AN ANALYSIS OF SHOEMAKING PROCESSES

BY

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from the

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V

18 Gray Street
Cambridge, Massachusetts
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Professor A. L. Merrill
Secretary of the Faculty
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Cambridge, Massachusetts

Dear Sir:

In accordance with the requirements for graduation I herewith submit a thesis entitled, "AN ANALYSIS OF SHOEMAKING PROCESSES".

Respectfully submitted,

E. M. Rickard, Jr.

E. M. Rickard, Jr.

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STATEMENT OF THE PROBLEM

ISSUES, SCOPE AND OBJECTIVE

This investigation is an analysis of the twenty odd shoe manufacturing methods commonly employed in the United States today. Its purpose is to study the several modes of construction, or processes, and to determine those that are most suited for the various types of shoes.

Practically every type of shoe is made today by each of the processes, even though it is evident that this is not possible if the most profitable product is sought. There could not be twenty ways of making a shoe, all of them equally good.

To solve the problem, it is first of all necessary to classify the "types" of shoes that are being demanded by the consumers. Price ranges offer one means towards this end. If shoes are classified as to prices, there is a good start in deciding which processes are the most suitable ones, for the cost items of manufacturing must be varied in the twenty different cases. The uses to which a shoe is put offers another aid in our solution, for each distinct use must obviously call for certain features characterised by only some of the processes.

In order to be in a position to place the processes in the two classifications, costs must be known, and the characteristics, or structural advantages and

disadvantages, of the various methods of manufacture must be found. Where it is possible to eliminate a process, this is desirable. Such a chance could arise in the case of two similar processes, each offering the same characteristics, and one being superior to the other.

Thus it is seen that there are four issues to deal with before the desired results can be obtained:- price ranges, uses, structural features, costs.

This investigation is to cover the shoe trade in the United States. The field work, factory visits and store interviews, is confined to Massachusetts and New York but inasmuch as this area is typical of the entire industry, results can be drawn that will give a true cross section picture of the country. Almost all of the processes are found in this section, which is still most important in the industry.

The subject is limited to women's footwear, because men's shoes are almost entirely made by the same process, the Welt, or some variation of it.

This investigation has as its objective, the attempt to decide which process should be employed for making each use of shoe in each price range.

SUMMARY OF INVESTIGATION

In studying the various processeses, it was found that certain ones could be eliminated from consideration since they were similar to, and inferior to, others. This was a great help in searching for exact figures on costs inasmuch as these were very difficult to obtain.

The price ranges and uses of shoes were very easily determined. The shoe trade in general was found to be in agreement on these two issues, particularly on the uses of shoes.

Costs was an issue that was hard to deal with, but very definite and concrete when once lined up. The factories were too busy to give the detailed figures of their costs,--even if they had been more willing to spend the necessary time on this, it would have shown little unless the shoes made in each place were all of the same quality, material and labor. However, the figures of associations of manufacturers could be obtained with some accuracy.

The structural advantages and disadvantages of the processes could only be revealed by thorough study. No manufacturer was in a position to give the true characteristics of the process he was using. This was due partly to prejudice, and partly to the fact that he did not take into account the human element of his controlling, guiding

ownership. Concerning the latter reason, it is obvious that a certain manufacturer can easily overcome an obstacle in his method of manufacturing, that another could not, whether it be on account of the quality of the help, the quality of the material, or the mere fact he is in charge of the factory.[1]

To learn the true characteristics, it was necessary to have the opinion of an expert on shoe processes, a person very seldom found in this industry.[2] Therefore, it was necessary to study each case thoroughly enough to recognize all advantages that existed, considering solely the structural elements. Time factors and ease of operation were classed as a part of the cost of the shoe.

The manipulation of the data and facts consisted of classifying and then placing the proper functions in the classifications. Then classifications were united, and thereby certain functions were eliminated or still further classified. One set of figures, or one selection of facts, led to another logically, until the final object was arrived at.[3]

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1. See preface.
2. Of the men interested in this work, most are working to promote a certain method for making shoes. Others are men who have to take the human element into consideration.
3. The first section of the appendix has all of the charts, plates, and figures that led to the results, assembled in the order that they were evinced from other data. It is very easy to follow the reasoning merely by regarding these pages in sequence.

CONCLUSIONS

This investigation found the following points to be true. They are the conclusions that were arrived at after analyzing all of the issues of the problem, and the basis for making the recommendations, which is the final objective.

1. There are five distinctly different uses of shoes, active sport, spectator sport, street, formal afternoon, and evening, shoes.

   A. In the higher price ranges, the consumer demands every feature that is desirable in a shoe.

   B. In the medium price ranges, the consumer demands all desirable features, but in a lesser degree of perfection than in case A.

   C. In the low price ranges, the consumer demands all of the outward features, those that show to the eye, while he is not so particular about those that do not pertain to appearance.

2. There are three price ranges, high, above $8.00; medium, between $4.40 and $6.60; and low, under $4.00.

3. There are six processes that should be considered for making shoes, of the twenty-one studied.

4. There are certain processes that are suited for the different uses.

   A. Active sports should be made by the Welt or Littleway Lockstitch process.

B. Spectator sports should be made by the Turn or Littleway Lockstitch method.

C. Street shoes should be made by the Welt, Turn, or Littleway Lockstitch method.

D. Formal afternoon shoes should be made by the Turn or Colton process.

E. Evening shoes should be made by either the Turn, Colton, or Uco process.

5. There are certain processes that can best be made in each of the three price ranges.

A. In the high price range, Welts and Turns should be made.

B. In the medium price range, Welts, Coltons, Littleway Lockstitches and Uco Lockstitches, should be made.

C. In the low price range, Littleway Lockstitches, Uco Lockstitches, and Uco Cements should be made.

RECOMMENDATIONS

The conclusions reached above, lead logically to the recommendations as shown here. Attention is once more called to the first section of the appendix where it is shown graphically how these recommendations are reached.

Shoes retailing above $8.00

Active sports	Welts
Spectator sports	Turns
Tailored town	Turns(or Welts)
Formal afternoon	Turns
Evening	Turns

Shoes retailing between $4.40 and $6.60

Active sports	Welts
Spectator sports	Little Lockstitch
Tailored town	Little Lockstitch (or Welts)
Formal afternoon	Colton
Evening	Colton

Shoes retailing under $4.00

Active sports	Littleway Lockstitch
Spectator sports	Littleway Lockstitch
Tailored town	Littleway Lockstitch
Formal afternoon	Uco cement
Evening	Uco cement

DISCUSSION OF INVESTIGATION

HISTORICAL ASPECTS OF THE SUBJECT

The history of shoes as concerns this investigation is composed of a gradual growth in both the number of methods for making shoes, and in the different uses to which shoes are placed. A hundred years ago, there were only two processes for constructing shoes; and there was for most consumers only one use for shoes, that of everyday wear.

GROWTH IN THE NUMBER OF PROCESSES

When man first began to roam the earth's surface he found it necessary to protect his feet. The simplest foot protector was the sandal, which consisted of a sole attached to the foot, usually by means of leather thongs. This use can be traced back to the earliest of times, and the sandal of plaited grass, palm fronds, leather or other material still continues to be the most common foot covering among certain primitive races. Where, however, climate demanded greater foot protection, the primitive peoples shaped a rude shoe out of an untanned piece of leather, lacing it with a thong, and thus forming a complete covering. Out of these two elements, sole without upper, and upper without sole, arose the perfected shoe, a combination of the two. Today, as always, the difference in the various methods of making shoes lies mostly in the manner used in joining these two parts.

Of the popular modern types of construction, Welts, Turns, and McKays for the past half century have been the most prominent. Turns have been found in Egyptian and Roman ruins; Welts are known to have been familiar to the sixteenth century shoemaking Guilds; McKays were developed in the United States about the time of the Civil War. The first two kinds, Welts and Turns, have long been, and still are, the "standards" to which other methods are often compared.

The first popular change from these three old methods came with the introduction of the Littleway system in 1924. This process is however, really an improvement on the already existing McKay system.

Since 1929 various methods of attaching the soles of the shoe by cement rather than by sewing, became popular in this country, although the idea of such construction has been for years practiced in Europe.

The ingenuity of the American manufacturer has resulted in a great many variations in stitching or in cementing in any of the above mentioned processes. It also has led to a combination of two or more processes, in an attempt to utilize for each step in manufacturing shoes, that particular method that is best. In many cases, the absolute minimum cost without regard to quality has been the governing factor rather than a reasonable balance between the two which would result in the substantial

product ordinarily typifying American industrial activity.

Thus there are present today a great number of processes, called by a separate name in each case even tho there is slight difference in the actual manufacturing steps, and even tho all grew out of only a few fundamental methods of manufacturing. There are at least twenty commonly found processes; and a great many more that are used in only a few places.

GROWTH IN THE VARIOUS USES OF SHOES

There can be no denying the fact that the growth in the uses of shoes was caused to some extent by the manufacturers and retailers in their attempt to create a larger consumer demand for their products. There was, however, a natural growth on the part of the consumer to demand more shoes, and to demand a wider range for uses of shoes.

Shoes have only followed the trend of all women's apparel in this matter. In late years, particularly since the World War, fashion has decreed that mi-lady must have a shoe for each dress, just as she must have a hat for each dress.

This naturally led to all of the various uses of shoes that we find today, such as one shoe for morning wear, one for sport wear, one for dancing, one for walking, etc.

PRESENT DAY CONDITIONS

As a result of the growth in the number of methods for manufacturing shoes and in the different uses to which shoes are put, there are two bad situations existing in the shoe trade:

1. Each process is being made to supply all of the various uses.

2. Processes that are undisputably best for certain uses in high price ranges, are being made in all price ranges, for the same uses.

As to the first, it is only natural to expect a manufacturer to at least attempt to sell his process in every kind of shoe. From his point of view, he has the machinery on hand and can lose nothing by entering every possible market.[1]

As to the second, again it is only natural. Consumers will always be found who buy a much inferior product merely because it is a copy in make of a very superior and expensive product.

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1. A good example of the conditions of today is the case of the Turn shoe. It is made for every use to which a shoe is put; it is made in all price ranges. And this despite the fact that it is a shoe that lends itself definitely to high cost, low volume manufacture, and to those uses that require only a light weight, dainty shoe.

METHOD OF ATTACK AND PROCEDURE

The investigation logically fell into three parts:(1) to investigate the retail prices of shoes to determine what they were;(2) to investigate the uses of shoes in order to find out some general classification and to find out what characteristics were desirable for each use;(3) and finally to investigate the actual processes from all angles in order to determine which ones should be employed for the various uses in all of the price ranges.

PRICE RANGES

The first step in analyzing this part of the subject was to interview the retail stores. Price alone was sought for, as the sole object was to find out how large a range retail prices covered. Individual, chain, and department stores were visited in Boston and New York and questioned concerning prices.

Next, retailers and manufacturers [1] were interviewed in order to find out what the different price ranges were within the larger scale that covered all shoes. Here success was not good enough to warrant any faith in the interviews. Each man had his own opinions concerning the price ranges, but they did not all agree absolutely.

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1. See Appendix R

Two members of the Boston Shoe Style Show Committee[1] were next interviewed about their opinions on price ranges. As the two views were not similar in all degrees, this method of attack was dropped as unreliable also.

It was finally decided to rely on the reports of the National Shoe Retailer's Association for a definite price range that would be the one most generally used in the United States. This decision was made after considering the annual surveys and reports that are made by the Association in which an attempt is made to cover a true cross-section of the country. So the classification as to price was taken from their reports.[2]

As a final checkup on the classification chosen, the one given by the members of the Shoe Style Show was consulted to see if there was a reasonable agreement.

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1. See Appendix R.

2. See Appendix A-1

USES OF SHOES

Here it was possible to eliminate the mistake made in the search for price ranges, by going first to the National Shoe Retailer's Association's annual report. The 1933 meeting's reports were used to find a classification of uses.[1]

The first method of checking this classification was to compare it to that used by the Boston Shoe Style Show Committee. This checked perfectly.

To further check the classification, tho it was not absolutely needed at this point, a few retailers and manufacturers were interviewed.[2] Once again the results were practically the same.

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1. See Appendix E-1

2. See Appendix R

PROCESSES

There were two main angles of the processes themselves that were of vital importance in this investigation. The structural characteristics and their comparative advantages and disadvantages had to be determined in order to find out which processes were best suited for every use of a shoe; the cost advantages had to be found in order to know which processes should be made for each price range.

STRUCTURAL ADVANTAGES

The first step in finding out the characteristics of the different processes was naturally to decide on a list of factories for study and analysis. The list that was decided on was chosen with the help of a manufacturer who was able to arrange the plant visits in such an order that each new process was the logical one to study after those that had gone before.[1] For example, it was so planned that the Littleway McKay was studied after the plain McKay, the only main difference between the two being that stables are used in place of thread in one step. A factory was selected for all of the different processes, wherever possible to find one in the surroundings of Boston. In all of the important cases this was possible.

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1. See Appendix R

Before the actual study of the different methods of manufacture could be commenced, it was found advisable to spend two days in a factory in order to learn the steps in production, to become acquainted with factory parlance, to learn the names of the parts of a shoe, and to learn the names and sequence of the various operations. For this work, a Welt factory was chosen which also made a few Turns, so that the two "standards" of shoemaking could be carefully studied. It was necessary to have a guide, acquainted with the factory in all details, to help in these first two days.[1] Each factory decided on, was visited and the process used there was studied.

It was originally planned to interview a responsible man in each of the factories visited, in an attempt to gain his opinions on the desirable and undesirable features of the process used. This was abandoned in order to pick a few persons, of wide experience, for interviewing.[2]

The collection of data consisted of writing in detail the steps that were used, and the intended advantage of each new one found. Particular attention was paid to the structural advantages and disadvantages, and to time factors and ease of performing the steps, as they would affect large or small scale manufacturing.

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1. See Appendix R

2. See Appendix R and Precission discussion.

COSTS

1. For the costs of the different processes, the Haverhill Shoe Manufacturers Association and the Lynn Shoe Manufacturers Association were consulted. Inasmuch as the labor in these two cities is paid according to an agreement reached between the Associations and the Unions, the data collected from these sources was very reliable as to the labor cost. The Associations were also able to give costs of materials, and were in the best situation to give figures covering all of the factories in the area. In gathering this data, it was essential to have figures for each process on a shoe, real or imaginary, that in each instance was made in the same style and in the same quality.

2. It was also thought advisable to collect figures for any one process that would show how costs vary for the same process as the material was varied in any style of shoe. For this work, it was necessary to have access to the books of the company, so the Colton process was chosen as the most accessable. The figures were averaged over a year's time, and were reliable since they were records of real cases, as opposed to the figures under 1. which were bound to be imaginary.[1]

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1. See precision discussion.

3. For a further investigation of the same process, it was decided to find figures showing how cost would vary in a shoe made by the same process, with the same material, as the pattern was varied, the Colton was again chosen for the same reasons as above.

4. Some means had to be found for comparing costs of the different processes, including all items such as those influenced by time factors, skill of labor, ease of operations, etc.

PRECISION DISCUSSION

The precision of the data collected for each of the four main issues, prices, processes, uses, and costs, is different in each case. The underlying reason is, that the data was collected from different sources, actual figures being used in some cases, opinions in other cases, and findings of other persons in still other cases.

1. PRICE RANGES The final ranges used in this investigation were taken from reports of the National Shoe Retailers Association, so we must merely know that they are in a position to give the best classification obtainable. For years this organization has attempted to aid the retailers in a number of ways, the most important being (1) to forcast future style trends as they pertain to patterns, colors, and materials, and (2) to advise retailers on the managing policies most suited to this country.

It is the second point that is of interest here, (the first point bearing on the "Uses", below). Naturally, in any work of this nature, statistics are of prime importance, for it is only in terms of past experience that any advise can be given as to the best future aims, past experience that is based on actual, concrete figures. In their annual survey of the retail trade, it is essential that they classify the stores in some manner in order to

interpret the results into their desire. For a number of years they have used the classification taken for this investigation as theirs.

No other investigator could possibly have more interest in correct classification than this same N S R A (National Shoe Retailers Association). It is working solely to further its own interests. Furthermore, it is undoubtedly the one most thoroughly dealing with retail shoe figures.

The purpose of a price classification in this investigation is to have some means of selecting the processes best suited for the different levels of price, so all that is needed is a classification that is one generally used, one that would hold the same for all of the retail stores. That used by the N S R A is certainly the one most suited for this purpose, and surely accurate enough.

2. USES The classification of uses of shoes was again taken from the N S R A, inasmuch as they use it in forcasting future trends and in analyzing past performances. This is a grouping that is almost universally accepted in this country.

The fact that the Boston Shoe Style Show uses the same one, is an excellent check, since this organization represents the combined efforts of all of the larger New England shoe interests.

When dealing with the characteristics of each use of shoe, there is less actual definiteness. What is it that makes a shoe a "walking shoe", and what are the features inherent to it? An answer to the question would be as good a way as any to find the features that are looked for in a walking shoe by the consumer. The member of the Shoe Style Show who checked this classification was interviewed about this question, and more of its same nature, and his opinion checked by retailers in general. The final characteristics were in reality a matter of fact. From the consumer all the way to the manufacturer there is the same idea as to what features are desirable in a certain shoe. The walking shoe must have comfort and durability for example, and those two features are expected from all who deal with the shoe; they are, to be sure, definite facts. The discussion under "processes" concerning the precision of such reasoning, will make this clear.

3. PROCESSES The advantages and disadvantages of a certain process, the characteristics of that process, are essentially a matter of fact. It doesn't need any persons' ideas or any experts' opinion to decide that tacks under the foot are uncomfortable to the wearer. Nor is it anything but fact that thread in a union of two parts of a shoe is more flexible than tacks. These are matters of fact and as such can be found by a careful study of the shoe in question.

In order to make certain that no characteristics were omitted in the analysis, certain persons were chosen to interview, whose past experience, and present position in the shoe industry made them the logical ones to consult.[1] It was thought best to omit the average manufacture in searching for advantages and disadvantages of that type shoe that he made, for the reason that he is always apt to stress the advantages of his method.[2]

4. COSTS The costs dealing with the same process as the style and material were varied, was accurate in the minutest detail, since the figures were taken from the books of a company that had made those shoes for the preceding year.

The figures dealing with the costs of the different processes for the same shoe, same style and material, were naturally figures that were not absolutely accurate, inasmuch as they were not taken from past performances of factories. Since the cost of labor was definitely known and the cost of material known accurately, these figures are certainly within the accuracy of this investigation.

The overhead costs, those that would aid in determining whether the process was suited for large or

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1. See Appendix R

2. See Appendix F

small scale manufacture, were determined from the observations in collecting data. Observations as to whether the process was one requiring long time of production, and whether the ease of the operations called for skill or not. Inasmuch as there is no need to draw any fine distinctions among the processes in this point, the method used was accurate enough for the investigation.

ANALYSIS OF DATA

ANALYSIS OF CASE MATERIAL AND DATA

It is well to have in mind what must be found in the case material and data. There are certain facts that must be had concerning each of the four main issues of this investigation, facts that must be drawn from the data either directly or indirectly.[1]

There must be found the classification of price ranges that exists in this country.

The various uses to which a shoe is put must be determined and also the characteristics that make each use in a definite class.

As to processes, first of all, there must be a narrowing down of the number considered in the beginning in order to be in a better position for manipulating figures and facts. Then the structural advantages and disadvantages of each process retained for consideration must be found.

Costs for the processes selected must be determined in order to know the relative costs of each.

The following pages deal with the data in drawing out all that has been set out as necessary.

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1. This is in line with the Method of Attack.

RETAIL PRICE CLASSIFICATION

It is recognized quite generally in the shoe industry, that there are definite price ranges for retailers, price ranges that the manufacturers strive to meet and that the retailers try to maintain. However, each group of manufacturers and retailers has its own conception of this classification. For example, Haverhill shoe makers all hold to the classification that is used by the Manufacturers Association for that city, and Lynn shoe makers hold to their own classification; the two ranges are more or less similar, but not absolutely so. On the other hand, each city has a fairly definite range for prices in its retail stores. The question is further complicated at present by the continual change in all prices.

Plate A-I shows a classification[1] that is divided into three main groups, large volume prices, medium volume prices, and low volume prices. These three groups would meet most of the opinions as to retail price classification, being in fact, that used by the National Shoe Retailers Association.

In order to further classify prices, it was necessary to divide each main group into two subdivisions. The actual prices that were chosen were ones that would cover the most number of cases possible. As has been pointed out, the purpose here is to have some method of placing

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1. See Appendix A-1, and also Precision Discussion.

the various processes in their proper price levels--therefore, the one chosen, is detailed enough.

RETAIL MARKUPS

Retail markups, for the purpose of this thesis, are of no importance, for retailers cannot alter the amount that a shoe is sold for. In most cases the manufacturer of a certain class of shoe, sells his product at a certain price, and to be retailed at a certain price.[1] This is clearly explainable, when it is considered that a manufacturer must protect himself by having all his shoes offerred to the ultimate consumers at the same price, he cannot allow certain localities to pay more or less than other localities. On the other hand, he cannot allow favoritism to exist in changing his prices to retailers, so he sells all of his product at the same price. Consequently, a retailer that desires a greater markup for his product must by force, buy shoes from a manufacturer who allows a larger difference between wholesale and retail prices to exist.

RELATION OF MANUFACTURER'S PRICES TO RETAILERS

For the purposes of this thesis there is little of interest to be found in the relation of manufacturer's

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1. See Appendix C-2 for example.

USES

The classification of uses is shown on plate E-1 and the main features that are desirable for each case shown in the same place.[1] There are certain facts that are true concerning these uses and characteristics.[2]

1. Each use given in the classification is in a class all by itself. It has characteristics that belong solely to it.

2. The uses are recognized by the majority of the shoe men as being the only manner of distinguishing the different kinds of shoes.

3. Every desirable feature is a record of facts.[3]

4. The consumer in buying shoes has certain desires that must be fulfilled, but which are not the same for each use in a different price range.[4]

In the high price ranges the consumer naturally demands, and should receive, every characteristic that is in a shoe, such as comfort, fit, wear, etc.[5] As the price of the shoe is lowered, the consumer automatically drops the number of demands. His order of dropping them

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1. See Appendix E-1. Also see discussion as to precision of this classification.
2. See Appendix E-1
3. See Precision Discussion.
4. These facts are a composite view of the average retailer of Boston and New York. See Precision Discussion for logic in accepting these views.
5. See Appendix E-1 for full list.

will depend on how low the price is. In the medium price ranges, he is more apt to require all of the characteristics of the expensive shoe, only in moderation. That is, he wants all desirable features, but does not persist in having the last degree of perfection in each one. In the lower prices, on the other hand, the consumer is more apt to drop some of the requirements, particularly wear, and ability to hold shape.

To be more specific on this point, it is necessary to consider each use of shoe. In formal shoes of any description, daintiness, and style, are important. And as the lower prices are reached, the other features are disregarded. An inexpensive dancing shoe, for example, need have very little durability, but must appear as good as an expensive Turn.

In the shoes that receive a rougher use, it is more usual to find the consumer demanding every desirable feature of an expensive shoe, only in a lesser degree.

PROCESSES

In the data on processes there were twenty-one cases presented. Of this number all but six can be counted as methods of construction that should have no serious consideration.[1] The reasons for dismissing those that were dropped all come under one of the following heads.

1. An old process was replaced by a new and better one.

2. A new process was dismissed because it did not offer the advantages it was professed to.

3. A new process was dismissed because it offerred nothing but novelty to shoemaking.

At this point a brief resume of the processes themselves will be given to point out clearly why those dropped were so treated.

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1. See Appendix F.

RESUME OF STRUCTURAL ADVANTAGES AND DISADVANTAGES [1]

WELTS

Advantages...Flat surface offered to foot...Great amount of flexibility...Any sole thickness...Any leather thickness...Easily repaired...Sturdy construction.

Disadvantages...Cost comparatively high due to extra steps and merchandise...Good material should be used...

Remarks...For a heavy duty shoe, or for one that needs sturdy construction, the welt shoe is one of the best. This shoe should be bottomed by a lockstitch and generally is.

TURNS

Advantages...Light weight...Very good fit...Holds shape... Very flexible.

Disadvantages...High cost due to hand labor...Good materials needed throughout...Long time needed for shoe to dry.

Remarks...For a light weight, dainty shoe, if cost is disregarded, this shoe is unsurpassable.

MCKAYS TACK LASTED

Advantages... Time needed is small...Inexpensive.

Disadvantages...The shoe loses shape when pulled... Uncomfortable to wearer...Unflexible, and even rigid... Difficult to repair.

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1. See Appendix for detailed description.

Remarks...The only two advantages of this shoe are of no significance today due to the use of cement in lasting which has all the time and cost advantages of the tacks, and is not injurious to the wearer's foot, so consequently this particular type of shoe should not be considered at any price range.

SILHOUWELT

Advantages...The same as for a welt made by the Good Year process, plus the fact that time and labor are saved in the bottoming process...Tin welt can be used.

Disadvantages...The cement used in bottoming has not enough of a surface to properly hold.

Remarks...The welt shoe made by the Goodyear process is in popular use because it has such a rugged character. It is rediculous to make a welt shoe by the silhouwelt process inasmuch as there is so little gained in time and cost, and so much lost in durability. No cement shoe can stand the same wear and tear as a sewed shoe, and since it is only in the final step of the making process that there is a difference in the two methods, this shoe can be dismissed as undesirable for any purpose.

LITTLEWAY LASTED MCKAY

Advantages...Same as for McKay tack lasted, plus the fact that there are no tacks under the surface of the foot.

Disadvantages...Same as for the tack lasted McKay.

Remarks...This shoe is good for a very cheap shoe, one that

is made at such a cheap price that it pays to use the chain stitch instead of the lockstitch (see Goodyear Lockstitch, under Appendix F). In present times, however, there is no need to use the former method in preference to the latter, so this shoe can be dismissed even for the most inexpensive shoe.

MCKAY WELTS

Remarks...There is no reason for making shoes with this method, inasmuch as it is foolish to copy a welt shoe if tacks have to be used in lasting, all of the advantages of the welt are thus lost. If a cheaper shoe than the welt, made properly, is desired, a cheap method of construction should be used.

MOCK WELTS

Remarks...To make a cheap shoe with a welt, solely because it will look expensive, is something that should not be considered in making shoes. Far better would it be to use the extra cost of the welting for a better shoe.

STITCHDOWN

Advantages...Flat surface offered to foot...Great amount of flexibility...Any sole thickness...Any leather thickness...Easily repaired...Sturdy construction.

Disadvantages...Fairly good material should be used... Staples used in lasting may rust when wet.

Remarks...This shoe offers most of the advantages of the Goodyear welt, and can be made considerably cheaper since

the stapling is easier to perform than the sewing and since it is easier to add the welt, done at the same time the sole is bottomed. As was pointed out under that section dealing with Stitchdowns, if thread is used instead of staples, the result would be a shoe that would be as good as the Goodyear welt in every detail for heavy duty shoes. For trim footwear, as is desired in the main for all women's shoes, however, this shoe cannot stand comparison to the plain welt, since there is not the extra firmness and support due to the welt itself. In the stitchdown, the welt is used mostly to cover up the joint between the upper and the sole, while in the Welt, the welt is used to support the outersole. Consequently, a dainty shoe would not appear so compact when made with the Stitchdown method. So for women's shoes, this type of shoe can not replace the Goodyear welt, and since it is designed merely to replace this particular shoe, it need not be considered further.

LITTLEWAY LOCKSTITCH

Advantages...All of those offered in a McKay type of shoe that is speed, cheapness, ease in making, plus the fact that there is only the one thread of the Lockstitch under the foot, the stapling process being used in lasting.

Disadvantages...Shoe apt to lose shape when pulled...Not very flexible...Difficult to repair.

Remarks...This shoe is by far the best of the McKay type

of shoes. Most of the inexpensiveness of the ordinary McKay is retained while there is a maximum of comfort and flexibility due to the staples and the Lockstitch. For those who dislike the use of cement in shoes, this type of shoe should have serious consideration for low priced shoes. It can be made in many desired weights.

UCO LASTED LOCKSTITCH

Remarks...This shoe has all of the advantages of the Littleway Lockstitch, and naturally all of the disadvantages. The question of whether it is actually better depends on whether cement is better than staples. Consequently, this shoe should also have serious consideration for all low priced footwear.

SKELETON UCO LOCKSTITCH

Remarks...As was pointed out under the section dealing with this shoe, the only feature offered of advantage is the solid sole under the middle of the foot. Again, however, it is stressed that there are more bad features offered than good ones, due to this sole. Furthermore, since the cost is higher, it seems out of the question to consider this shoe, or the Sbicca, which is practically the same. Of course, the process is so new, and thus in the experimental field still, that there is always room and time for it to develop into a good one, but at the present, it is of no value in replacing any of the other processes.

CEMENTS

TACKLASTED MCKAY

Remarks...This shoe has no advantages to offer, and is dismissed from consideration for the same reasons that the Tack Lasted McKay with sewed outersole, was discarded.

TACK LASTED WELT

Remarks...For the same reason as the one just above, this shoe is not to be considered.

COMPO LASTED

Remarks...This shoe is identical to the Uco cement, below, except that there is an extra step in lasting where tacks are driven temporarily. Since it has this extra step, and has not such a wide circulation of machinery for the steps in the production as has the Uco, this shoe will be dismissed as inferior to its mate the Uco cement.

LITTLEWAY LASTED CEMENT

Remarks...This shoe is lasted with staples, which give a very permanent union, and bottomed with cement, which does not give a very lasting joint. It is foolish to have the inner joints more firmly attached than the outer ones, for the shoe is worn when any of its parts separate. Therefor, it is wrong to put staples in the shoe, since they are more uncomfortable than cemont. For this reason, this shoe is dismissed. Any shoe that is going to rely on cement for the most difficult joint, the outersole, ought to use it throughout.

COLTON

Advantages...Light weight...Time in production is small... Arch, or instep, is well lasted and remains firm...Holds shape due to upper being sewed...Flexible due to only two layers of cement...Stands out well in box.

Disadvantages...Cannot stand water.

Remarks...This shoe is an excellent one of cement shoes. As the best one of its kind, it must have serious consideration.

UCO CEMENT

Remarks...This shoe is made entirely by cement, and as it it necessary to consider some cement shoe, this should be the one.

Advantages...Short time of construction...Inexpensive... Ease of operations.

Disadvantages...Unions not permanent...Does not retain shape... Cannot stand water.

SKELETON UCO

Remarks...This shoe is dismissed since it offers nothing of worth and costs more than a plain uco.[1]

SBICCA

Remarks...This is dismissed for the same reason as the Skeleton Uco.

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1. For a detailed argument, see Appendix F.

From the preceding resume, it is evident that the following list of processes are the ones that should be considered in making shoes.

1. Welts
2. Turns
3. Littleway Lockstitch
4. Uco Lockstitch
5. Colton
6. Uco Cement

There are five main divisions to the twenty-one methods of constructing shoes. These five divisions are, Turn, Welt, McKay, Cement and Lockstitch, shoes. Inasmuch as the Lockstitch was invented to replace the undesirable feature of having tacks under the foot, and does so at no extra expense, the McKay shoe can naturally be dismissed from consideration in selecting those processes that are worthy of attention.

The Turn shoe was selected. The Goodyear Welt was also selected. (These two are the only ones that are in their respective divisions.)

From the Lockstitch division, there was selected the Littleway Lockstitch, which was the best shoe made with staples and thread, and the Uco lockstitch, which was the best shoe using cement and thread.

From the Cement group, the Colton was chosen because it combined the cement and staples in the best manner; and the Uco cement was taken because it was the best example of a shoe made entirely by cement.

Thus there is one shoe-making process left for each different type of process.

STRUCTURAL ADVANTAGES AND DISADVANTAGES OF SELECTED PROCESSES

The six processes selected for consideration have the essential features that are listed below.[1] In giving the main points, the Turn and Welt shoe are discussed in relation to themselves, while the other four are discussed in relation to each other. This is necessary inasmuch as the last four are all shoes of one type, the McKay type.[2]

1. Welt The main feature of this shoe is its sturdiness, combined with flexibility and comfort. The process used, the welting, makes the shoe one that will be firm and will hold its shape after much wear. It also gives a high degree of comfort due to the fact that there is nothing under the foot except the flat surface of the sole, there being no joining material between the inner and outer soles even. This shoe is so sturdy that it can withstand wet weather very well. Any desired weight of material can be used in construction. In appearance it is solid and sturdy.

2. Turn This shoe is made of a lightweight construction that is very flexible, holds its shape, and fits very comfortably and well. The process used, single

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1. See Appendix F for discussion of these points.

2. The cement shoe is really the same as the McKay, except that the staples and thread are replaced by cement. The nature of construction is, however, identical.

sole and turning inside out, assures the highest degree of lightness and comfort; and since the shoe is pulled to its limit of elasticity it will hold its shape. The single joining medium between sole and upper and that being thread, makes it capable of being unaffected to any great extent by water. In appearance it is the lightest and most dainty of all shoes.

3. Littleway Lockstitch This shoe is a firm and sturdy one and remains so after wear. It can be made in any desired weight, its appearance naturally depending on the particular material chosen. For comfort, fit, wear, flexibility, it is about the best of the McKay type of shoes. Water will not effect the joints.

4. Full Uco Lockstitch It is recalled that the only difference between this process and the Littleway Lockstitch is that this one uses cement in lasting in place of staples. The advantage is obviously that there will be less foreign matter under the foot and hence more comfort and flexibility. An important feature of this shoe is that it is easier to last with cement than staples. However, the offsetting disadvantage is that it cannot stand as much heavy wear as the Littleway. In appearance it is just a bit lighter than the Littleway.

5. Uco Cement This shoe offers the most inexpensive process and the quickest one. The cement throughout, causes the shoe to be of little use in wet weather,

and gives the wearer a shoe that is not very flexible. The main advantage besides price and time, is the ease of operations and the fact that the shoe will stand out remarkably in the box. It is a light-weight dainty shoe when new, but will not hold its shape.

6. Colton This shoe has all of the advantages that are inherent to cement shoes, such as ease of most operations, standout quality, time and cost advantage, but at the same time has less of the disadvantages of most cements, due to the staples being used in the instep and the upper being sewed along the bottom. There is more ability to hold the shape of the shoe, it will fit better, and will be more comfortable and flexible.

Appendix G shows a composite picture of the above comparisons. It was arrived at in the following manner.[1]

1. Each feature was taken separately, such as flexibility for example.
2. The six processes were listed in the order they would come in this respect.
3. After all characteristics were taken separately, they were listed as above, after changing the relative positions in the single lists to numbers that were rough estimates of the value of each process's position in the list.

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1. See Precision Discussion. Also see Appendix F for data on characteristics.

COSTS

In costs for shoes, there is not a great deal of significance as found from the data, as it exists in actual figures. One reason for this is that it was found that the cost difference due to the six selected processes, all making the same grade and type of shoe, was almost negligible;[1] whereas the cost difference due to different styles and different materials, in shoes made with the same process was comparatively great.[2] The figures on the cost difference due to processes were selected for the price range of $4.00 inasmuch as that is the price that was found most profitable for the preceding year. It therefore represents the range where probably the most number of factories are located, if not for that year, at least for the following one.[3]

However, there are other factors that can be considered. The costs as in the data, is for labor and material only; no mention is made of overhead. Since the price ranges to be considered are of such a large range, it is very possible to determine the relative costs of the selected processes.

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1. See Appendix, Plate D-1 and D-2.

2. See Appendix 2 for figures. This process, Colton, was chosen for accuracy, see Precision Discussion.

3. For figures on most profitable range, see Appendix B-1, B-2.

There is first of all the figures on the cost of material and labor, which will be the greatest part of the sum total. There is also the overhead, which can be considered as consisting of (1) the time element, (2) the ease of operations, and (3) the need for skilled or unskilled labor.[1] The final factor is the need of good material, or the absence of such need.

The labor and material costs are taken from the figures.[2] This item will be counted as 60% of the entire cost.[3]

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1. The elements of overhead here considered are excellent ones for determining whether the process is suited for large or small scale production. However, this investigation is concerned with the most suitable process for making various kinds of shoes in the different price ranges. It is assumed that the process that is selected for any one use in any one range, will be manufactured in the manner most profitable to the manufacturer. A search into this subject is beyond the scope of this investigation. It should also be noticed that only those items of overhead that depend on the process used, are being considered.

2. See Appendix D-1, D-2.

3. It should be remembered that the relative costs are all that are needed. The fact that the labor and material are accurate figures, makes it possible to have results good enough for the wide range of price classifications, with the remaining items of cost only roughly accurate. Furthermore, since the accurate figures represent 60% of the total and since they are accurate, the results are well within the needed accuracy.

Each item of the so-called overhead, will count as 10% of the total. To find the exact figure for each process under each item, the processes are arranged in approximate order as far as any one element is concerned.[1] For example, for the element "Time" we have the following:

WELTS.....9

TURNS.....10

LITTLEWAYS.....7

UCO LOCKSTITCH.....6

COLTON.....5

UCO CEMENT.....3

The fact that certain processes need good material will count as 10%. Here Turns need good material always, and Welts need only fairly good material; so they are the only ones to be considered under this element.[1]

The following table is a complete picture of this comparison.

RELATIVE COSTS OF SELECTED PROCESSES

The Turn shoe is taken as unity, or as having an index of 100.

Turns.....100

Welts..... 83

Colton..... 64

Littleway Lockstitch.... 63

Uco Lockstitch..... 63

Uco Cement..... 55

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1. See note 3. on previous page. Also see Appendix F for data on chosing these positions and giving them their values.

DISCUSSION OF CONCLUSIONS[1]

In the analysis of the data it was found that there were certain true facts about the shoe trade, and it was shown how other facts could be drawn with equal truth from the case material. There were definite ranges of retail prices found; as were there specific uses to which a shoe was put. It was shown that there were structural advantages and disadvantages of all of those processes chosen as worthy of consideration for making shoes for any purpose; and it was shown that the selected processes could be compared as to cost.

Thus there are on the one hand, certain ranges of prices and certain uses of shoes, and on the other, some six processes that were found to be the best of all that were originally considered. Conclusions must be drawn as to which processes should be employed for each of the price ranges and which should be employed for each use of shoe.

PRICE RANGES AND THE PROCESSES THAT SHOULD BE MADE IN EACH

To draw conclusions as to just what processes should be made for each price range it is a simple matter of comparing the two classifications concerning prices and costs.

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1. See page 10 for conclusions.

For simplicity the price classification will be referred to as large volume, medium volume, and small volume, retail prices.[1] The reason for chosing the larger divisions is that the nature of the data on costs shows that there is no great difference among the processes, and consequently there is no need for minute classification of prices.

The analysis[2] of costs showed that with Turns used as a unit, with an index of 100, the relative costs were, Turns 100, Welts 83, Coltons 64, Littleway Lockstitch 63, Uco Lockstitch 63, and Uco Cement 55.

This analysis was not taking into account the possibility of all shoes being made in high price ranges. That is, there is no reason for not taking a cheap method of construction and making an expensive shoe simply by using the best of materials. Inasmuch as the McKay type of shoe, and that includes the cement, was made originally to give a shoe that attempted to have the advantages of the Turn or Welt, with a much lower cost of production. It is seldom that this is thought of. However, it is possible to do so.

For the high price range, or small volume range, Welts and Turns are to be placed.

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1. See Plate A-1 in Appendix for full classification.

In the medium volume range, there can be Coltons, Littleway Lockstitch, Uco Lockstitch, and Welts.

In the large volume range there can be Coltons, Littleway Lockstitch, Uco Lockstitch, and Uco Cement, with the latter by far the most inexpensive.

USES AND THE PROCESSES THAT SHOULD BE MADE FOR EACH

To determine the processes that should, or could, be properly made for each use of shoe, it is necessary to consider the structural advantages and disadvantages of each process and compare them with the desirable features of each class of use.

For the Active Sport Shoe, the first requisite is that there be durability.[1] The shoe must stand rough wear, and in so doing hold its shape and comfort. Cements are automatically eliminated since they were shown to be unsuited for rough or wet wear. Turns are evidently too dainty a shoe to consider in this case. Therefore, we

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1. See Appendix F for detailed discussion of advantages and characteristics of each process. See analysis of data for summary of the same points. This holds for each use of shoe as it is discussed below. For example--it is very easily seen how each process is placed for its proper use by considering the uses, given in Appendix E-1, and then looking at the summary of structural advantages in Appendix G. A glance will show that Welts and Littleways are the only ones to be considered for active sport wear.

have Welts and Littleway Lockstitches left. Both of these shoes are suited ideally for active sport wear. They are effected the least of all processes by weather conditions, they can rely on their sturdy construction to withstand the roughest of wear, and they have nothing that will cause discomfort to the wearer.

Spectator Sports have the two-fold duty of demanding a certain amount of active use and having a dainty, stylish appearance. Cements are dismissed for the reason that they would not be suited for the active part that this shoe might be called on to play. Turns are ideal in this case: they have the highest degree of style and lightness, and they can stand a considerable amount of wear and tear without losing their advantages. For the same reason, Littleway Lockstitch shoes should be considered. They too, can combine the necessary attributes of the spectator sport shoe. Welts are of too sturdy a construction to be used for this shoe, inasmuch as they lack the lightness needed.

Tailored Town Shoes have the same needs as the Spectator Sports, that is, they need a combination of lightness for appearance, and sturdiness for walking. The exact degree that either need is important depends on the costume that the shoe is to match. For a very rough "tweedy" or sport costume, the sturdiness will be the main thing both for looks and for use. In this case, the Welt shoe

should be used. However, there is also the need for the dainty appearance predominating, when the street costume is ultra-dressy or when the wearer is walking mostly only from the car to the store. In this case, the Turn and Littleway Lockstitch should be used, for the same reasons that they were used for spectator sports.

Formal Afternoon Shoes have only light, stylish, dainty appearance to demand. Every feature of the Turn is in line with the needs of this use, so it is the first to be considered. The Uco Cement, can offer all of the desired features, if we accept the fact that their buyer is going to use the shoe too little to be interested in wear or ability to hold shape, or withstand bad weather, (the cement process, it is recalled, is the best one for giving a good appearance when new) so it too should be considered. The third shoe to use in this case is the Colton. This has all of the attributes of the plain Uco, and the added ones that are given by a tightly lasted instep, and a sewed upper. (These would be comfort, better fit, and ability to hold shape longer.)

Evening Shoes have the same needs as the formal afternoon shoes, and therefore the same processes are chosen, Turns, Uco Cements, and Coltons. Here as in the above case, it is remembered [1] that in the lower price

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1. See Analysis of Data.

ranges, the buyer is interested mostly in the first appearance of the shoe. (This is particularly true for evening shoes, which are not worn much in any case compared to most uses.)

DISCUSSION OF RECOMMENDATIONS

There is little to discuss in regard to the recommendations that have been made. Accepting the conclusions, all that remains to be explained is the manner of uniting the two selections made there, the list of shoe processes possible for each price range and the list possible for each use of shoe.[1]

HIGH PRICE RANGES

In combining the lists themselves, we have the five uses of shoes to consider in each of the three price ranges. What shoe should be made for an Active Sport in the high priced range? Welts and Turns are all that there are to consider, and Welts is the only one of these two that should be used for active sport shoes. So the Welt process is the one recommended for an active sport shoe in the high price range.

The same reasoning will show that Turns should be made for spectator sports, formal afternoon, and evening shoes.

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1. Attention is called once more to the "Method of Attack" where the general plan of attack is discussed. Also see Appendix for the two lists and the resulting one.

Street shoes have two uses, as was pointed out in the conclusions, one for heavy wear, and one for light wear. The Welts and Turn constructions are chosen for the two uses, if the same reasoning is applied as in the above cases.

MEDIUM PRICE RANGE

Again we use the same method of arriving at our recommendations as we did in the high price range.

For active sports, Welts are recommended. Littleway Lockstitch shoes could be made in this class, but of the two processes, that and Welt, the Welt shoe is the most durable, and sturdy, so it is best to use it.

Littleway Lockstitch shoes are chosen for spectator shoes.

For street shoes, Littleways or Welts are recommended.

Colton is chosen as the process for both the evening and afternoon shoes.

LOW PRICE RANGE

Littleway Lockstitch is recommended for active sports, spectator sports, and street shoes.

Uco cement shoes are recommended for evening and formal afternoon shoes.

APPENDIX

RETAIL PRICE CLASSIFICATION

LARGE VOLUME	MEDIUM VOLUME	SMALL VOLUME
$2.00 AND LESS	$4.40 TO $5.00	$8.00 TO $8.50
$3.00 TO $3.95	$6.00 TO $6.60	ABOVE $8.50

PLATE A-1

RETAIL PRICE CLASSIFICATION

Plate "A" shows the retail classification of prices that is used by the National Shoe Retailers' Association. The large divisions, large volume, medium volume, and small volume, are the three ranges that they use in their investigations into retail trade.

The further, smaller divisions are those used by a Boston Shoe Stlye Show Committee, and it will approxamately agree with most opinions on the question of price ranges.

The largest group selling shoes under $2.00 are the catalogue houses. (Montgomary Ward)

The $3.00 group are mostly chain stores. (Arlace)

Shoes retailing between $4.40 and $5.00 are sold by chain and individual stores. (Beck and Wise)

The price between $6.00 and $6.60 is typical of the average department store. (Jordans)

The $8.00 to $8.50 shoe is characteristic of individual stores. (Thayer McNeil)

Shoes retailing above $8.50 are sold mostly by the expensive department stores and factory owned stores.(Saks Fifth Avenue, I. Miller, Delmans)

PLATE B-1

OPERATING RESULTS FOR 1932
ACCORDING TO VOLUME GROUPS

TOTAL SALES = 100%	ALL STORES 1932	SMALL VOLUME UNDER $30,000	MEDIUM VOLUME $30,000 TO $75,000	LARGE VOLUME OVER $75,000
Pay roll	18.5%	18.2%	18.4%	19.2%
Rent	6.7	6.7	5.9	7.4
Advertising	2.9	2.7	2.7	3.6
Other expense	7.5	7.2	7.6	7.6
TOTAL EXPENSE	35.6%	34.8%	34.6%	37.8%
Gross Margin	30.0	29.4	28.9	32.3
Operating loss	5.6%	5.4%	5.7%	5.5%
Discount + other income	1.4	1.0	1.6	1.7
FINAL NET LOSS	4.2	4.4	4.1	3.8
DECREASE ($) 1931 TO 1932				
Sales	23.7%	23.1%	24.4%	23.8%
Expense	15.1	13.8	17.0	16.2
Stock	18.0	19.7	18.2	11.9
Stock turn (per year)	1.7	1.7	1.9	1.8
Sales per full time person	$8,175	$7,680	$9,120	$8,285
Hosiery (% of total sales)	5.5%	4.6%	5.5%	7.8%

COMMON FIGURES - ACCORDING TO BEST SELLING PRICE

	ALL STORES	BEST SELLING PRICE		
		$4 AND UNDER	$4 AND $5	$5 AND ABOVE
PAY ROLL	18.5 %	17.8 %	17.6 %	19.8 %
RENT	6.7	6.2	5.9	7.6
ADDVERTISING	2.9	2.3	2.9	3.4
OTHER EXPENSES	7.5	6.1	8.5	8.2
TOTAL EXPENSE	35.6 %	32.4 %	34.9 %	39.0 %
GROSS MARGIN	30.0	29.0 %	28.2	32.6
OPERATING LOSS	5.6	2.5	6.7	6.4
VOLUME LOSS	23.7	21.1	22.4	25.5
STOCK TURN (TIMES PER YEAR)	1.7	2.0	1.8	1.7

PLATE B-2

OPERATING RESULTS

Plate "B2 and B1" show the operating results for 1932 retail stores, classified according to the volume groups of plate A.

The average store showed a final net loss of 4.2 per cent of its sales. Its volume fell 23.7 under that of 1931. At the same time expenses were cut 15.1 per cent and stock was reduced 18 per cent. The average expense was 35.6 per cent and the average gross margin 30 per cent.

Plate "B-2" gives the figures for stores classified according to the different selling prices. It shows that the most profitable range was around $4.00.

ANALYSIS OF SHOE COSTS:

(A) BY STYLES
(B) BY MATERIALS

PATTERN AREA KK	PATTERN AREA FEET	PATTERNS-MATERIALS	LABOR CUT	LABOR FIT	LABOR FIXED	BASE COST TOTAL	CONSTANTS FIXED	CONSTANTS PTN	DETERMINABLE COSTS TOTAL	COST OF UPPER	TOTAL	MARK UP	ENTIRE	SELLING PRICE	Δ P −	Δ P +
			+	+	=	+	+	=	+	=						
8	1.40	SEAMLESS - BLACK KID	.1209	.1215	.6250	.8674	.8942	.1087	1.8713	.6600	2.5313	.8438	3.3751	3.50		.12
8	1.74	REGINA - - - - - " - -	.1464	.1350	.6250	.9064	.8942	.1111	1.9115	.6090	2.5205	.8151	3.3356	3.50		.16
8	1.91	PLAIN BLUCHER - " - - OXFORD	.1926	.2600	.6250	1.0776	.8942	.1928	2.1646	.6685	2.8331	.9477	3.7808	4.00		.21
8	2.08	GORE PUMP - - " - -	.2200	.4000	.6250	1.2450	.8942	.1988	2.3380	.6260	2.9640	.9913	3.9553	4.00		.4
8	1.87	FANCY OXFORD - " - -	.2979	.4200	.6250	1.3429	.8942	.2108	2.4479	.6545	3.1024	1.0375	4.1399	4.00	.13	
8	1.25	TRIM SANDEL - - - " - -	.1716	.5300	.6250	1.3266	.8942	.2401	2.4609	.7105	3.1714	1.0705	4.2319	4.00	.24	
8	2.0	STRAP - - - - - - - " - -	.1604	.3100	.6250	1.0954	.8942	.1386	2.1282	.7000	2.8282	.9461	3.7743	4.00		.22
8	1.90	SEAMLESS - BLACK KID	.1209	.1250	.6250	.8709	.8942	.1111	1.8762	.6600	2.5362	.8488	3.3850	3.50		.11
9	2.02	" COLORED KID	.1284	.1310	.6250	.8844	.8942	.1111	1.8897	.8080	2.6477	.9026	3.5503	3.65		.10
4	1.35	" PAT. LEATHER	.0959	.1215	.6250	.8424	.8942	.1111	1.8477	.3780	2.2257	.7552	2.9709	3.35		.38
6	1.83	" CALF - - -	.1134	.1215	.6250	.8599	.8942	.1111	1.8652	.4565	2.3217	.7872	3.0989	3.35		.25
3	1.30	" BASIC FABRIC	.1001	.1215	.6250	.8466	.8942	.1111	1.8513	.2560	2.1073	.7158	2.8131	3.35		.53
10	2.08	" COLORED-SUEDE	.1234	.1260	.6250	.8744	.8942	.1111	1.8797	.7951	2.6748	.9039	3.5687	3.65		.8

PLATE C-1

FACTORY PRICES FOR SHOES OF CHART C-1

MATERIAL	SEAMLESS OR REGINA PUMPS	PATTERN PUMPS	PATTERN SHOES
BASIC FABRIC PATTERN LEATHER CALF	3.35	3.70	3.85
BLACK KID " SUEDE	3.50	4.00	4.00
COLORED KID " SUEDE BROCADES	3.65	4.00	4.15
DIFFERENCE IN PRICES	-.50	-.15	—
RETAIL PRICE	6.00	6.75	6.75

PLATE C-2

ANALYSIS OF COSTS BY STYLES AND MATERIALS

Plate "C I" is an analysis of shoe costs by styles and materials for shoes made by the Colton process. The chart used in making this analysis was obtained from an article in the "American Shoemaking" magazine, issue of March 29, 1933, and is self explanatory. The rulings of the headings show clearly the stages in the computation of a shoe cost,—that total labor is made up of cutting labor, fitting labor, and fixed labor (see below); that the base cost is made up of total labor, fixed constants, and pattern constants; that the base cost plus the upper material cost gives the total determinable cost, to which the markup is added to find the final cost.

The fixed labor costs are:

Stockfitting.....	$00.0500
Heel.....	.0850
Finish.....	.0800
Packing.....	.1600
Lasting.....	.2000
Indirect.....	.0500
TOTAL	.6250

The fixed constants are:

Upper lining.....	.0133
Doubler.....	.0132
Neverslip.....	.0100
Sock and pad.....	.0420

Backing.....	.0167
Sole.....	.1700
Insole.....	.0366
Counter.....	.0200
Shank.....	.0075
Box Toe.....	.0120
Heel.....	.1333
Findings.....	.0660
Cart and case.....	.0620
Stripping.....	.0077
Royalty.....	.o589
Last and patterns.....	.2000
Cement.....	.0250
TOTAL	.8942

The markup in this case(in this factory) is 25 and is made up of the following components:

Profit.....	5 %
Overhead.....	10%
Commisions.....	5 %
Discount.....	5 %
Markup	25 %

Part "A" is an analysis by styles, black kid being used by all of the shoes, so that only the style will vary the final cost. Sevsn standard types of shoes are used, from the plainest kind of pattern to the comparatively fancy one, from seamless pump to fancy strap.

The results of the analysis are evident in the

column marked "Entire Cost". Here it is seen that the cost varies from $3.33 to $4.23. This represents a maximum variation of $.90.

Part "B" is an analysis by materials. A seamless pump is used throughout, and the material varied. Again the results are evident in the "Entire Cost" column. The maximum variation in this case is $.59.

The last three columns in the chart are of particular interest to the manufacturer, in as much as they show plainly how much profit or loss is envolved in each shoe sold. Women's shoes are generally priced from the factory according to some such classification as:

1./ Plain pump...shoes having solely the counter and two quarters

2./ Pattern pump..those shoes made of a few more pieces than the first group, and still pumps.

3./ Patterns.....those that have a great many pieces

The materials are classified also:

1./ Basic fabric...Pattern leather, calf

2./ Black suede, black kid

3./ Colored suede, colored kid, brocades.

The factory prices are compiled from the above two lists, with consideration to costs of labor. (The factory in which this investigation was carried out, uses the prices that are shown in Plate C-2.

FACTORY COSTS

$3-$4 RETAIL IN DEPTS. AFFECTED	LITTLEWAY CEMENT	LITTLEWAY LOCKSTITCH	UCO CEMENT	UCO LOCKSTITCH	UCO SKELETON	SBICCA
A.- LABOR						
INSOLE STOCK FIT ----	.0050	.0060	.0106	.0106	.0106	—
OUTSOLE " " ----	.0158	.0146	.0158	.0146	.0158	.0308
LASTING ----------	.0574	.0574	.0632	.0632	.0657	.0675
BOTTOMING --------	.0267	.0463	.0240	.0463	.0257	.0350
TOTAL	.1049	.1243	.1136	.1347	.1224	.1333
B.- SUPPLIES + ROYALTIES	.0590	.0582	.0612	.0623	.0643	.0894
C.- MERCHANDISE						
INSOLE ----------	.050	.050	.050	.050	.050	—
OUTSOLE - EXTRA CUT	—	—	—	—	—	.040
INSOLE REINFORCEMENT	.004	.003	.004	.003	.004	.002
FILLER ----------	.005	.005	.003	.003	.002	.002
SOCK ----------	.024	.024	.024	.024	.026	.024
TOTAL	.083	.082	.081	.080	.080	.068
A + B + C	.247	.265	.256	.277	.267	.291

PLATE D-1

FACTORY COSTS

$3 - $4 Retail In Depts. Affected	McKAY SEWED		CEMENT				WELT
	TACK	LITTLEWAY	LITTLEWAY	UCO	COMPO	SILHOUWELT	GOODYEAR
A.- LABOR							
INSOLE STK	.0058	.0058	.0050	.0115	.0058	.0144	.0144
OUTSOLE	.0163	.0163	.0158	.0158	.0181	.0142	.0102
LASTING	.0553	.0603	.0574	.0632	.0645	.0474	.0474
BOTTOMING	.0279	.0279	.0267	.0240	.0354	.0479	.0635
TOTAL	.1053	.1103	.1049	.1145	.1288	.1239	.1355
B.-Supplies + Royalties	.0395	.0495	.0589	.0653	.0793	.0702	.0752
C.-MERCHANDISE							
INSOLE	.038	.031	.032	.033	.038	.057	.057
FILLER	.001	.001	.005	—	.005	.003	.003
WELTING	—	—	—	—	—	.030	.030
SOCK	.024	.024	.024	.024	.024	.015	.015
TOTAL	.063	.056	.061	.057	.067	.105	.105
A + B + C	.208	.216	.225	.237	.275	.319	.336

PLATE D-2

COST DIFFERENCES DUE TO PROCESSES

Plates D-1 and D-2 show comparisons of costs for the same type of shoe made by different processes. The shoe in this case is one that retails at a price that lies between three and four dollars. Only those items of cost that are changed by the use of different processes are considered, in order to make the comparison more compact.

In the first plate, six shoes are considered, which were chosen because they represent types of manufacturing that always come in direct competion with one another. For every adherent to any one process, there can be found an adherent to the remaining five.

The departments that are effected by labor are, stockfitting, lasting, and bottoming. The variationin cost is slight, the maximum difference being three cents.

Under supplies and royalties the difference is only a bit greater, the maximum being a tenth of a cent over three cents.

The maximum difference between the processes as regards merchandising is slightly over two cents.

The total figures show how small is the cost advantage of any of these processes over the others. The greatest difference between any two is just a bit over four cents.

The second plate is a similar comparison, with different processes selected. Two McKay type shoes are

chosen, four cements, and one welt. In comparing these shoes, it must be noticed that the welt and silhouwelt methods must have materials that are as inexpensive as the other shoes, a thing that is at the least not advisable.

The results are what would be expected, that the Welts cost the most and the McKay type shoes the least, but the actual difference in prices is surprisingly small. The maximum difference are: for labor, three cents; for supplies and royalties, four cents; for merchandise, four cents. The maximum total difference between any two processes is thirteen cents.

It is interesting to notice that the results of these plates and the plate C-1 show that the style and material in a shoe can vary the cost much more than can the method used for making it.

USES OF SHOES	
CLASSIFCATION	DESIRABLE FEATURES IN ORDER OF IMPORTANCE
ACTIVE SPORT	COMFIT SERVICE STYLE
SPECTATOR SPORT	COMFIT STYLE SERVICE
TAILORED TOWN	COMFIT STYLE SERVICE
FORMAL AFTERNOON	STYLE COMFIT SERVICE
EVENING	STYLE COMFIT _____
SANDALS ETC.	COMFIT STYLE _____

USES OF SHOES

Plate E-1 shows a classification of the uses of shoes, as taken from the reports of the National Shoe Retailers' Association. The following description of each type of shoe, shows clearly the desirable features of each.

1./ Active Sport.... This shoe must be ridgid and yet comfortable enough to permit rough wear in such activities as golf, walking, riding, etc. It must be able to withstand all kinds of weather.

2./ Spectator Sport.... This shoe is primarily for appearance, being worn on the golf club verandah, at the polo game, or on the deck of a ship. Therefore, it must have style, enough sturdiness to permit some activity, and ability to stand some wetness.

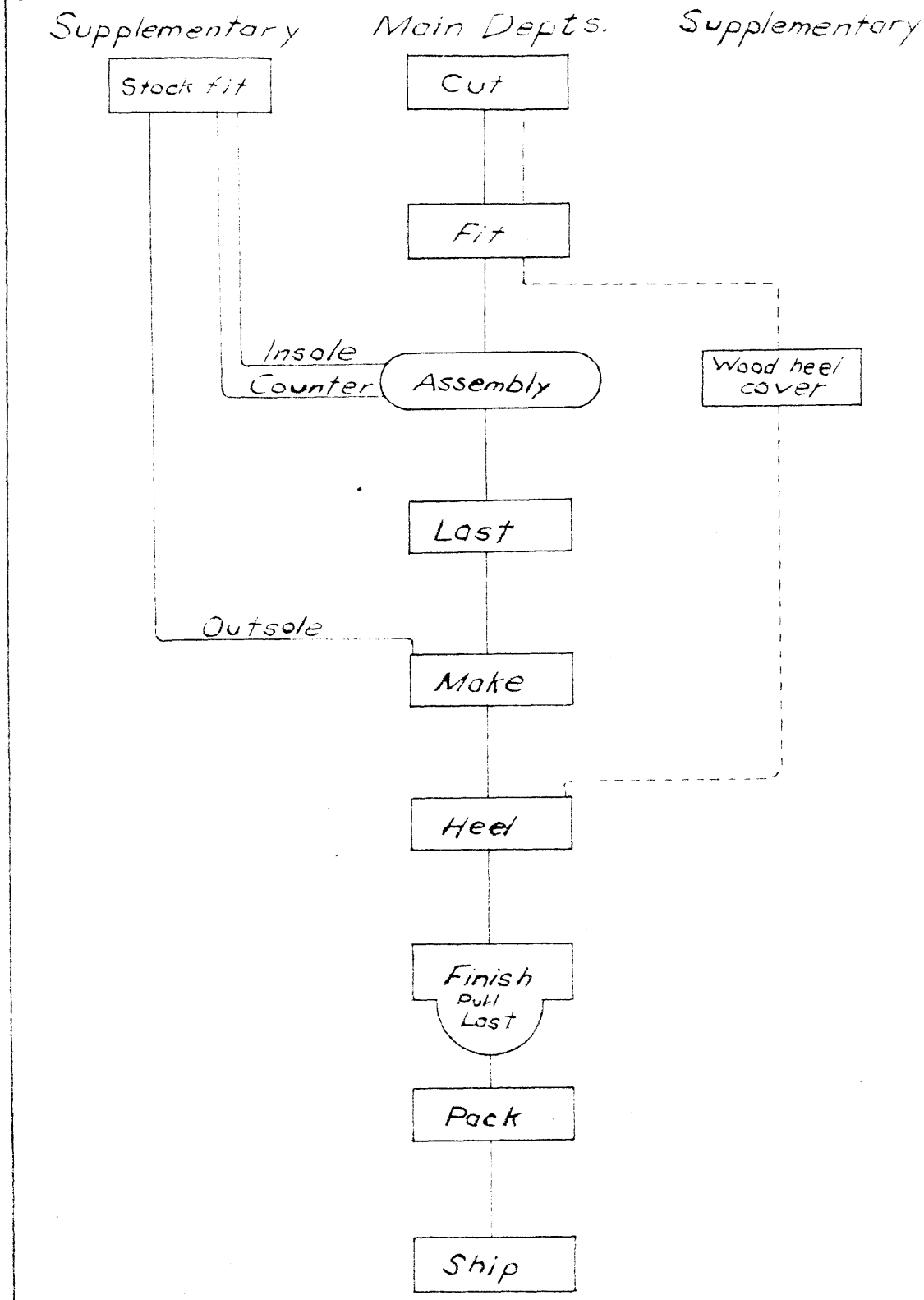
3./ Tailored Town....This shoe is to be worn with a street costume, and must consequently have style and enough sturdiness to stand a great deal of walking. It ought to be capable of withstanding bad weather.

4./ Formal Afternoon....This shoe is for formal day dress and must give a light, dainty, stylish appearance. It is not affected at all by weather conditions.

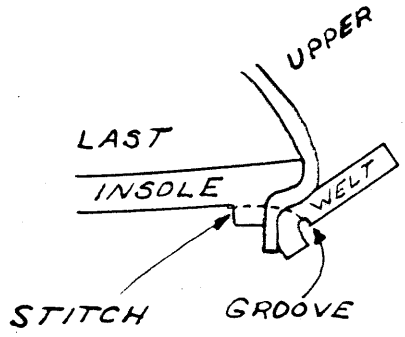
5./ Evening.... This shoe is for formal evening wear, and consequently demands a light, dainty, stylish construction with particular emphasis on comfort. This shoe will always be dry, it is assumed.

PLATE F-1

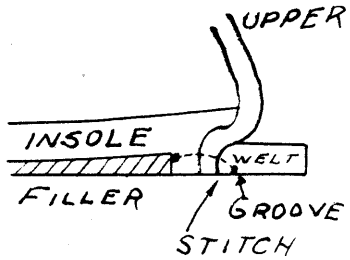
SEQENCE OF OPERATIONS



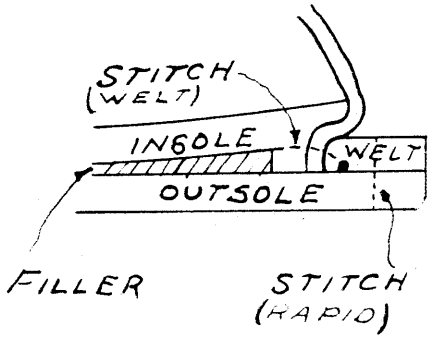
WELT OPERATIONS



a. After Welting

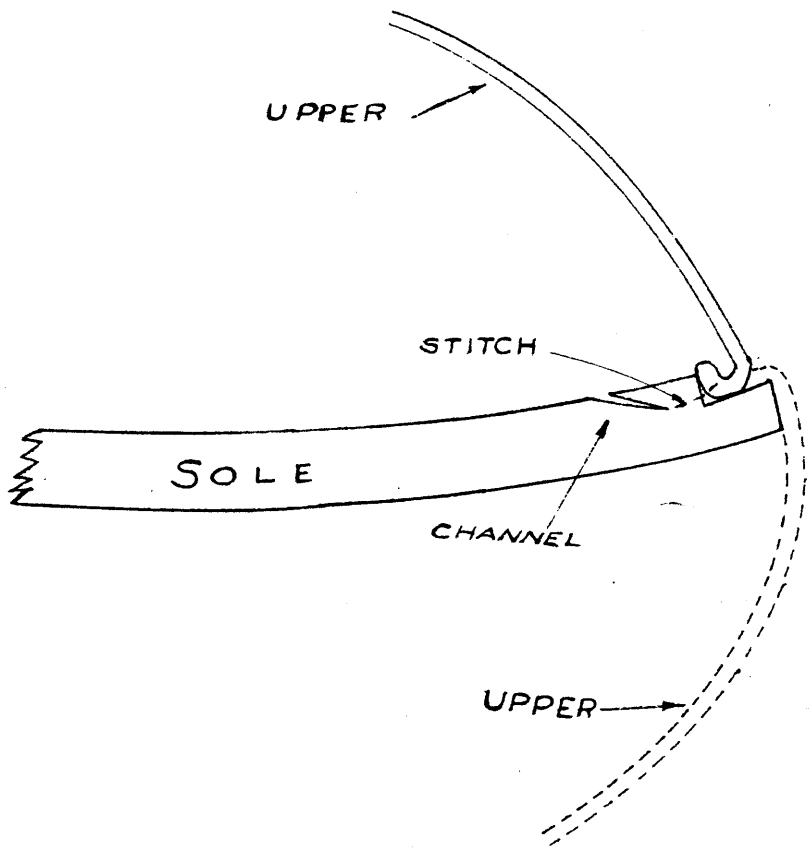


b. After Welt Beating and Inseam Trimming



c. Finished Welt

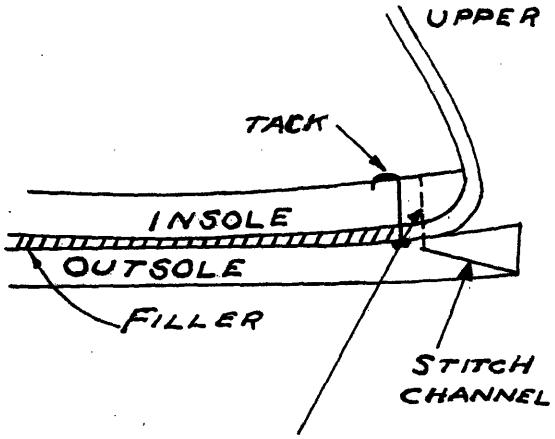
TURN SHOE



Full line upper is after turning.

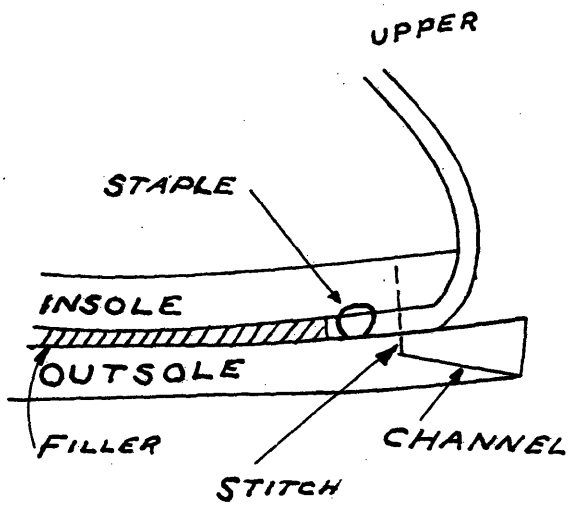
Dotted upper is before turning.

McKAYS



Tack lasted.

Foot touches tack and thread.



Staple lasted.

Foot touches only thread.

GENERAL DISCUSSION OF SHOEMAKING DIFFERENCES

In spite of the numerous methods for making shoes, there are few main differences in them that are basic; it is rather the various combinations of a few fundamental principles that make the number of processes so large. These differences occur mostly in the two main steps of manufacturing shoes, lasting and bottoming, or making.

Before discussing in detail the shoe manufacturing methods with which this thesis is concerned, a few pages will be devoted to these two operations, lasting and making, and to the steps that lead up to lasting--cutting, fitting, and stockfitting.

Because Goodyear Welts are so fundamentally important and have been for years the standard of "shoemaking" they will be discussed in detail. The other processes will be dealt with only in those features that make them distinctively different.

CUTTING

In the cutting department the parts of the upper are cut out of leather or cloth, so the work naturally falls into three divisions: cutting outsides, little leather or fabric; cutting cloth linings; and cutting leather quarter linings and sock linings.

Machine cutting is a method that has attained widespread use. The machine has metal dies that stamp out the pieces at the will of the operator. Here the cutter is allowed to use all his time and skill in placing the pattern in the proper position on the skin, for as soon as he has selected the cut, by tripping a pedal, the entire cut is instantly made, thus saving the time and labor of actually running the knife around the pattern. Its use is restricted to volume production, usually found only in cheap and medium priced shoes. The cost of the dies is so expensive that a greater volume of shoes is needed for efficient use than high grade factories ordinarily have.

Outside cutting requires the most skill. The cutter spreads a single thickness of material over his cutting block and, except where clicking machines are used, he cuts out the pieces according to metal edged patterns. Except for small appliques, the cutting of all parts of the uppers for shoes requires the greatest care that the firmness of the part shall be from "heel to toe". This is important in order to obtain uniform shoes as well as ones that will hold their shape in

wear. The cutter must therefore know the direction of greatest strength in the leather. (It is interesting that this is generally in the same direction as the hair of the animal.) He must also match the various parts that are to make a pair with respect to weight, color, and shade. He must avoid any flaws or imperfections in the skin, or restrict such imperfections to laps or lasting allowances--places that do not show in the finished shoe. The cut pieces are marked, tied, and sent to the Fitting Room.

The cloth cutters cut the cloth linings and doublers. Care is not needed, there being no flaws.

Lining cutting includes leather quarter linings and the sock linings. Here again there is no need for the skill or knowledge that an outside cutter must use, but even in the linings the firmness must be in the direction of the length of the shoe.

FITTING

The Fitting and Stitching Room is the department of the shoe factory where the different parts of the upper from the Cutting Room are processed and made into the finished shoe upper. The fitting of women's shoes is far more complicated than men's. This is because the millinery character of women's shoes calls for a variety of operations that never are used on men's uppers, and too, many fundamental operations have to be accomplished in a great many different ways. Hundreds of combinations of the operations are required in the women's factory. In fact, every style is a different problem. The fitting room in the modern women's factory is entirely different in the scope of its work from the same department of a factory fifteen years ago. The basic principles of lasting, heeling, finishing, etc., have for years been the same, whereas fitting has undergone a tremendous change.

It is interesting to consider that the change in character of women's shoes is directly traceable to the World War. At this time, the government limited the heighth of women's shoes as a conservation measure. Short skirts followed, whether or not for the same reason the writer is unable to say. At any rate, with the limitation of shoe height came low shoes, and with low shoes came fancy ones until today milady often wears shoes having only a strap across the ball with another around the ankle, toes and arch of the foot exposed, and that affair goes by the name of shoes. While this open

style shoe was a great aid in the development of some of the newer kinds of manufacturing processes, the effect it had on the character of the fitting room was the greatest of all departments of the factory.

As has been mentioned, the sequence of operations is "average", that is, it is more or less the sequence of the larger part of shoes. All shoes do not require all of the operations. In fact, few shoes use them all. The method of fitting is substantially the same for all types of lasting. The main points of difference so far as the different manufacturing processes are concerned are these: turn quarter linings are open at the back to permit its being tucked under the shank piece after the shoe has been turned, and a "never-slip" sewed for only a half inch at the top conceals this opening in the finished shoe; the lining of welts and McKays is closed all the way down; cement process shoes made by the Colton method must have their outside upper and lining stitched together. The finished upper, by being open all around the bottom, furnishes a pocket at the back in which the counter is placed, and being loose in the front, permits the box toe to be inserted at lasting.

Lining making is generally done in one part of the stitching room. It consists of skiving and closing the quarters of the linings and then vamping them to the cloth toe linings or vamp linings. They are then sent over to that part of the room where the top stitchers are until they are wanted there.

Pre-fitting is the term used by some factories to indicate those operations done to the parts of the upper while they are still in a flat condition before they are stitched together. These operations include stamping the case number on the various parts so that the corresponding parts will be assembled together elsewhere in the room; staining the smaller pieces to denote their sizes; skiving edges for either a light raw edge, or for a "pressed edge" sometimes referred to as a "folded edge"; cutting out small cutouts and narrow straps, etc., on the dieing-out machines; perforating or punching rows of holes along the edge of certain parts; pinking or finishing with a sort of saw tooth edge (if both are done, they are generally done in the one operation); marking for fancy stitching (or for perforating).

Ironing and reenforcing include the operations of ironing on back on the quarters; reenforcing their tops with tape; cementing doublers to the vamps; taping backseams.

Fancy and cutout stitching include cementing on small appliques, cementing together such parts as are too difficult to stitch by holding them together, and stitching such cemented parts and larger parts that nedd not be held by cement; stitching designs on vamps or quarters, stitching around perforations, etc.; stitching around cutouts. The regular fancy stitching is generally not through the lining-being merely through the outside of the upper. Cutout stitching makes a finished edge to the hole thus formed.

Finishing the edge of the upper is accomplished either by binding it with French cord or else folding the edge. In French cord work, a narrow ginding about 3/8 " wide is stitched to the edge on the outside, then the binding and inside edge of the shoe are cemented, at which time the cord is "scathed out" more or less flat. Then the cord is "turned", and the edge is made. All of this work is done before top stitching, and in this way the inside of the shoe presents a finished appearance. Folded edges are made by turning inside an extension of the upper which has been skived. A folding scarf is light at the outer edge but quickly goes to a heavier edge so that when it is folded or pressed, the stitching that holds the finished edge will go through the meat of the leather of the upper.

Top stitching is sewing around the tops of the uppers and through the lining. In French cord work the top stitching comes just under the French cord stitching when properly done. If top stitches are too high the shoe is weakened by the two rows of stitches coming on top of each other and thus sawing off the top. Lining in is simply the hand operation of placing the finished lining inside the finished outside preparatory for top stitching.

Vamping is the attaching of the quarters to the vamp. In most shoes it is done before top stitching, but in blucher shoes vamping is the last operation since the linings of the quarter are top stitched to the quarter, and the vamp

and vamp lining are put in at vamping, with the vamping stitch going through lining and all, with the layers sandwiched together.

The final operations are placing eyelets, punching strap holes, sewing on buckles, and barring which is the stitching of several strong rows at the front of the quarter at its intersection with the vamp.

STOCKFITTING

Stockfitting is the preparation of the heavy leather, that is the innersole and the outersole. (Leather counters are ordinarily bought from an outside factory, but handled in the shoe factory by the stock fitting department.)

The type of construction to be followed determines what operations are done to the insole in stockfitting. Except for "rounding", there are very few operations that are general to all types of shoe making. For instance, insoles of McKay type shoes are merely rounded and perhaps slashed at the forepart for flexibility. (Where composition innersoles are used in McKay types of shoe, the sole is died out instead of rounded since most of such materials do not undergo the regular rounding process.) Welt insoles have their channel formed.

The stockfitting done to the outsoles is first to make them uniform in thickness; next, to reduce the edge of the sole all around, or just at the shank, where ever in the finished shoe the edge is to be narrower than would be obtained by the full thickness of the outsole. McKays or Littleways are also channeled to take the seam. The Welt outsole, however, is not rounded or channeled until after it is laid on the shoe, up in the bottoming department in the factory. Here the roughrounder trimes, rounds, and channels. In cement shoes, the outsole is naturally only rounded, since there is to be no stitch. These are only the main things done. Other operations are: splitting Louis heel flaps; cementing; stamping case numbers; strip-

ping toes; reenforcing; etc.

LASTING

Drawing the upper over the last and attaching it to the insole tacked to the last bottom, is what the operation of lasting accomplishes, uniting at the same time the three layers of the upper which have not yet been joined along their bottom edges. In the case of the welt or turn construction, these steps are accomplished by first temporarily fastening the upper with lasting tacks, and later permanently fixing it to the insole by the welt or turn sewing. In the McKay and Littleway lasting, staples and tacks, respectively, go through the three layers of outside, doubler, and lining that make up the upper and hold them to the insole. Any process that does not use tacks or staples must provide means for holding the three parts of the upper together. In the Colton process this is done by sewing them with a Singer Sewing machine after the pullingover operation. In some cases cement is used as the only binding medium in lasting and in that case separate layers must be between the lining and the doubler, and between the doubler and outside, as well as the layer necessary to hold the upper to the insole. This brings out the importance of Latex cement in lasting. The paroxyln cement used in making the bond between the outersole and upper in cement fastened shoes tends to add stiffness to the sole. To eliminate all unnecessary sources of stiffness, cement construction frequently uses Latex cement for holding all parts together except in attaching the outsole, when the stronger cement is needed.

MAKING

The making department attaches the outsole to the shoe, and this operation is consequently sometimes referred to as "bottoming". There are three characteristic types of bottoms for shoes and all processes can be considered variations of these types.

The turn bottom even in the finished shoe is a single thickness of sole to which the upper is attached by sewing along the outside corner.

The welt bottom might be considered as consisting of two levels. The upper level is the insole with the upper and welt sewed to it, the welt projecting somewhat as the projection of the insole. The lower level is of course the outsole which is fastened to the welt. (Sketches of different methods appear below under each type of process.) Note that in this construction there is not a direct union between the upper and outsole which no doubt is one of the main features which allows such a heavy shoe to be so flexible.

The third type is the McKay botton. This consists of an insole and an outsole between which the margin of upper is "sandwiched". McKay and Littleway shoes, as well as most of the cement fastened shoes, are fundamentally of this type bottom.

The Sbicca, even though having a single thickness of sole in the middle, is a McKay type as far as the union between the upper and outsole is concerned; here the heart has been cut from the center of the insole and a corresponding

extra thickness left on the middle of the outsole; along the fastening, however, the upper is "sandwiched" between a margin of insole and the outsole.

In order to build up the level of the shoe through the middle to the thickness of the outside, caused in the McKay two-soled construction by the upper being "sandwiched" between the insole and outsole, and in the Welt by the thread and surrounding rib to which the upper was sewn, it is customary to employ a filler of either ground cork or a sheeting material cut to the proper size.

While Stitchdowns appear at first thought to be in a class by themselves, they can be considered as being basically of the McKay type bottom, where instead of having the upper sandwiched between the insole and outsole, it is sandwiched between the outsole and the stitchdown welt. The stitchdown welt holds the upper to the outsole, just as the McKay insole does. The Goodyear welt holds the upper in tight to the shoulder of the insole; the Goodyear seam is a much tighter seam than the stitchdown.

GOODYEAR WELTS

Welts have been made for a long time, just how long no one knows, but it is certain that the shoe's construction was understood by the sixteenth century European Guilds. The shoe takes its name from the welt that is sewed on the insole in the actual manufacturing process. It has been for years the standard shoe for all heavy wear and for all types of men's shoes. Its sturdy construction and yet non-ridgidness make it an ideal shoe for all heavy wear.

The operations of cutting, fitting, and stockfitting are first performed. These have been described in detail in the preceding sections.

In assembling, the insole is tacked to the last; and the upper, which has the box toe and counter between its lining and outside, is placed over the last and tacked at the heel to the proper height. In as much as the heel of the last is curved, it will cause the upper to fit improperly if care is not taken in fixing the part at the correct position.

The pullingover machine does the first lasting.

The shoe is next side lasted. That is, the sides of the upper are securely fastened on the insole. Formerly this process was done by hand, tacks being driven and later removed after the welting operation, but now a machine is generally used that staples the union. However, in very carefully made shoes, hand work is still found.

Next bedlasting finishes the union between the upper and insole. The bedlasting machine wipes the heel and

toe firmly and smoothly around the bottom of the last at these points; a strong wiping action pleats the flat upper making it conform to the contours of the toe and heel of the last. At this operation a wire is placed over the toe and held by tacks until the shoe has been welted.

The shoe is now ready for the welting operation which attaches a flat, thin strip of leather to the ridge of the insole sewing all at once the welt, the upper, and the insole. One edge of the welt has a groove cut out of it to take the stitch. The Goodyear Welt machine passes a curved needle through this groove, the upper, and part of the insole, the curved needle emerging on the bottom side of the insole. There is, therefore, nothing in the shoe to touch the foot except the flat surface of the insole.

Next the welt, upper and ridge are trimmed down to the welt seam. This is inseam trimming.

The filler is placed inside the welt as has been described under the section dealing with lasting in general.

The shank is placed on the instep to hold the shape of the shoe and to give reenforcement.

Cement is applied to both the outsole and the bottom of the shoe and they are pressed together. The outsole is still in its untrimmed state so must be trimmed down to the proper shape. In the same operation, if the stitch is to be concealed, a slit is made in the outsole, running from the lower edge up towards the center at an angle. After sewing, this slit is

cemented down again and thus the stitch is hidden.

The back of the sole is made ready for the heel.

Then the edge of the entire shoe is rounded.

A rapid chain stitch machine now sews the outsole to the welt.

The shoe is now "made". There remain, however, numerous finishing steps. To secure a decorative effect in the sole stitching, the shoe is passed through the stitch separating machine. This causes a blade to cut and pound parallel grooves on the welt between the stitches making them more pronounced.

The heel is either leather or wooden, depending on the use of the shoe and the wish of the retailer at the moment.

The edges are now trimmed and set. This polishes and finishes them.

The last is now pulled out of the shoe and there remain only the finishing steps of treeing, packing, etc.

Welts are especially suited for any heavy duty on account of the flat surface that is offered to the sole of the foot, there being inside the shoe no tacks or channels.

The flexibility offered is also a great advantage for such a heavy shoe. There is a slight "give" in the thread and welt, in fact in all of the unions, and an accumulation of these, results in a degree of flexibility that is very large for the weight and strength of the shoe.

The possibility of using any thickness of outsole, and the ease of repairing are other reasons that make this shoe ideal for heavy duty.

Until relatively recent years in order to get good tight lasting, welt shoes were pulled over the lasts by hand on one day, and on the following day the tacks were removed and the shoes pulled over a bit more. Today, however, good, carefully designed patterns properly graded to the lasts together with the use of the pullingover machine, allow the very best results with one pullingover process. The importance of this pullingover machine cannot be overemphasized. After the upper has been assembled on the last and tacked in the heel to the proper height, this machine drafts the shoe to the last by an ingenious arrangement whereby five pinchers pull the shoe forward over the last, straightening if necessary in any direction at the will of the operator who causes the machine to drive seven tacks, The main stress is applied by this machine, and not only should no subsequent machine have to pull so hard, but they should not be allowed to upset the proper strain which has been put in the upper by the pullingover machine.

SILHOUWELT

This shoe is made as an ordinary welt up to the bottoming process, where the outsole is attached by means of cement instead of by stitching. The main part of the holding is done by that part of the outsole that contacts the flat surface of the rib formed at inseam trimming.

The resulting difference is the fact that in this shoe the welt can be of almost paper thickness, since it does not hold the outsole on, whereas the Goodyear welt has to be strong enough to hold the outsole and consequently comparatively thick. This gives the shoe the appearance of a turn and offers the substantial comfort and support of the Welt.

TURNS

Just when the making of turn shoes began is not known, but it is certain that it is a very old process. Shoes have been found of this type in Roman ruins that date to the fifth century, and they are not unlike the shoes made today. The process of turn shoes was well understood at the time. As the name implies, the shoe is made inside out and then turned. It is used almost entirely today for the manufacture of women's high grade shoes, although in the past it has been used for men as well. This process fitted admirably the requirements for dainty footwear that the period immediately following the Great War ushered in. The construction of this shoe makes it the most flexible as well as the trimmest looking of all that are made, and it will undoubtedly never be surpassed in these particulars.

This shoe is really a mongrel make. It does not follow the same lines as all other shoes do. The entire construction with the exception of sewing is usually done by hand, for one reason, and the single sole eliminates a lot of the work needed on other kinds. It is this single sole that makes the great flexibility possible--that plus the few stitches that are needed and the fact that there are no tacks or staples.

The sole must be of particularly fine leather. It is rounded off on the edge and a channel is slit a varying distance from the edge, to permit the sewing machine to be drawn through it when the upper is joined to the sole. After the sole is soaked thoroughly to allow its subsequent turning, it is tacked to the last with the groove away from the wood, the tacks being

driven only part way into the last so that they may be withdrawn later. The shoe is now lasted, with the upper inside out. It is then sewed, the curved needle on the sewing machine entering the shoulder that has been cut along the edge of the sole, going through the upper, and part of the sole, and emerging in the groove that has been cut for it in the surface of the sole. The tacks are removed, and the excess leather is trimmed away. The last is taken out of the shoe. Now, by an ingenious and skillful manner, the shoe is turned, first the heel and then the toe. A new smaller last is inserted to relast the shoe in order to keep it in shape, care being used to take out any wrinkles that may be in the lining. The heel, usually wooden covered with leather, is put in place. Now the fore part is trimmed and the shoe is ready for the various finishing operations.

There is no question but that turn shoes will continue to hold their place in the head of all other makes of shoes as far as good, light weight, fancy shoes. No other kind can touch their place in dress shoes. However, the public has been using them for purposes where other kinds would be just as suitable if not more so.

TACK LASTED MCKAYS

McKay shoes are named after the man who made this process possibel, by perfecting a sewing machine that was able to sew the outsole to the insole. The original method was patterned about the time of the Civil War, and in fact owed its start to the necessity of making cheap shoes for the Northern soldiers. Since then there have developed four new McKay shoes that will later be described.

The tack lasted McKay differs from the Welt in the first place in that it needs a steel bottomed last, with a few holes through which the insole can be tacked to start the operations. After the insole is placed on the last, the upper is drawn over and tacked, the steel bottom causing the tacks to bend and reenter the insole, thus making the heads of the tacks lie in the center of the sole. The usual operations of trimming, laying the shank in place, and cutting the outsole down to the correct size are then performed. The Outsole is tacked temporarily and then the last is withdrawn. Now the shoe is placed on the horn of the McKay sewing machine which stitches the two soles together holding the upper in between the two. The stitch goes in through the bottom by a channel that has been cut at the corner of the outsole, as in the case of the Welt, passes through the upper and insole between the outside of the shoe and the top of the insole, in the inside of the shoe. The sewing machine forms a chain stitch, a very strong stitch that can be rapidly sewed with a great number of stitches to the

inch in comparison to the locke stitch. The heel is put on just as in the Welt, being wooden or leather as the case may be, and the shoe is finished in the same general manner. Gradually, however, a light lining is placed inside the shoe to cover up the stitches and the parts of the tacks that are showing in order to insure comfort to the foot and to make the actual construction of the shoe hidden from the eyes of the casual observer.

The argument used against the McKay shoe the most is that it suffers from having the last removed before the shoe has had a good chance to take the form intended. However, this is not a good argument against the process, as there is no reason why a last cannot be reinserted after the shoe is once made, as in fact is done in the turn shoe. The main trouble with this process is the uncomfortableness it offers the wearer in comparison to many other processes. The foot is treading on the stitches and the tacks, which not only gives a rough surface but also causes the leather under the foot to be more or less rigid. The tacks and stitches make the entire shoe a single unit, and much of the desirable features of welting to give flexibility is lost, if indeed it is not all lost.

The time feature is favorable to the McKay, on the other hand. There is no waiting for the shoe at any step while in process, and once the shoe is finished, it can be shipped. Until the advent of the cement and other modern methods, this factor was a strong aid to making this shoe popular among manufacturers.

LITTLEWAY LASTED MCKAYS

The only difference between this shoe and the one just described is the method of attaching the upper. In this case little steel staples are machine driven, connecting the upper to the sole by curving the staples through the insole so that the wire does not emerge on the top surface of the sole. In this way there is no foreign matter for the foot to tread on, as the tacks in the tacklasted McKay. All of the advantages are naturally retained, and this one main disadvantage is eliminated.

MCKAY WELTS

The name of this shoe adequately describes it--it is the welt shoe except that it is lasted with tacks or staples, usually the latter. Cheapness and speed are the only reasons for using this process, and it is not often found.

MOCK WELTS

There have always been attempts to copy an expensive shoe with a cheap process, as for example, welts that are made to resemble turns, Mckays that are made also to look like turns. Thus, this shoe is made to appear a welt. A regular McKay is made, and afterwards a welt is sewed onto the outside rib of the innersole, giving the welt, and the stitches along the edge of the shoe, the two outward characteristics of a welt shoe.

STITCHDOWNS

The stitchdown is named after the essential feature of the shoe, the upper is not tucked under the insole as in most cases, but is turned out at the sole line and stitched down to the outersole. This process has been known for a very long time, but has never been used at all extensively due to the difficulty encountered in lasting the upper tightly down onto the sole. Modern improvements have recently brought this shoe beyond the stages of experiment to the point where it is used in many factories with success, particularly in small sizes.

After the insole has been placed on the last and the upper assembled, the lining of the upper is lasted on the bottom of the insole with cement and the doubler and outside are turned out at the edge of the sole. Then a middle thickness of sole is placed over the bottom, covering the upper lining and the insole and projecting a bit all around in order to allow a place for subsequent sewing and attaching of the welt, The lasting machine then staples the upper to the middlesole. Just as in the case of the welt, there is nothing on the top of the insole to cause discomfort to the foot. The outsole is placed on the bottom of the middlesole and a welt is placed over it and the upper, and all are sewed together.

This shoe now offers most of the advantages of the welt as far as strength with flexibility is concerned, at a much smaller cost of production and more ease in making. The main trouble is that the staples that make the shoe firm are very easily rusted if the shoe becomes at all wet, and since the

sole of any shoe must occasionally meet with water, this happens causing the upper to pull away from the middlesole. Except for this defect, this shoe is a very sound one and suitable for manufacturer as well as wearer. If, however, this shoe was thread lasted even this defect would be eliminated.

GOODYEAR LOCKSTITCH

The goodyear lockstitch shoe is different from the goodyear welt only in the type of sewing that is used. In this case the lockstitch is employed, a new process that gives surer unions and more flexibility. The machine that is used passes two threads, really heavy, wax-soaked string, along the part to be sewed, each thread going along the outer surface a short way and then entering the inside of the part and being passed through a loop in the other thread. Now when the threads are pulled tight there is formed a small knot where the two are looped over each other. This knot in itself would be enough to hold the threads in place even if they broke in places and were no longer continuous pieces. The machine can be regulated so that the knot can be placed anywhere in between the two surfaces that is desirable, usually this is just below the center of the joined materials, the place where the greatest flexibility will be found.

This shoe is made exactly like an ordinary welt until the outsole is sewed on, when the lockstitch is used. Consequently, it has all of the advantages inherent to Goodyear Welts and it has the added advantage of more flexibility. The lockstitch has a single thread on top in place of the double thread of the Chain stitch. This double thread is useless in as much as it is below the knot that the tension occurs, so it is only a source of bulk that is not needed.

LITTLEWAY LOCKSTITCH

This shoe is the combination of two improvements, the lockstitch, and the littleway staples. The upper is lasted by staples, the filler is placed between the edge of the channel, and the outsole is attached by the lockstitch. It is to be recalled that the staples do not pierce the upper surface of the insole, and the lockstitch has only one thread running along the inside surface. Thus, there is a McKay type of shoe, with added comfort and flexibility. All of the quickness, ease of making, and cheapness, are present, and yet many of the disadvantages are removed--there is now only one row of thread under the direct contact of the foot, and the internal joints of the soles and upper are lighter and more flexible though just as strong as in the McKay.

For a McKay type of shoe it is obvious that this process is the best that can be found. It is possible, also, that the improvements used might make this shoe better for some purposes than other shoes that were at one time considered far superior to McKays.

UCO LASTED LOCKSTITCH

This shoe is lasted by means of cement, and bottomed with the lockstitch. The cement is applied on the upper and insole, and then instead of driving tacks to hold the upper in place as the pulling over is done, the operator merely presses on the place to be held.

In all except welts, the final sewing in addition to the cement will hold the shoe together firmely enough for all

purposes.b And since this lasting is quicker and cheaper, it seems like a very good contribution to shoe making.

SKELETON UCO LOCKSTITCH

This process is similar to the one above, except that tha soles used are of a different construction. Here the insole is in reality a ring off of the outsole, cut about one half inch from the outer edge and to about one half of the thickness of the outsole. The final steps reunite these two pieces into one unit. Advantages and disadvantages of this type sole are fully discussed under the Sbicca Process below, since it is from this process that the idea originated.

CEMENT SHOES

As has been mentioned, the process of using cement in the place of tacks, staples, or thread has been known for some time in Europe, though this process has not been applied until recently in this country. Until '29 it was the opinion of manufacturers in this country that there was no need to use cement, in as much as the only advantage seemed to them to be the relative cheapness offered, a thing that did not appeal to their ideas of making shoes, and a thing that was not demanded by the buying public. In the past few years however, it has become necessary both to make shoes less expensively from the manufacturers' point of view, and to make a new type of shoe that would offer the retailers something different from a salesmanship point of view. Once the attention of the shoe world was turned to cement shoes, however, and time and thought turned one method after another into a workable process, the cement shoe changed from an experiment to an accepted, almost standard manufacturing process. Now, there are many who think that cement will never be entirely replaced by the former means of attaching parts.

The various methods of making shoes that are the so-called cement processes are distinctive only in the number of steps where cement is used. The Silhouette, for example, attaches the outer to the rest of the shoe by cement; while at the other extreme, the Compo uses nothing but cement throughout the entire series of the process. In between these two, there are countless others that make use of the cement only in certain steps, retaining the old methods in the others.

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It seems logical to believe that cement will never be able to replace the sewing or the tacking where it has anything to do with attaching parts that are to be external, parts that will have excessive wear and tear. Water alone would be enough to spoil any union, and scuffing too would have this effect. However, as for the parts in the inside of the shoe, there is no reason why cement is not strong enough to do the work and do it well. Most of the hidden joints do not have to assume much strain or stress in any case. The ease and inexpensiveness of using the cement will undoubtedly keep it in use wherever it can perform the necessary work.

TACK LASTED McKAY

This shoe is made just like an ordinary McKay up to the addition of the outsole, the tacks being left in the insole. The outsole is attached by the means of cement.

There is absolutely no advantage to this shoe over the McKay, if the price factor is excepted. There is also the disadvantage of having a union that is made with an inflexible substance, the cement being very rigid compared to the stitches since the kind used on the outsole is necessarily a very heavy kind. Experience has shown, moreover, that a sole attached in this manner is not always secure.

TACKLASTED WELTOR NIGGERHEAD

This shoe is lasted with tacks that remain in the insole, and outsoled with cement. The same arguments hold here as in the tack lasted McKay. There is consequently, no real merit attached to the process.

COMPO LASTED

This was one of the first cement shoes that gained a good deal of attention, and one of the first to be discarded by the majority of manufacturers. The shoe is temporarily lasted with tacks. Later cement is applied between the parts under great pressure which allows the tacks to be removed. Then the outsole is attached with cement.

The fact that manufacturers have discarded this process quite generally is evidence that it is not a very good one. The main trouble is of course that the unions are not solid enough

and that the shoe is hard on the foot. Cement used throughout the entire shoe gives a result that is not good to the foot--there is ridgidness that causes discomfort, there is a great deal of material between the soles that cause the foot to tread on a rather unneeded amount of matter, and the shoe "draws" on the foot. The joints are not apt to remain fast.

LITTLEWAY LASTED CEMENT SHOE

This shoe is lasted by the Littleway process, using staples that remain in the shoe, and bottomed by means of cement.

There is decidedly an advantage in using staples in the middle of the shoe in as much as the construction is more firm, and the cemented outsole undoubtedly gives less expense. However, it is evident from what was said on cement shoe construction that the two processes, stapling and cementing, ought to be reversed for best results. That is, it would be better if the insole were attached with the cement and the outsole were attached with some ridgid means. Then the parts that were going to have the most wear and tear would be more fully protected. For this reason, this shoe is not made with a particularly good process.

THE COLTON SHOE

Here we have a shoe that is theoretically one of the best of those that use cement throughout the greater part of the processes. The upper is lasted by means of a light cement. The lining and doubler having been sewed together, however, makes it necessary to only apply a small portion of the fastening liquid. The cement is applied, and acts quickly enough to hold

the upper as it is pushed in the proper place, the laster using his pinchers to pull the shoe up where it needs it, and applying pressure instead of driving a tack. Often in carefully made shoes the instep is pasted by hand, and the use of tacks to give the shoe a more graceful and finished look. (The section on general principles showed the importance of close instep lasting.) The shoe is outsoled, after the intermediate steps have been performed, by a machine that cements the bottom on under great pressure that can be easily controled as to direction by the operator, the time necessary being a matter of minutes.

This saving is the most certain advantage of this shoe. There is no place where the operations have to be held up. However, just as in the case of all shoes outsoled by cement, time has shown that the wearer can not expect this process to give a staple article. In as much as this shoe is one of the bestof all cement shoes, the sewing of the parts of the upper and the lasting the instep by tacks giving a more solid and firm construction, and is still not really acceptable from the wearer's point of view, it seems conclusive proof that a shoe can never be made throughout with cement. At any rate, the majority of the better manufacturers have bourne this out by giving up their efforts to use cement entirely as a joining medium.

UCO SHOE

This is a shoe that conforms entirely to the requirements of a shoe that is to use cement. The name Uco refers only to the method of lasting, which is to use cement in this step. A special cement prepared by the originators of this process is

ideal for attaching the upper, and holds it tightly enough. The outsole can be put on in any manner whatsoever; in the part dealing with Lock Stitching it is recalled, the outsole was sewed on. However, the sole can be united with a heavy cement if it is desired. Here again, one runs up against the difficulty of having a permanent union.

UCO SKELETON

This shoe is made exactly like the one just described, the Uco, except that the insole is similar to that used in the Sbicca. The unsole is described in detail under the Sbicca process, which is below.

SBICCA SHOE

This process refers to the insole used, it being attached and the outsole being attached in any manner desired. A thick piece of sole leather is used for both the inner and outer soles. A piece of this is cut off, from the edges, leaving a sole that is about twice as thick in the center as at the edges. Thus we have for the insole a piece that is like any one with the center cut out, and for the outsole one that is like any with an extra thickness in the center, which comes from the hole in the insole. Now the shoe is constructed in any of the numerous methods, though cement is often used in some of the steps at least. When the bottoming is done, the two soles are united into the one from which they were originally cut.

The advantages claimed for this shoe are that there is only one thickness of sole and there is great flexibility due to

the cut going all along the edge of the sole, about one half inch from the outside. A single sole is naturally to be desired, but this one is in reality almost as thick as two ordinary ones, and has two thicknesses--there is the single thickness in the center, and there is this same thickness plus that part of the upper and joining mediums, cement or stitches, around the edges. For the good of the foot, a sole should cause the wearer to tread on a surface that is concave upwards. In this shoe, there is at least a strong tendency for a curve in the opposite direction. Since nothing can be placed in the center as a filler, this is evidently a disadvantage that can not be overcome.

As to added flexibility, there is no reason why this is true. For any flexibility to be present here over most shoes, the two parts of the surface under the foot, the parts on either side of the cut, must be free from one another to a certain degree. If so, the flexibility resulting will surely be a source of discomfort to the foot, for no foot is designed to walk on a surface which has parts giving by differing amounts. Futhermore, if the two parts are free from one another, the chances are that there will not be a union strong enough to hold the two parts firmly enough together.

Many manufacturers are now experimenting with this new process, which is one of the more recent ones. It seems logical to think, however, that the main reason for such serious consideration on their parts is due to the still present search for something new and different that will give a cheaper

production and a new selling product, the main reason it is recalled that motivated the universal turn to cement shoes a few years ago. Cement has definitely been found wanting by the experimentors; and there is no sign that a return to the former methods would yet be profitable to the marginal producer. It is not too rash, therefore, to conclude that his shoe has nothing to offer that will be of permanence.

FRESCO SHOE

Here we have a shoe that is one of the cheapest of the new ones. It is essentially a cement shoe throughout, with every detail used which gives an inexpensive product. The outsole is attached, for example, by cement and pressure is added by cold pounding the sole. There is no field for this process and there will never be a field. It is added to the list of processes mostly to give an example of the furthest end of those processes that are searching entirely for a cheap product.

MILLERWAY

The distinguishing feature of this shoe is the manner of lasting. The upper is pulled over roughly and a string is attached to the edge of the upper that has been pulled over the bottom of the last. Then the string, which has been treated so that it will shrink does the final pulling over.

The main difficulty in lasting is the necessity to pull the shoe over just right, a little bit more in some places than in others, a little more in the same places on different

shoes due to the difference in the texture of the leather. All machines that have been used to replace hand work have had to first find some means to allow for this variation. Consequently, it seems that this process is again to be added to the list of those that are offering a change without any really inherent advantages.

APPENDIX G

CHARACTERISTICS OF SELECTED PROCESSES

	WELTS	TURNS	LITTLEWAY LOCKSTITCH	UCO LOCKSTITCH	COTTON	UCO CEMENT
COMFIT	10	9	7	7	6	5
FIT	10	10	7	6	7	6
WEAR	10	9	9	7	8	6
SERVICE	10	10	10	7	8	6
STYLE	7	10	8	9	10	10
SHAPE	10	9	8	6	7	5
FLEXIBILITY	8	10	8	8	8	8
TIME ADVAN	0	0	5	7	8	10
LABOR[1]	Sk	Sk	Un	Un	Un	Un

1. Here, only the difference that exists between skilled and unskilled labor will be considered. Sk means skilled. Un means unskilled.

APPENDIX H

RELATIVE COSTS OF SELECTED PROCESSES

	LABOR, MERCHANDISE	TIME	SKILLED LABOR	EASE OF OPERATIONS	NEED FOR GOOD MATERIAL	TOTAL
TURNS	60	10	10	10	10	100
WELTS	55	8	7	8	5	83
LITTLEWAY	45	7	5	6	0	63
UCO LOCKSTITCH	45	7	5	6	0	63
COLTON	45	5	6	8	0	64
UCO CEMENT	40	4	5	6	0	55

APPENDIX R

The following factories were visited in the course of this investigation:

I. Miller, Brooklyn, N.Y. (Turns and Sbiccas)

E..P. Reed, Rochester, N.Y. (Welts)

Bowdoin Shoe Co., Haverhill, Mass.(Turns)

Leavett Shoe Co., Haverhill, Mass. (Stitchdowns)

C. B. Slater, Braintree, Mass.(Welts and Turns)

Daly Shoe Co., Lynn, Mass.(McKays)

Golden Rule Shoe Co., Lynn, Mass. (Compos)

Rickard Shoe Co., Haverhill,Mass. (Coltons)

Jonas Shoe Co., Haverhill,Mass. (McKays)

Spencer Shoe Co., Spencer, Mass.(McKays)

Bradley Goodrich, Haverhill, Mass. (Lockstitches)

Most of the retail stores in the down town district of Boston were of use in this investigation, as were many in New York. Of particular help were the following:

I. Miller & Sons, New York City.

Saks Fifth Avenue, New York City

J.J.MaHoney, Lawrence, Mass.

Golden Brothers, Albany, N.Y.

The following persons of the shoe industry were of inestimable help. Their advice during the entire investigation was ofteh called for, and readily given in each instance.

H. C. Rickard, U. S. M. C., Boston Mass.

E. M. Rickard, Rickard Shoe Company, Haverhill, Mass.

Mr. Everet Bradley, Bradley Goodrich, Haverhill, Mass.

Mr. Edward Cohen, Saks Fifth Avenue, New York City

Mr. Fred Cooper, Haverhill Man. Ass., Haverhill, Mass.

Mrs. Rooney, Lynn Union, Lynn, Mass.

Mr. William Welch, C. B. Slater, Braintree, Mass.

Mr. A. J. McCormick, Ryan Cement Factory, Lynn, Mass.

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