A THREAD TO GUIDE  
CUTTING ON CROSSWISE THREAD

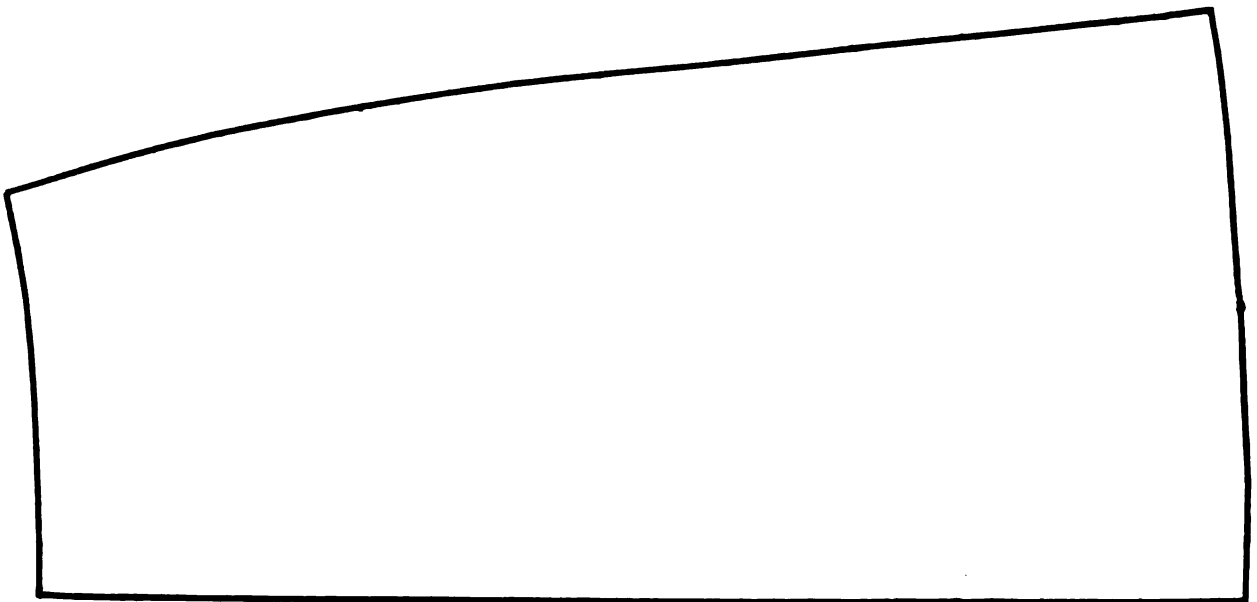
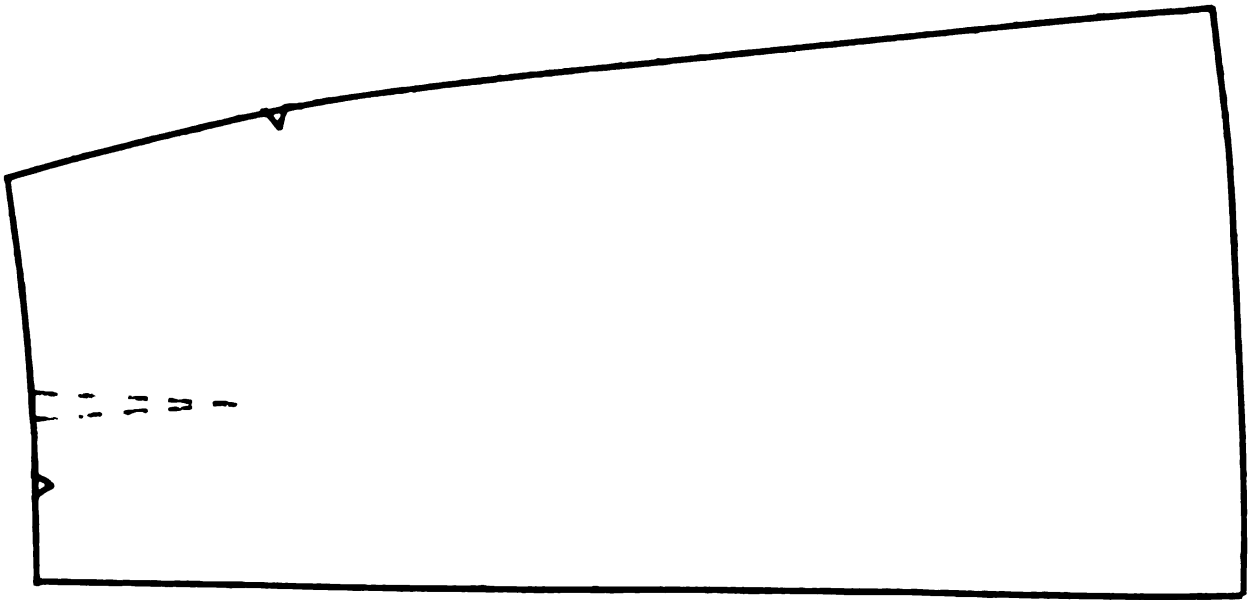


PULL SHORT ENDS TO FORM  
RIGHT ANGLES

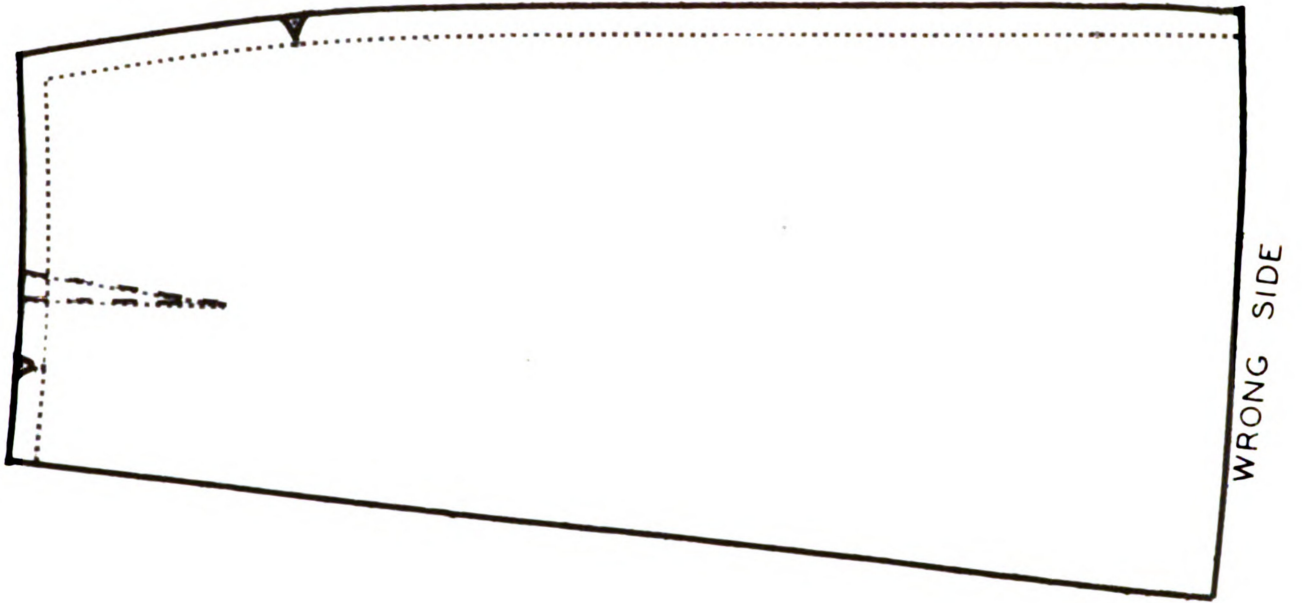
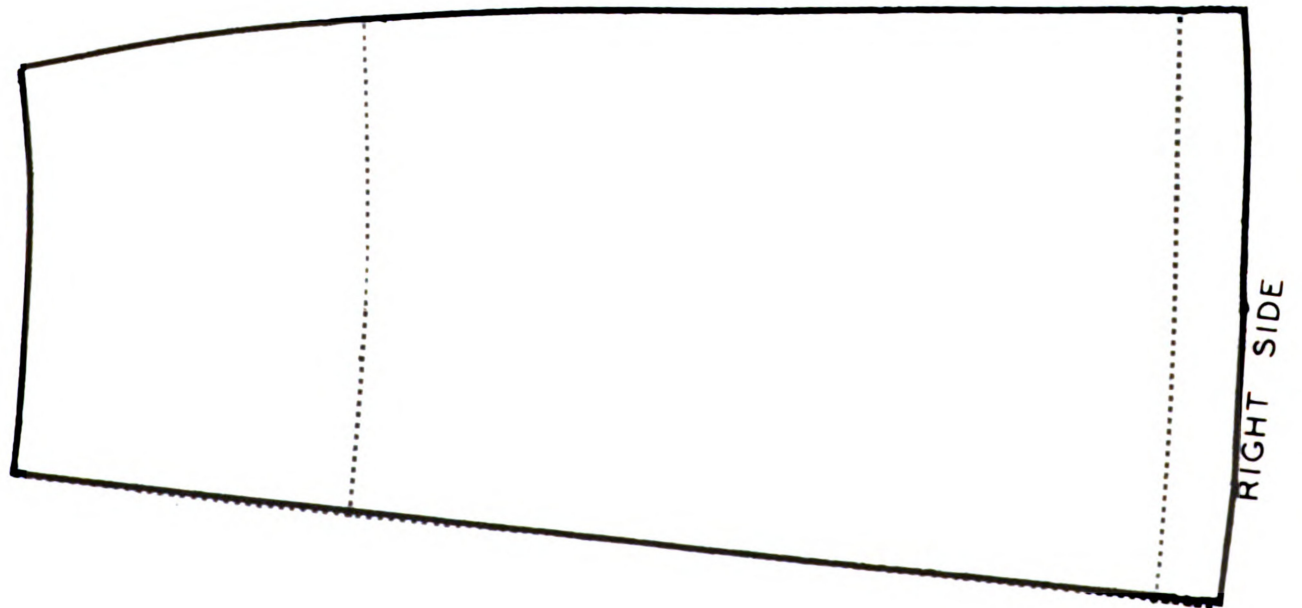


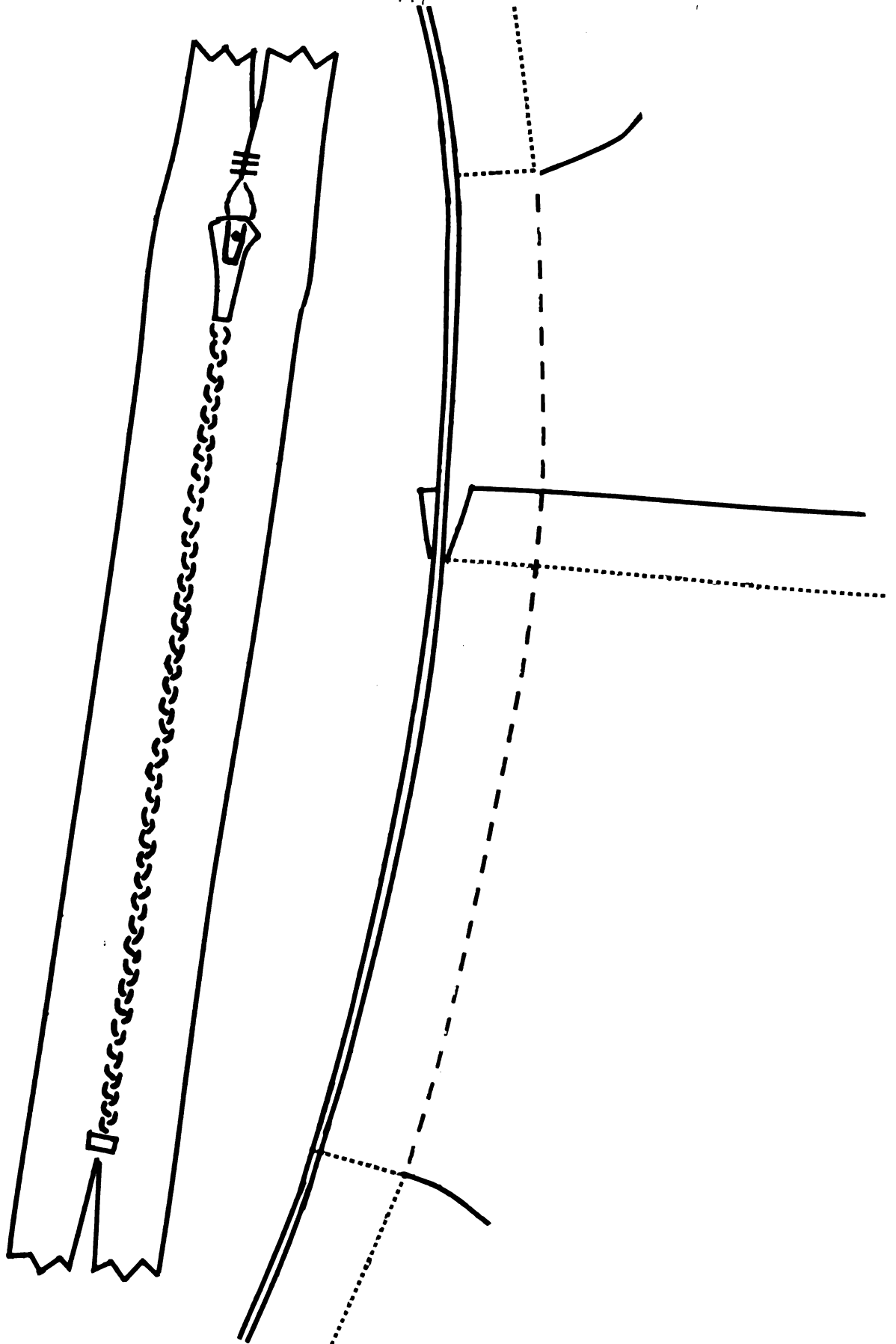




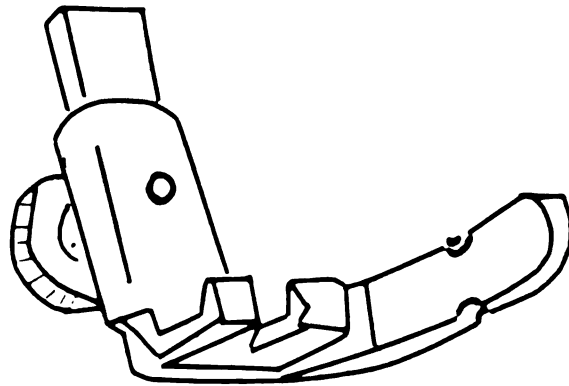




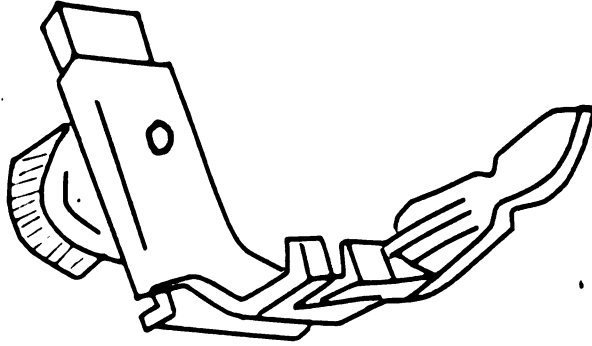




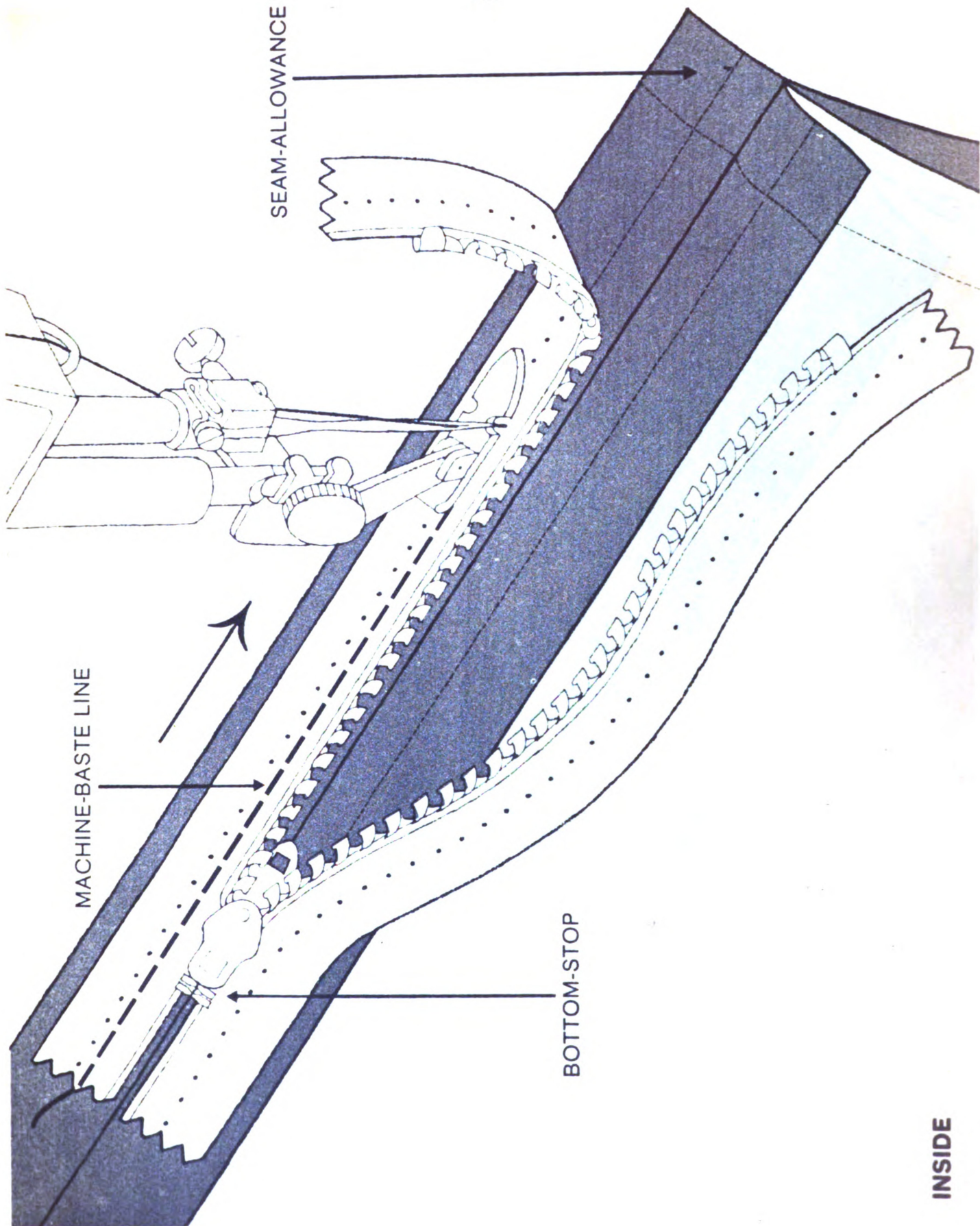
## CORDING FOOT

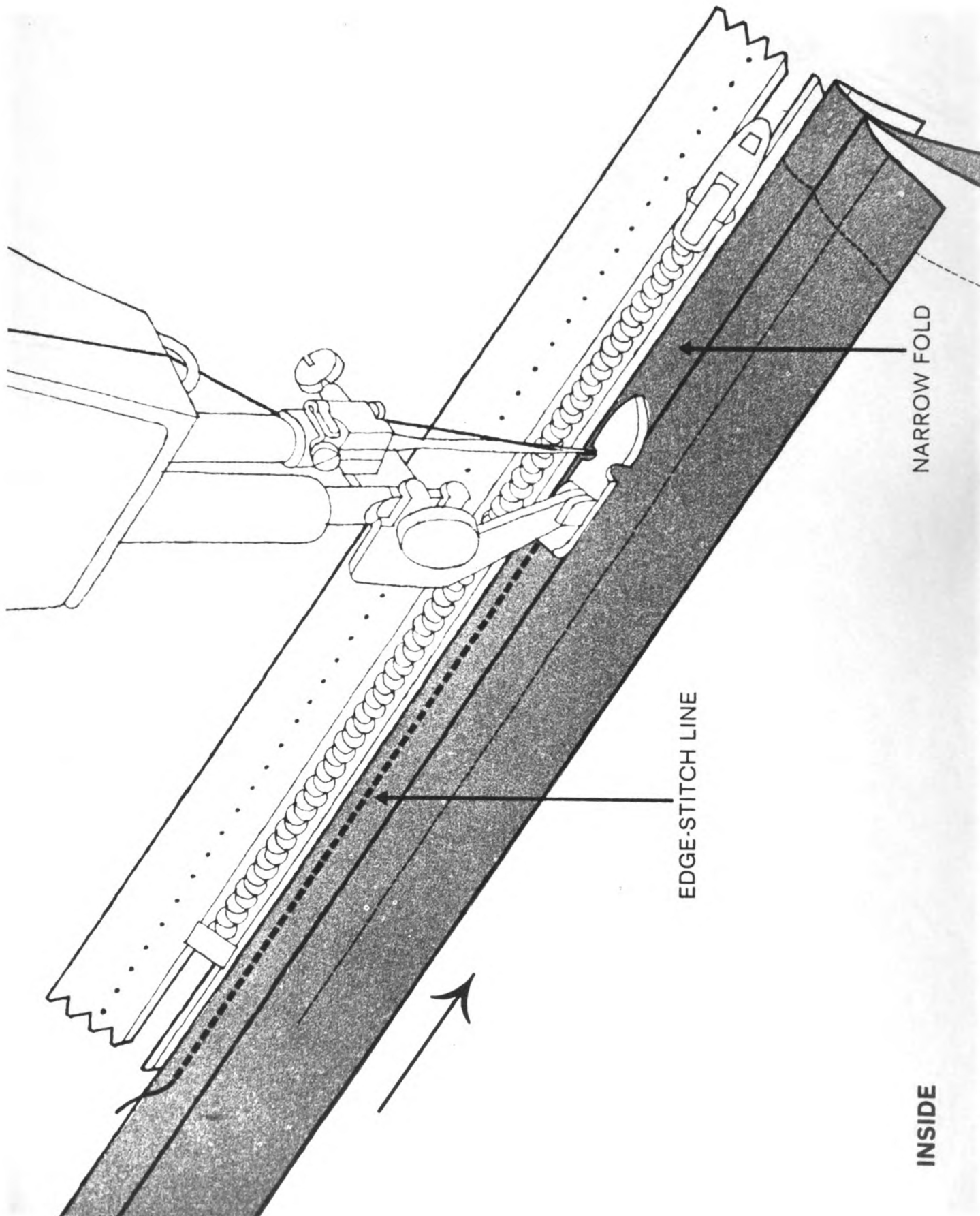


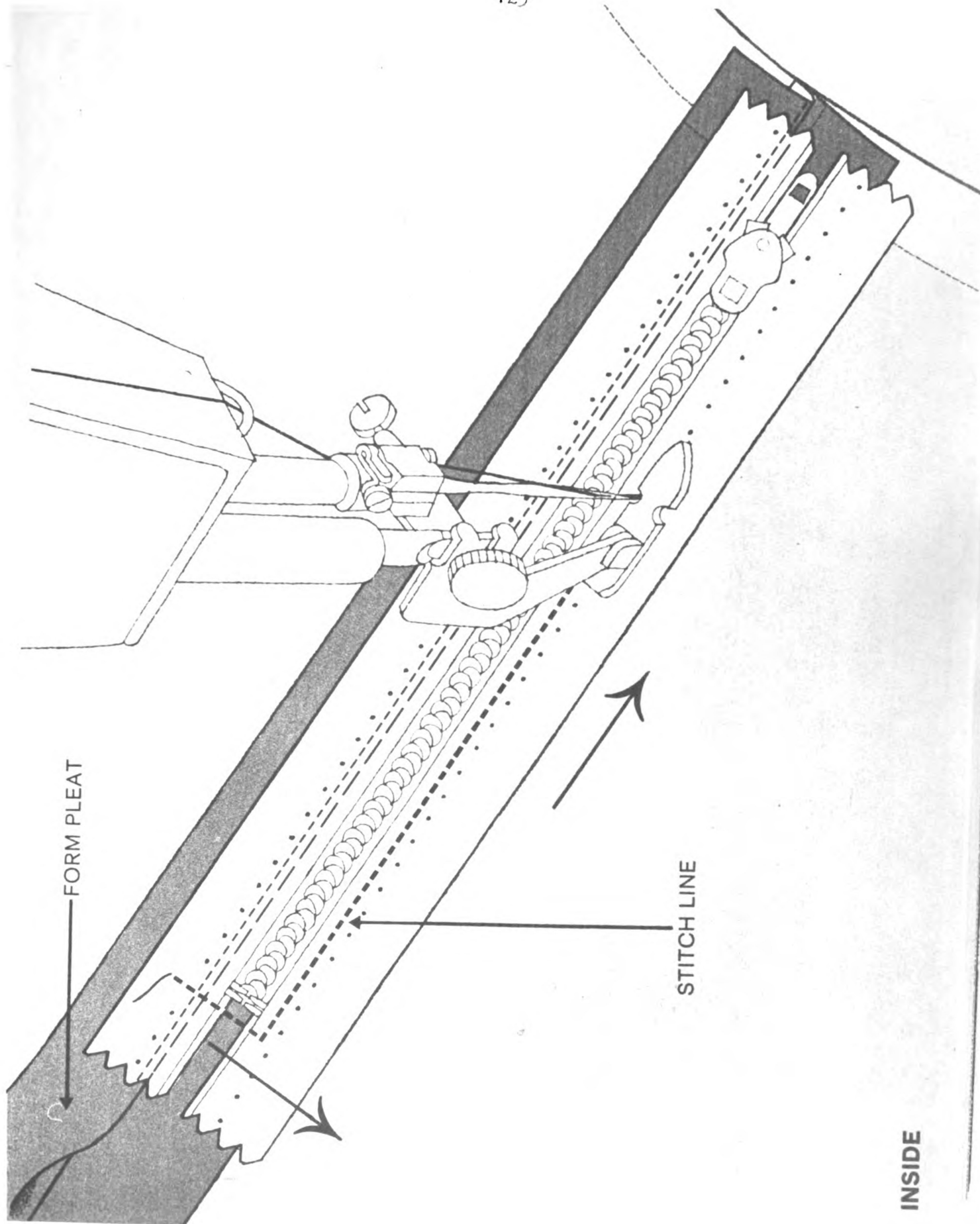
PLAIN



HINGED

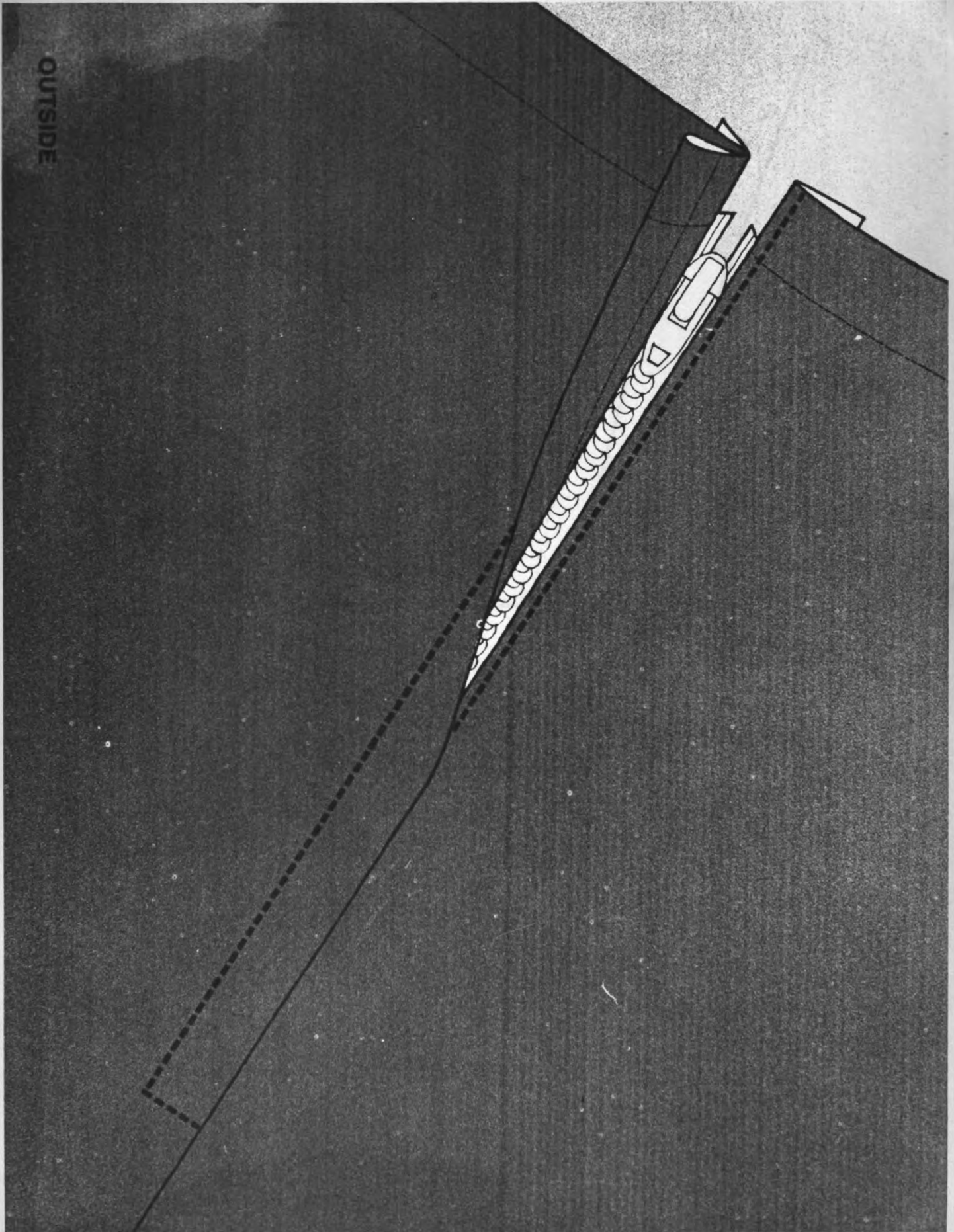


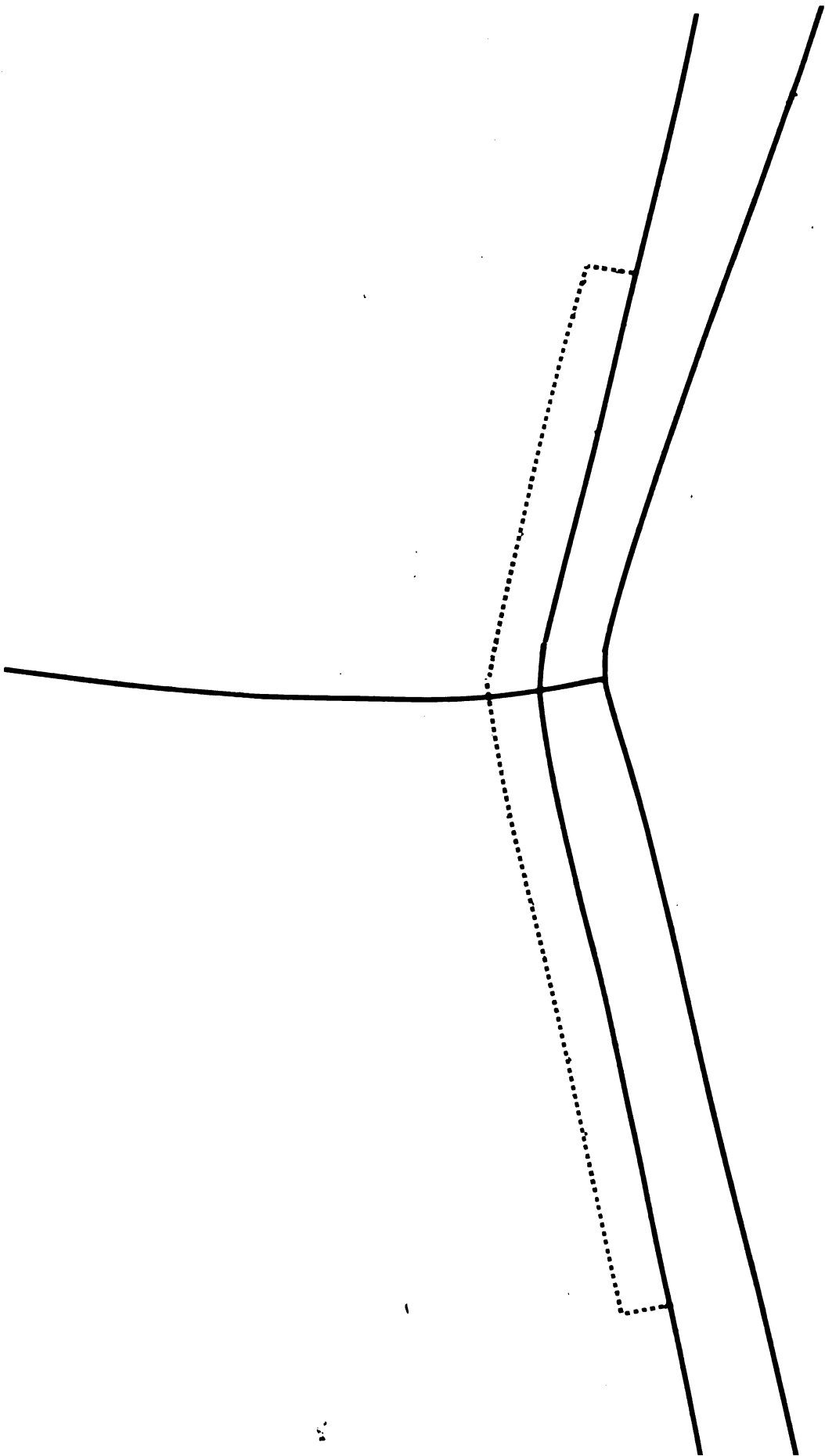






OUTSIDE

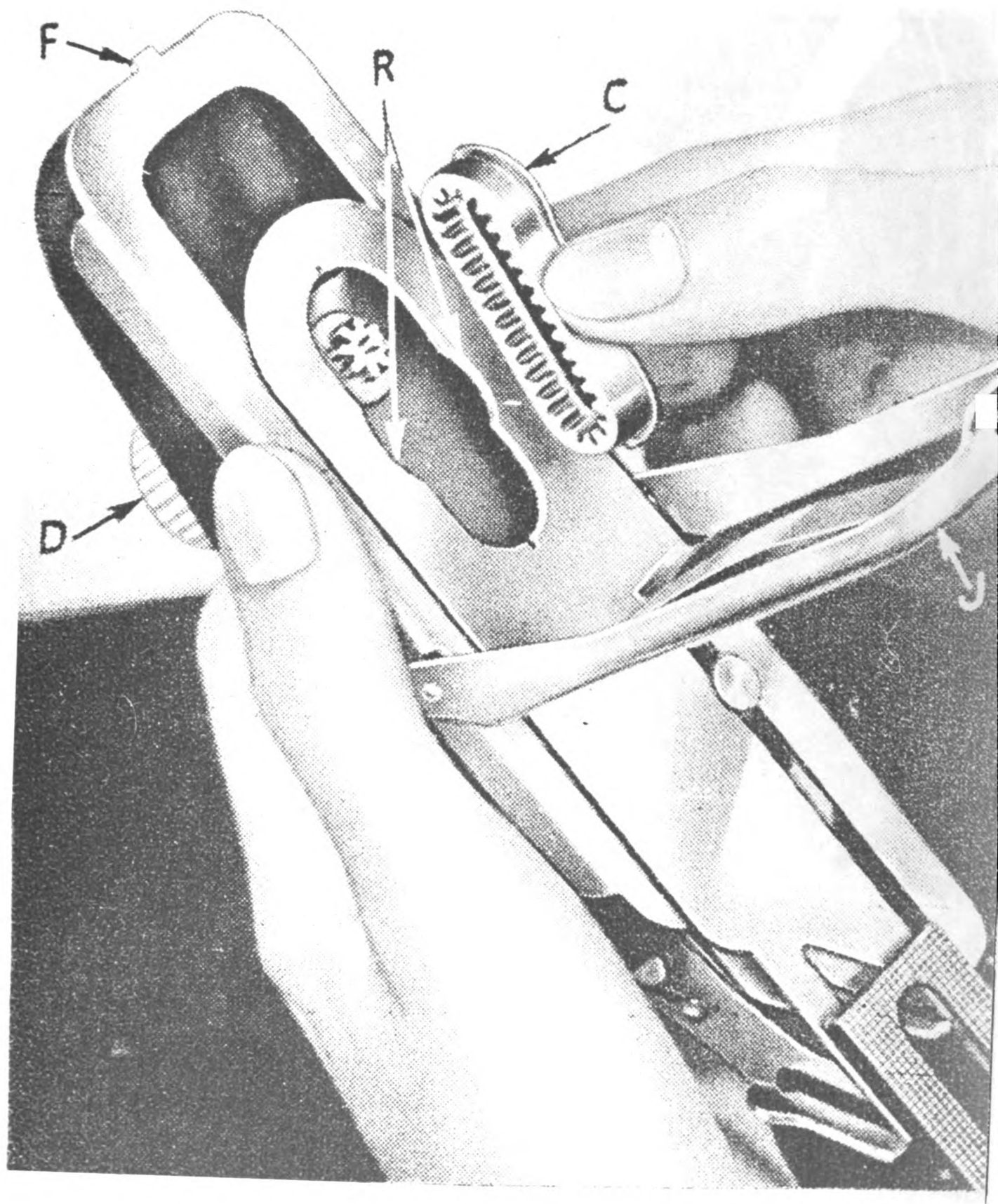




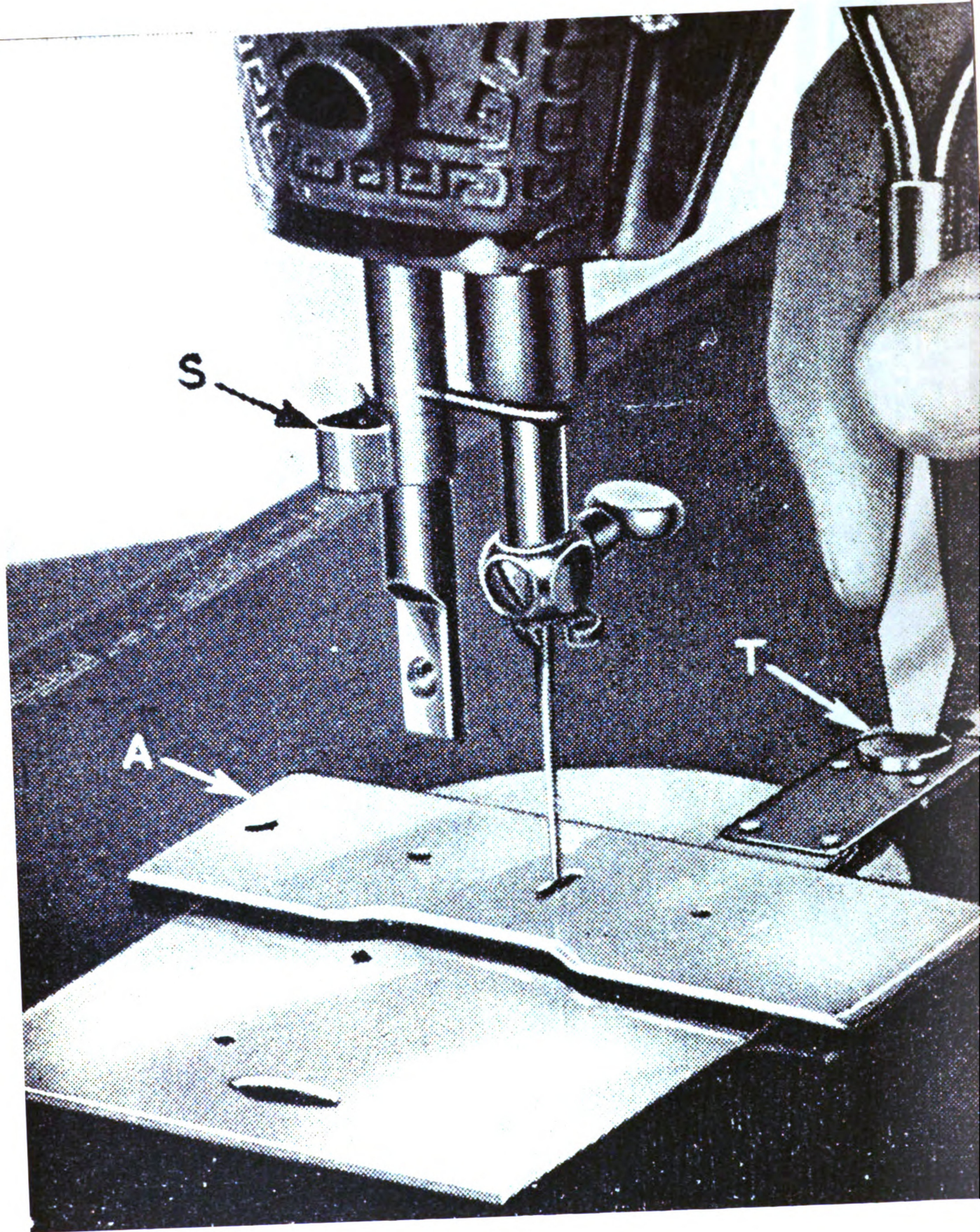






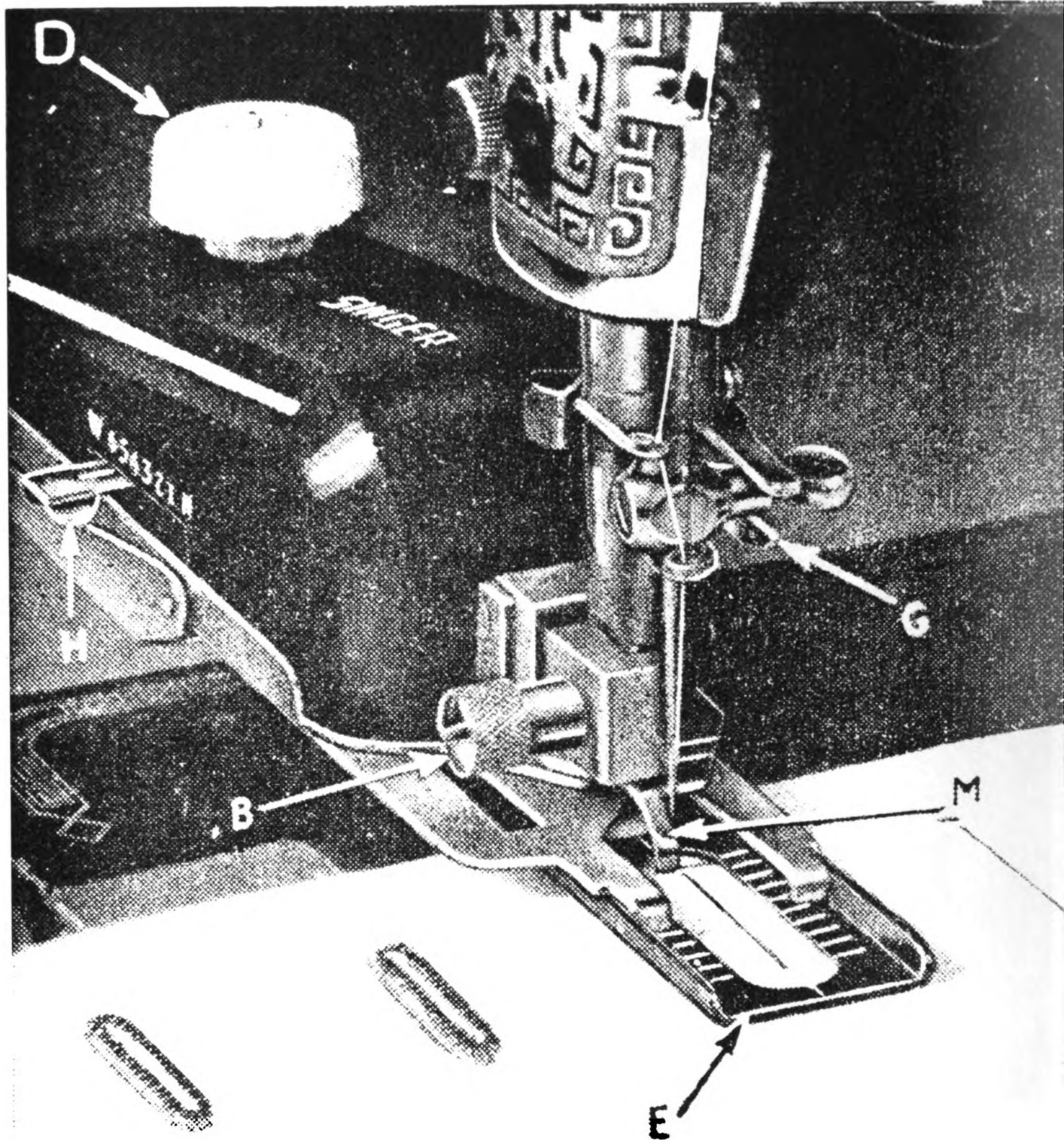




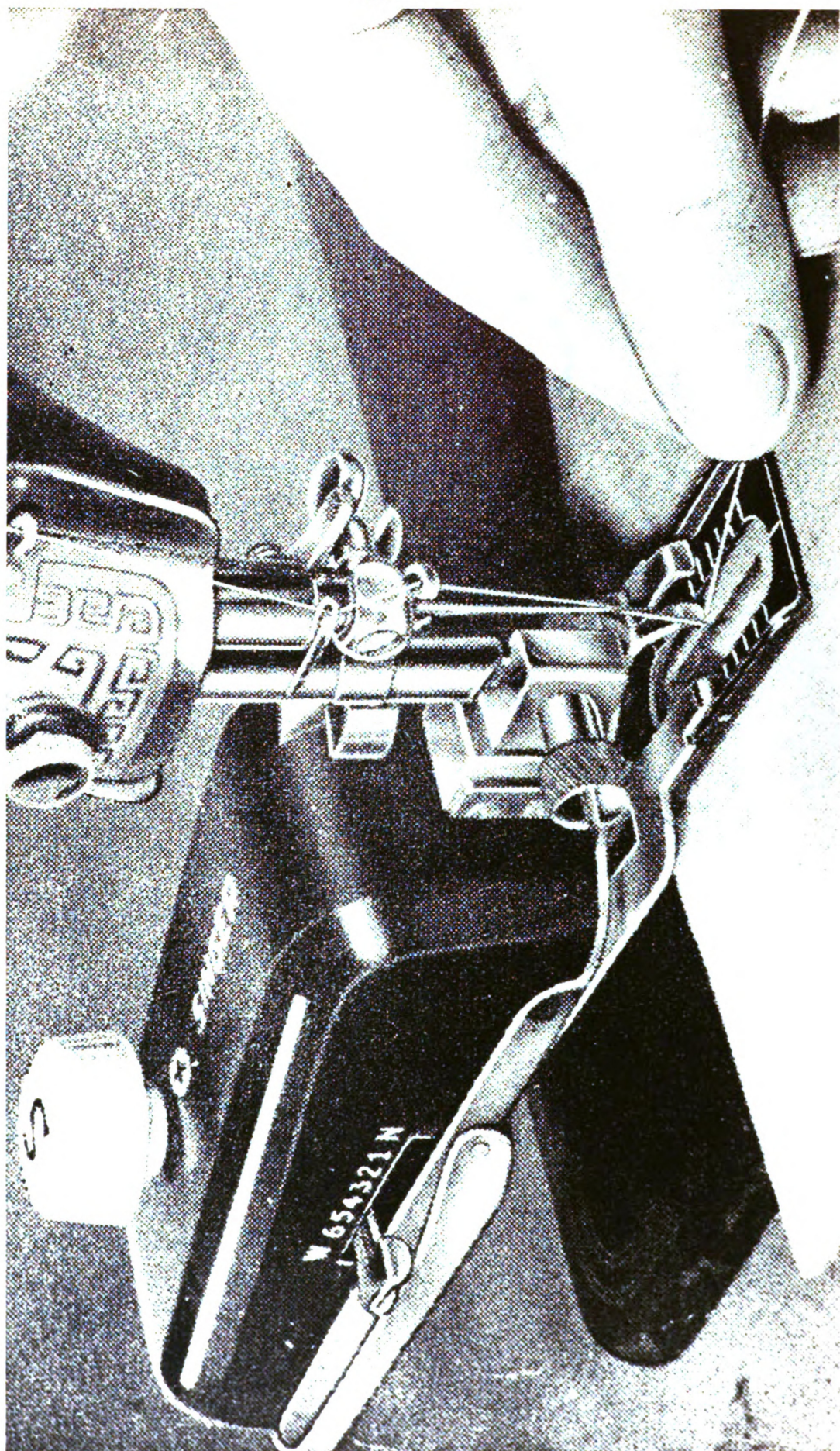










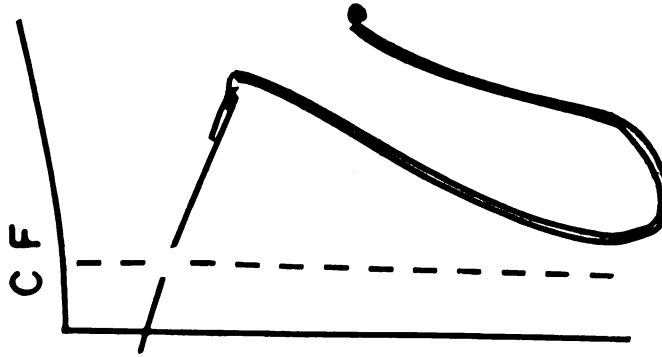


## SEWING ON A BUTTON

BUTTONS PLACED ON CENTER LINE OF LEFT FRONT.

PROCEDURE:

1. USE SUFFICIENT THREAD.

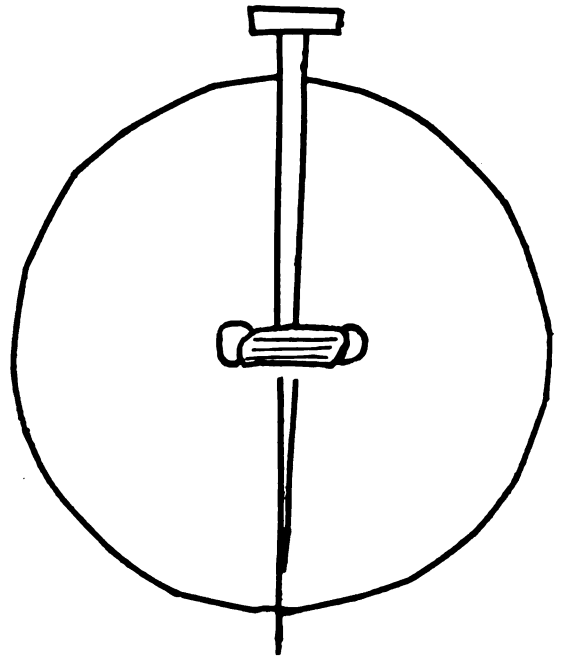
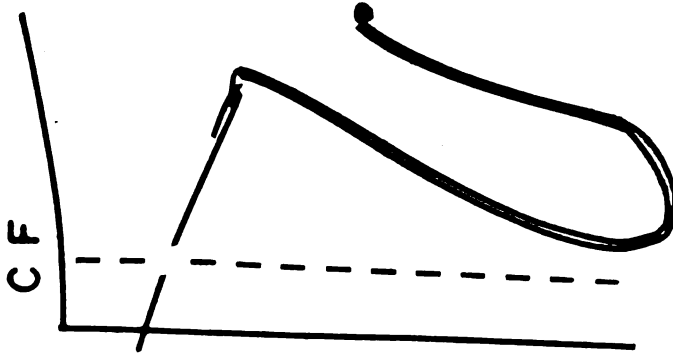




## SEWING ON A BUTTON

BUTTONS PLACED ON CENTER LINE OF LEFT FRONT.  
PROCEDURE:

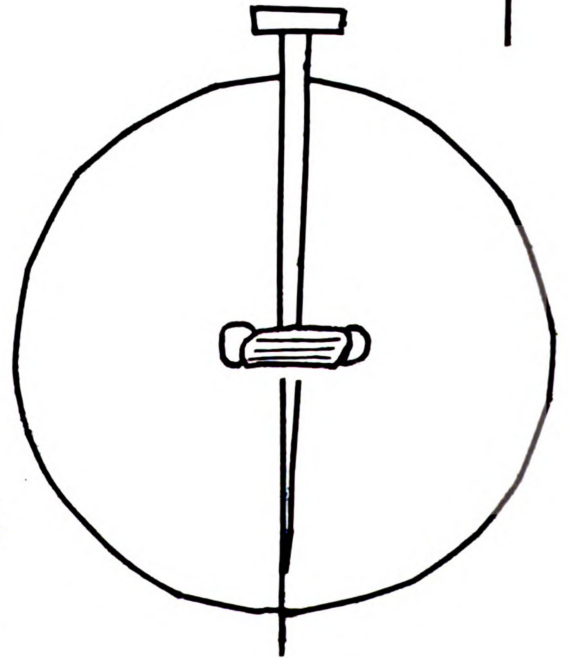
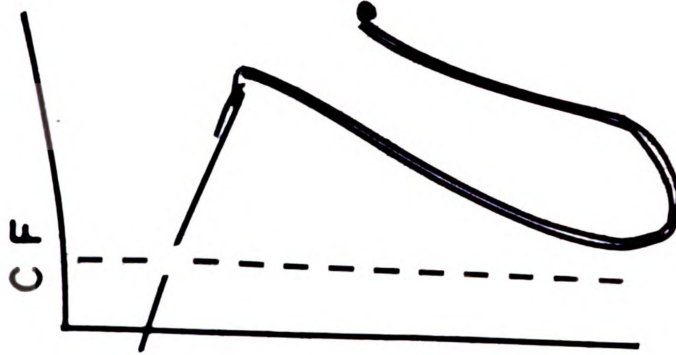
1. USE SUFFICIENT THREAD.
2. MAKE ONE STITCH THROUGH BUTTON.
3. SLIP PIN UNDER FIRST STITCH ON TOP OF BUTTON.
4. CONTINUE TO SEW UNTIL BUTTON IS FIRM.



## SEWING ON A BUTTON

BUTTONS PLACED ON CENTER LINE OF LEFT FRONT.  
PROCEDURE:

1. USE SUFFICIENT THREAD.
2. MAKE ONE STITCH THROUGH BUTTON.
3. SLIP PIN UNDER FIRST STITCH ON TOP OF BUTTON.
4. CONTINUE TO SEW UNTIL BUTTON IS FIRM.
5. REMOVE PIN; WIND THREAD AROUND OTHER THREADS UNDER BUTTON TO MAKE SHANK.
6. SECURE THREAD ON WRONG SIDE.



## **APPENDIX C**

### **Presentation Outlines**

## LAYOUT AND MARKING DEMONSTRATION

GOAL: To understand the process of fabric preparation, pattern layout, pinning pattern to fabric, extending of seams, and marking of garment pieces.

BASIC LEARNINGS	DEMONSTRATION	OVERHEAD
I. Equipment pattern guide sheet fabric measuring instrument pins scissors tracing paper tracing wheel	show actual equipment	discuss
II. Fabric preparation	discuss	discuss
A. Purpose <u>Muslin</u> not straightened because of sizing. Match selvages. Smooth with <u>dry</u> iron. Do not wash muslin.		
B. Explain selvage, crosswise grain, bias, true bias.	show on sample	fabric on screen
C. Correcting or straightening of grain	demonstrate on sample	overlays
1. crosswise grain		
a. tear		
b. pull thread		
2. lengthwise		
a. pull short ends		
b. square off		
Exception: some resin finished cottons cannot be straightened.		
III. Layout		
A. Guide sheet	discuss	discuss
1. size of pattern		
2. width of fabric		
3. style version		
4. type of fabric		
B. Pattern symbols	show on sample	overlays
C. Types of folds	demonstrate on sample	fabric on screen
D. Extend grain line	show on sample	demonstrate on screen
E. Establishing grain	demonstrate on sample	demonstrate on screen

BASIC LEARNINGS	DEMONSTRATION	OVERHEAD
F. Pinning--right angles to cutting line. Corners	demonstrate on sample	overlay
G. Extending seams shoulder, underarm, skirt side, sleeve underarm, waist, CB of skirt and bodice	show on sample	overlay
IV. Checking Layout	discuss	discuss
A. Are all necessary pieces included? (muslin--do not cut out a belt of facings)		
B. Are all fold lines placed along folds of fabric?		
C. Are all grain lines matched accurately?		
D. Are all seam allowances adequate?		
E. Are all pattern pieces perfectly flat?		
F. Could any fabric be saved by moving pieces?		
G. Have instructor or workroom instructor check layout.		
V. Cutting	discuss	discuss
A. Long strokes		
B. No notches		
VI. Marking		
A. Right side	demonstrate technique and discuss points to be marked	overlays and discuss
1. Bodice		
a. C.F.		
b. C.B.		
c. Grain line at bust level		
2. Skirt		
a. C.F.		
b. C.B.		
c. Grain line at hip level		
d. Fold line for hem		
3. Sleeve		
a. Sleeve lengthwise grain line		
b. Sleeve crosswise grain line		
c. Fold line for hem of sleeve		
B. Wrong side	demonstrate technique and discuss points to be marked	overlays
1. All seam lines		
2. All darts		
3. Crossmarkings--straight line through notch		
4. Sleeve cap seamline		
C. White or yellow carbon	discuss	discuss
1. Right side reinforced with pencil		
2. Use a ruler for straight lines		

## SET-IN SLEEVE PRESENTATION

GOAL: To understand the technique of setting in a sleeve.

BASIC LEARNING	DEMONSTRATION	OVERHEAD
I. Garment pieces needed	show the actual pieces	transparency
II. Markings on garment pieces that apply to setting-in sleeves	point out markings	overlay
III. Preparation of sleeve		
A. 2 rows of stitching; 1/16" from seam line and 1/4" from that within seam allowance	show on sample	overlay
B. Underarm seam sewn	show on sample	discuss
C. Trim shoulder seam to 5/8"	discuss	discuss
D. Staystitch armscye	show on sample	demonstrate on screen
IV. Matching Points	show on sample	transparency
A. Shoulder		
B. Underarm		
C. Crossmarkings		
V. Distribute ease and pin closely	show on sample	overlay
VI. Stitch on cotton dress Baste on muslin	show on sample	overlay
VII. Reinforce		
A. From one notch across bottom to other notch	show on sample	overlay
B. Do not reinforce muslin	discuss	discuss
VIII. Finishing		
A. Do not press from outside	discuss	discuss
IX. Standards		
A. Even distribution of ease	show on sample	transparency
B. Correct placement of grain		

## GARMENT CLOSURES DEMONSTRATION

- GOAL: 1. To understand the application of a slide fastener.  
 2. To understand the process of making a buttonhole.  
 3. To understand the techniques of sewing on a button.

BASIC LEARNING	DEMONSTRATION	OVERHEAD
I. Selection of slide fastener		
II. Slide fastener lapped application	discuss	transpar- encies
A. Determining length of placket		
Dress--length of fastener		
Neck-- $1/4$ - $3/8$ "		
Skirt--length of tab		
B. Procedure	demonstrate at the machine	transpar- encies
Baste placket closed and press open. Baste-stitch opened fastener to one seam allowance using cording foot. Close slide fastener, turn face up making narrow fold in seam allowance and edge-stitch on fold. Final stitching. Remove basting.		
III. Neckline finish	show samples	transpar- ency
IV. Standards	discuss	transpar- encies
A. Teeth concealed $1/8$ " beneath edge of overlap from the top to the bottom		
B. The pull tab is well covered.		
C. Stitching appears even		
D. When closed, placket fits smoothly, with no stretching or pulling on either side		
E. Thread ends for all seams that will not be crossed by other stitching are securely tied and snipped short enough so that they will not be caught in the teeth of the slide fastener.		
F. Total overlap width should not exceed $3/8$ ".		
V. Buttonholes		
A. Function of parts of button- holer	show parts on actual button- holer	transpar- ency discuss
Fork arm		

BASIC LEARNING	DEMONSTRATION	OVERHEAD
Adjusting knob		
Template retainer plate and lock		
Templates or cams		
Bight adjuster		
Cloth clamp		
B. Attaching buttonholer to machine	attach to machine	transparencies
C. Placement of buttonhole 1/8" from center front, closer to right front bodice edge	show premeasured sample	overlays
D. Process of making buttonhole	make on sample	overlays
E. Cutting buttonhole	demonstrate on sample	discuss
VI. Buttons		
A. Placement		
On center front (1/2 width + 1/4" -- 1/2" from edge)	show premeasured sample	overlays
B. Attaching button with shank	discuss	discuss
1. Sew shank securely to cloth		
C. Attaching button without a shank	demonstrate on sample	overlays
1. Start with sufficient thread.		
2. Secure thread by taking several small stitches. Make one stitch through the holes in the button.		
3. Slip pin or match under the first stitch on top or under the bottom.		
4. Continue to sew stitches.		
5. Remove match or pin and wind thread around the other threads.		
6. Secure thread on wrong side.		
VII. Interfacings	discuss	discuss



## **APPENDIX D**

### **Reactionnaires**

## QUESTIONNAIRE

NAME \_\_\_\_\_

Which of the following were new learning experiences for you in TCRA 152?

- \_\_\_\_\_ Pattern layout
- \_\_\_\_\_ Set-in sleeves
- \_\_\_\_\_ Application of a slide fastener (zipper)
- \_\_\_\_\_ Attachment of a buttonholer to the machine
- \_\_\_\_\_ Machine made buttonholes
- \_\_\_\_\_ Sewing on a button with a thread shank

Demonstrations concerning pattern layout, set-in sleeves and garment closures were presented to the class. What would you consider to be the advantages and disadvantages of this method?

Advantages

Disadvantages

If in the demonstrations an overhead projector had been used, what do you think your reaction would have been?

## QUESTIONNAIRE

NAME \_\_\_\_\_

Which of the following were new learning experiences for you in TCRA 152?

- \_\_\_\_\_ Pattern layout
- \_\_\_\_\_ Set-in sleeves
- \_\_\_\_\_ Application of a slide fastener (zipper)
- \_\_\_\_\_ Attachment of a buttonholer to the machine
- \_\_\_\_\_ Machine made buttonholes
- \_\_\_\_\_ Sewing on a button with a thread shank

The overhead projector has been used in presenting pattern layout, set-in sleeves, and garment closures to the class. What would you consider to be the advantages and disadvantages of this method?

Advantages

Disadvantages

What suggestions do you have for improving teaching with the overhead projector?

What was your reaction to the overhead projector?

Would you have preferred classroom demonstrations (similar to the demonstration on curves) in place of the overhead projector? Give reasons for your answer.

Yes \_\_\_\_\_ No \_\_\_\_\_ Uncertain \_\_\_\_\_

Reasons:

## **APPENDIX E**

### **Frequency Distribution Tables**

FREQUENCY DISTRIBUTION TABLE.--Number of students in control and experimental groups receiving score on 23 question pattern layout pre-test and post-test

Scores	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
1-4	1		3	
5			1	
6	2		1	
7	3		3	1
8	2		6	
9	3		1	
10	3		1	
11	1		4	
12	5		1	
13	1	1	3	
14	4		5	1
15	2	1	2	1
16	3	2		2
17	5	1	2	2
18	2	4	1	3
19	4	4		3
20		6	3	8
21		8		7
22		13	1	6
23		1		4
	<hr/>	<hr/>	<hr/>	<hr/>
	41	41	38	38

FREQUENCY DISTRIBUTION TABLE.--Number of students in control and experimental groups receiving score on 13 question set-in sleeves pre-test and post-test

Scores	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
0			1	
1				
2	4		5	2
3	9		7	
4	15	2	7	
5	7	3	8	1
6	5	5	7	4
7	3	6	4	11
8	1	11	4	10
9		10		6
10		4	1	7
11		3		3
12				1
13				
	<hr/>	<hr/>	<hr/>	<hr/>
	44	44	44	44

FREQUENCY DISTRIBUTION TABLE.--Number of students in control and experimental groups receiving score on 21 question garment closures pre-test and post-test

Score	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
1				
2	1		1	
3				
4	5		3	
5	1			
6			2	1
7	1		2	
8	2	1	5	1
9	2		5	1
10	9	1	2	2
11	2		3	3
12	3		3	4
13	2	1	3	6
14	5		5	1
15		5	2	2
16	2	6	1	6
17	1	4		6
18	3	5	2	3
19		10	1	2
20		7		2
21				2
	<hr/>	<hr/>	<hr/>	<hr/>
	39	40	41	42

FREQUENCY DISTRIBUTION TABLE.--Number of students in control and experimental groups receiving score on 57 question retention test

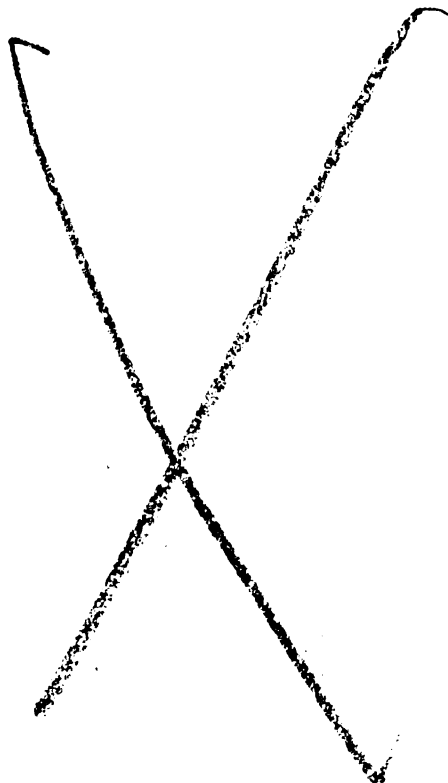
Score	Control Group	Experimental Group
1-28		
29		1
30-33		1
34-36		1
37	3	3
38	2	2
39	4	1
40		1
41	1	
42		1
43	1	5
44	3	7
45	3	2
46	2	2
47	3	4
48	5	2
49	5	2
50	3	1
51	1	
52	1	1
53		2
54	1	1
	<hr/> 38	<hr/> 40



ROOM USE ONLY

~~10/15/75~~ 1245

~~07/75~~ 047





MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 03175 3225