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SHOE CONSTRUCTIONS

By Roy C. Bowker

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PREFACE

Shoes are an important item in the budget of every family. Much general information is available concerning shoes and a multiplicity of types can be purchased over a wide price range. However, methods for use in evaluating the quality and performance of shoes are lacking.

Research work on shoes is being conducted at the National Bureau of Standards for the purpose of developing quality and performance standards in terms of value to the individual consumer. A part of the problem has to do with the influence of the type of construction on the ability of the shoe to hold its shape under simulated service conditions.

This circular presents the results of a study of the different methods of construction in common use. A review of the literature issued by the trade organizations has shown that there are at least 40 types of shoe construction, each of which is described briefly in this circular and listed under 8 main classes.

Comments on the performance of shoes and the value to the consumer of construction identification marks on shoes are included.

LYMAN J. BRIGGS, *Director.*

SHOE CONSTRUCTIONS

By Roy C. Bowker

ABSTRACT

This circular contains brief descriptions of 40 individual shoe constructions and discusses their classification under 8 main classes: welt, McKay, Littleway, turn, stitchdown, nailed, cemented, and moccasin. This classification is general because of the differences between individual constructions grouped in a single class.

An analysis of shoe production figures for the year 1935 is included, which indicates the importance of each class of construction in relation to the total number of shoes manufactured.

The circular also discusses the value to the consumer of marking shoes to show the types of construction, and touches upon the subject of their performance.

The circular gives a list of references to literature containing more detailed information on the subject of shoes.

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I. INTRODUCTION

Interest in standards for footwear is increasing, as evidenced by the demands of organizations and individual consumers for information regarding the methods of shoe construction in common use. Information on the comparative merits of shoes made by different methods is often requested. The feasibility of marking shoes as to the type of construction for the benefit of the consumer is a question frequently raised. If shoes are to be so marked, the first requirement is that they be classified into types according to construction methods.

A study of the available literature on shoe construction reveals no obvious and direct method for preparing a system of classification of

shoes by types of construction. In most cases the shoe consists of three main parts—the upper, the insole, and the outsole. The means used for joining these three parts (in some cases two parts, as in turn and stitch-down shoes, where no insole is used) constitute a method of construction. The names commonly used to denote types of construction are welt, McKay, Littleway, turn, stitchdown, nailed, and cemented. Numerous methods of construction exist, however, between which no differentiation would be indicated by the use of the few names just listed. This circular has been prepared for the purpose of presenting brief descriptions of the many individual methods of construction and of discussing the value to the consumer of classifying and marking shoes as to the methods of construction used in their manufacture.

II. WHAT THE CONSUMER IS BUYING

In order to secure a general idea of what the consumer is buying, an analysis of shoe production is presented for the year 1935, based on the statistics issued by the U. S. Bureau of the Census on April 19, 1937. The figures in table 1 are for leather footwear and account for about 98 percent of the total production. The remaining 2 percent represent athletic, sporting, part-leather, and part-fabric shoes. It will be noted that welt shoes rank first in production, followed in order by McKay and Littleway, cemented, stitchdown, wood or metal fastened, and turn.

TABLE 1.—*Production of leather boots and shoes during 1935*

[Percentages of different constructions according to use. Taken from Census of Manufactures, issued April 19, 1937]

Use	Type of construction						Total pairs
	Welt, including Silhouwelt	McKay, including Littleway	Turn	Wood or metal fastened	Stitchdown	Cemented	
	%	%	%	%	%	%	Number
Men's dress	87.0	9.8	0.1	0.1	2.8	0.2	68,081,083
Men's work	24.5	5.9	----	67.5	2.1	----	28,569,152
Boys' and youths'	38.1	20.4	0.3	32.7	8.5	----	18,499,550
Women's	19.1	37.3	3.5	0.1	7.2	32.8	146,286,398
Misses' and children's	15.8	19.3	3.7	----	59.0	2.2	43,521,279
Infants'	30.0	6.0	24.6	----	38.2	1.2	19,076,158
Percentage of total	35.1	23.5	3.1	7.8	14.7	15.8	----
Number of pairs	113,680,256	76,186,465	11,505,828	25,422,652	47,875,343	49,363,081	324,033,625
Average value a pair	$2.36	$1.51	$1.83	$1.59	$0.94	$1.86	----

Of the total number of shoes made, more than one-third are of the welt type, nearly one-quarter are McKay and Littleway types, approximately one-seventh are stitchdown, and about one-sixth are cemented. The turn type accounts for only about 3 percent of the total.

It will be observed that 87 percent of men's dress shoes are of the welt type. Thus an average of 9 out of 10 men in this class secure a welt shoe. In the case of men's work shoes 2 out of every 3 men use

a wood- or metal-fastened shoe. Similar interesting observations may be made for the other classes.

The analysis of the 1935 production figures is significant. It demonstrates that for any given use the choice of constructions is limited in 90 percent of the production to from 1 to 4 types. For example, of men's dress shoes 87 percent are of the welt type, while for women, 89.2 percent of the production is divided between the welt, McKay, Littleway, and cemented types.

These figures reflect chiefly the change in the type of construction now taking place. The cemented type accounted for 15.8 percent of the total, as compared with about 3 percent in 1932. This increase in the production of the cemented type has been chiefly at the expense of the McKay, Littleway, and turn shoes, and it promises to further increase.

If the average dollar value per pair serves as a fair index of the factory selling price, it is of interest to note that on the average, the welt type is the most expensive to make, the cemented type ranks next, then the wood- or metal-fastened followed by the McKay and Littleway. The stitchdown appears to be the cheapest type to manufacture. The value for turn shoes is not truly representative since the production is divided chiefly between women's and infants'. The dollar value of 5,060,774 pairs of women's turn shoes was $3.24, as compared with $0.45 for a comparable number of infants' shoes.

The simple classification system used in the Census reports is recognized by the industry and is available for use as a basis for the marking of shoes so that they may be identified as to type by the consumer at the time of purchase. Thus the words welt, McKay, Littleway, turn, metal-fastened, stitchdown, and cemented could be stamped or marked on appropriate shoes to indicate the method of construction.

The adequacy of these terms is discussed later.

III. UNITED SHOE MACHINERY CORPORATION CLASSIFICATION

A further study of the ramifications of shoe construction indicates that the descriptive terms used in the Census reports do not tell the whole story. In a pamphlet entitled How Modern Shoes Are Made, issued by the United Shoe Machinery Corporation, Boston, Mass., the following statement is made:

> The operation, or series of operations, by means of which the outsole is permanently attached to the other parts of the shoe is known as Bottoming. Every modern method used in shoe construction, and hereafter described, depends basically upon the means by which the outsole is attached to the other parts of the shoe.

Seventeen construction methods are listed under three fundamental groups with respect to the method of attaching the outersole. These are listed in table 2. It is obvious that the three fundamental group names would not be sufficient for marking shoes from the viewpoint of the consumer. For example, a welt shoe may be exactly the same in every detail except the method of sole attachment. In one case, the outsole might be sewed on, and in the other case it might be cemented to the upper part of the shoe. It should be mentioned that the 17 types of construction listed in table 2 do not cover all of the types that are in current use. Doubtless many variations and combinations exist about which there is no published information.

TABLE 2.—*Types of shoe construction*

[Types of shoes grouped by classes of construction based on the mode of attaching the outsole]

Sewed	Cemented	Nailed
Goodyear welt. Goodyear turn. McKay sewed. Stitchdown. Littleway lockstitch. Uco lockstitch. Pre-welt. Skeleton insole. Littleway-McKay.	Littleway staple lasted. Tack lasted. Cement lasted. Skeleton insole. Silhouwelt and cemented welt.	Loose. Standard screw. Pegged (wood).

IV. DESCRIPTION OF VARIOUS TYPES OF SHOE CONSTRUCTION

The many individual constructions listed in the literature are described briefly in the following paragraphs. The main headings follow, for the most part, the terms used in the Census reports.

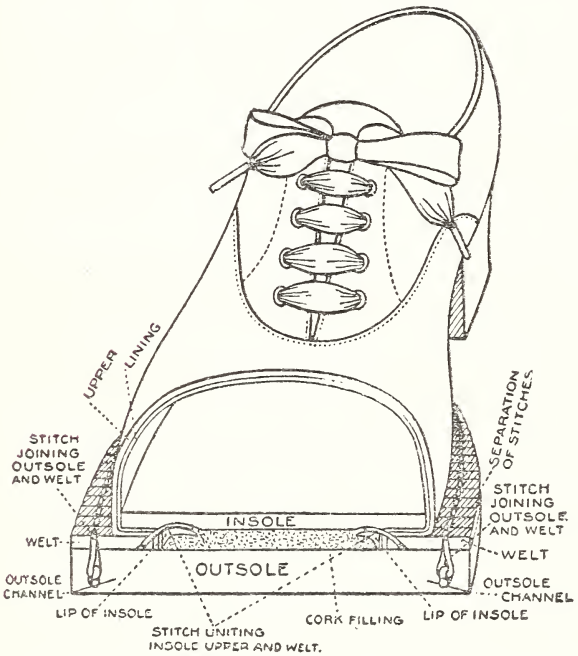

FIGURE 1.—*Construction of a Goodyear welt shoe.*

1. WELT

GOODYEAR WELT.—A narrow strip of leather, called the welt, and the lasting edge of the upper are stitched to a channeled lip of the insole. The outsole is attached to the shoe by means of stitching (lockstitch), which passes through the welt and the outsole. The insole presents a smooth surface inside the shoe since no nails or stitching pass through it. The shoe is sturdy, flexible, and can be repaired readily. (See figure 1.[1])

LOCKSTITCH THROUGH-SEWN WELT.—The lasting edge of the upper is tacked to the insole. The welt is then attached with a vertical lockstitch seam which passes through the welt, upper, and insole. The outsole is attached by a lockstitch seam which passes through the welt and outsole. Outwardly, the shoe appears the same as a Goodyear welt. The clinched lasting tacks and a row of stitching are visible on the insole inside the shoe.

[1] Illustrations from The Shoe Retailer's Manual, The Gill Publications, Inc., Boston, Mass.

Stapled Welt.—Same as the lockstitch through-sewn welt excepting that the welting is attached to the upper by means of metal staples instead of by means of a lockstitch seam. The U-shaped staples pass through the welt, upper, and insole, and are clinched on the inner surface of the insole. The outsole is attached with a lockstitch seam which passes through the welt and outsole. Outwardly, the shoe has the same appearance as a Goodyear welt. On the surface of the insole inside the shoe the clinched ends of the lasting tacks and the staples are visible.

Pre-Welt.—The welt is sewed to the bottom of the upper with a chainstitch. The lasting edge of the upper is cemented to the insole. The outsole is attached by a lockstitch seam which passes through the welt and the outsole. The insole is smooth inside the shoe. The insole is held to the forepart of the shoe by cement rather than staples or stitching as in the above types. Outwardly, the shoe appears the same as a Goodyear welt.

McKay-Welt or American Welt.—The lasting edge of the upper is tacked to the insole and a midsole is sewed to the insole with a chainstitch seam. The outsole is attached to the midsole with a lockstitch seam. Strictly speaking the shoe does not have a welt but for sole-attaching purposes the midsole serves the same purpose. Outwardly, it has the appearance of a Goodyear welt.

There are variations in making these shoes, each of which may be considered to represent a type of construction. For example, the midsole may be cemented to the upper or a half midsole may be used instead of a whole midsole. There also appears to be no reason why the outsole could not be cemented on rather than sewed.

Namrog Welt.—A shoe with the outward appearance of a Goodyear welt but which is presumably classified as a cemented shoe. The lasting edge of the upper is attached to the insole by means of tacks, staples, or by means of a combination of these and latex cement. Welting, fabric, and filler are so combined as to form a midsole assembly. The assembly is attached to the outsole by a lockstitch seam which passes through the welt and the outsole. Then this combination of midsole and outsole is cemented to the upper.

Cemented Welt or Silhouwelt.—A shoe constructed in the same manner as the Goodyear welt excepting that the outsole is cemented on rather than attached with a lockstitch seam. In this type not as much extension of the welt and outsole beyond the upper is necessary since stitching of the outsole is not required.

Del-Welt.—A shoe which has the outward appearance of a cemented welt but differs from all the above constructions in that no insole as such is used. It is a single or skeleton sole shoe. A single sole is ingeniously split to form two parts, one of which takes the place of the insole in preparing the shoe for receiving the other part which takes the place of the outsole. It is prepared in the same manner as Goodyear welts and the outsole is cemented in place.

2. McKAY

The McKay shoe is also known as a Blake sewn or machine sewn shoe. The upper is held to the insole by lasting tacks, which are clinched on the inner surface of the insole. The outsole, upper, and insole are then held together with a chainstitch seam. Thus the row

of stitching and the clinched lasting tacks are visible inside of the shoe on the surface of the insole. (See figure 2.)

A variation little used is that of cementing the outsole to the upper rather than stitching.

A further variation is the McKay-welt type of construction previously described.

3. LITTLEWAY

The lasting edge of the upper is secured to the insole with metal staples which do not penetrate through the entire thickness of the insole. The outsole, upper, and insole are then held together by means of a lockstitch seam. Thus a single row of stitching is visible on the surface of the insole inside the shoe and no clinched metal of lasting tacks is observed. (See figure 3.)

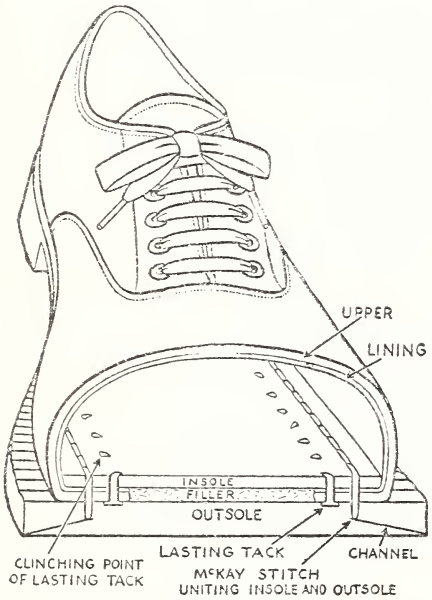

FIGURE 2.—*Construction of a McKay shoe.*

A variation of this construction is the use of a chainstitch seam rather than a lockstitch seam.

A further variation is the attaching of the outsole with cement rather than with stitching.

A further variation is side-lasting the upper with staples to an upstanding rib on the insole or to a fabric strip stitched to the insole. Prior to lasting, the margins of the insole, upper, and lining are coated with latex cement. The staples hold the upper and lining in position until the cement is set after which the rib containing the staples is trimmed off. Thus the forepart of the shoe has no metal fastening of any kind. The outsole is attached by a lockstitch seam which passes through the outsole, upper, lining, and insole. A single row of stitching (or two rows if the fabric tape is used) is visible inside the shoe on the surface of the insole.

4. TURN

The turn shoe is a single sole shoe and gets its name from the fact that the sole and upper are sewed together with a horizontal chainstitch, while the upper and sole are wrong side out on the last. The finishing requires that the shoe be removed from the last, turned right side out and relasted. A light-weight, comfortable, and flexible shoe is produced. (See figure 4).

5. STITCHDOWN

A. The simplest type of stitchdown shoe consists of two parts, the upper and the outsole. The lasting edge of the upper, instead of being turned in as when it is attached to an insole, is turned out. The upper and outsole are stuck together with cement on the last and further held together with a lockstitch seam which goes completely around the shoe.

B. A variation is the use of an insole and lining. The lasting edge of the lining is turned in and cemented to the insole. The lasting edge of the upper is turned out and both cemented and stitched to the outsole with a lockstitch seam.

C. A further variation is the addition of a narrow welt so that the lasting edge of the upper lies betweetn he welt and outsole. The lockstitch seam, in this case, passes through the welt, upper, outsole, and lining if the latter is used. The welt is used to protect and reinforce the upper.

D. A two-hole stitchdown is made by turning out the lining and upper, and attaching these to the insole by a chainstitch seam. In this case the insole is not contained within the shoe but is the same size as the outsole. A welt is used and the outsole is attached by a lockstitch seam which passes through the outsole, insole, lining, upper, and welt.

E. A three-sole stitchdown shoe has the lasting edge of the lining turned in and cemented to the insole. A midsole is then attached to the upper by means of a chainstitch seam. The outsole is attached with a lockstitch seam which passes through the outsole, midsole, upper, and welt. (See figure 5.)

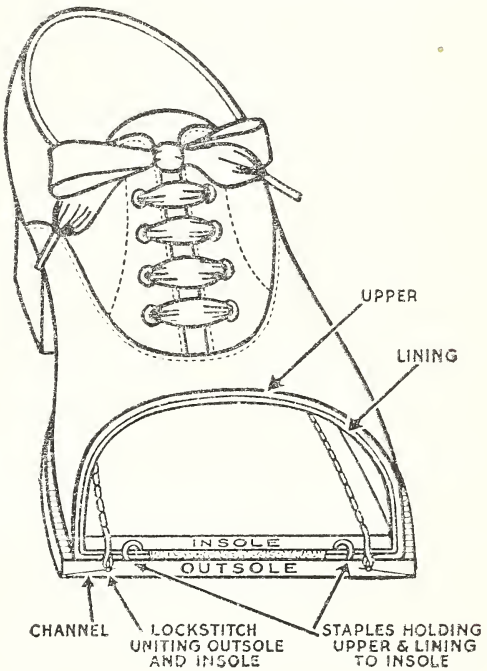

FIGURE 3.—*Construction of a Littleway shoe.*

A characteristic of all these shoes is that the surface of the insole is smooth and no stitching or metal parts are visible inside the shoe in the forepart.

There are other variations in construction such as the manufacture of types which have the upper turned in around the heel seat but turned out on the remainder of the shoe.

6. NAILED

This type of construction is used for heavy-duty shoes. The lasting edge of the upper is tacked to the insole. A midsole and outsole are stitched together with a lockstitch seam and this assembly is attached

to the upper with loose nails which pass through the outsole, midsole, upper, lining, and insole. The loose nails, as well as the lasting tacks, are clinched at the surface of the insole so that they are visible inside of the shoe.

There are many variations in this type of shoe. A storm-welt is sometimes placed between the upper and midsole. In some cases the midsole may be attached directly to the shoe before the outsole is attached. The use of wooden pegs and the "standard screw" for attaching the soles is also practiced. (See figure 6.)

7. CEMENTED

A. The lasting edge of the upper is attached to the insole by means of cellulose cement and the outsole is attached to the upper with cement. No tacks or stitching are used in this construction. (See figure 7.)

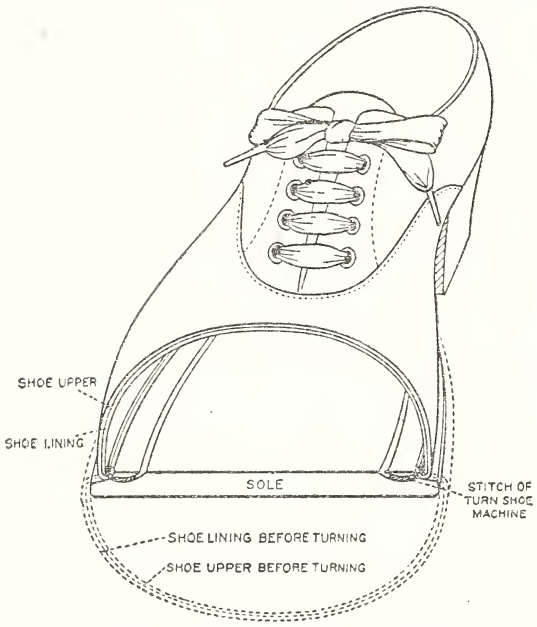

FIGURE 4.—*Construction of a turn shoe.*

B. A variation of *A* is that the upper may be lasted with tacks throughout, as in the McKay construction and the outsole attached with cement.

C. A further variation of *A* is that the upper may be lasted with staples, as in the Littleway construction, and the outsole attached with cement.

D. A further variation of *A* is that the upper may be lasted by means of tacks or staples in the shank portion and with latex cement in the forepart, with the outsole attached with cement.

E. The cemented welt or Silhouwelt has been described under welt construction. It is significant to note that the main difference between the cemented welt and the Goodyear-welt types of construction is that the outsole in the cement type of construction is attached with cement rather than by means of stitching.

F. The Namrog welt has been described under welt construction. It may be noted that, insofar as lasting is considered in construction, several types of this shoe may be made.

G. The single sole or skeleton sole shoe is made under such names as Sbicca and Del-Mac. The welt type of construction has been described under welt construction. Other types provide for lasting as in sections *B*, *C*, or *D* of IV 7, and attaching the outer portion of the single sole with cement.

8. MOCCASIN

There are possibly a dozen ways of making a moccasin-type shoe. The significant feature of the shoe is that the soft upper leather extends completely under the foot and the upper is joined on top of the vamp with a U-shaped piece by means of butt-stitched seams. No insole is required and in its simplest form no outsole is used. A single sole may be used and this is lockstitched to the upper. Often two soles are used on this type of shoe. (See figure 8.) In some types the moccasin construction is used for the top of the vamp but the remainder of the shoe is made by other conventional methods without the upper extending under the foot. Various types of sandals have a similar construction, but the cemented process previously described is generally used in the cut-out and sandal-type shoes available.

V. DISCUSSION OF CONSTRUCTION CLASSIFICATION

Classifying shoes by types of construction is difficult because of the multiplicity of types and the rapid growth in the manufacture of shoes having the soles attached with cellulose cement. In the July 3, 1937, issue of Hide and Leather Magazine, the Compo Shoe Machinery Corporation stated that the number of pairs of such shoes increased from 2¼ million in 1929 to 41 million in 1936. These shoes are made mostly in women's lines but production is starting in other lines as well. There is no denying the importance of cementing processes in shoe construction. The situation complicates simple classification systems in view of the fact that nearly all methods in existence before the cementing method made its appearance are used in combination with the cementing methods. The simplest example of this is the Goodyear-welt shoe. Ordinarily, the sole is attached to the upper part of the shoe by stitching through the outsole and welt. It may be stuck on with cement and the stitching eliminated. In this case it becomes a cemented welt and consequently another type of construction.

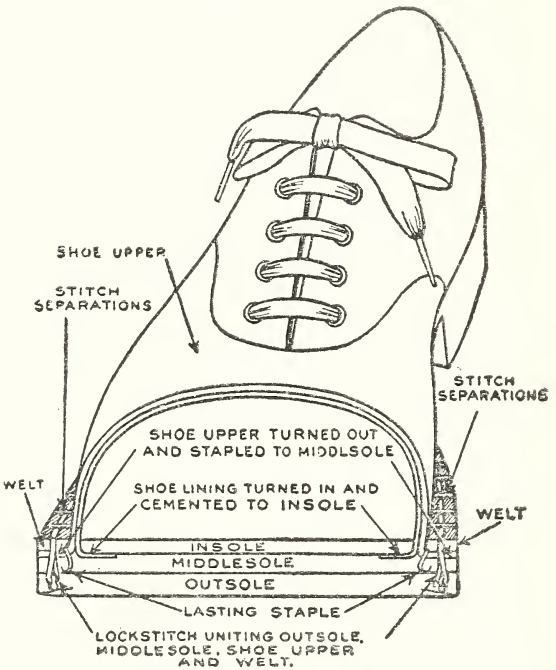

FIGURE 5.—*Construction of a stitchdown (three-sole) shoe.*

Strictly speaking, the real cemented shoe is the one where the upper is cement-lasted to the insole or its equivalent and the outsole is

attached to the upper with cement. However, it appears that many other types of construction are classified as being cemented. The justification for this seems to be that the outsole is attached with cement. Thus we have the Goodyear-welt, the McKay, and the Littleway types of construction which are lasted in accordance with the usual methods and then finished by attaching outsoles with cement. What actually occurs is that the cement takes the place of stitching in holding the outsole to the upper part of the shoe. There are other combinations where the upper is partially tack-lasted or staple-lasted with the remaining part lasted with latex cement and then finished by applying outsoles with cement. Still further there are such constructions as the Namrog welt and the Sbicca shoes with their variations.

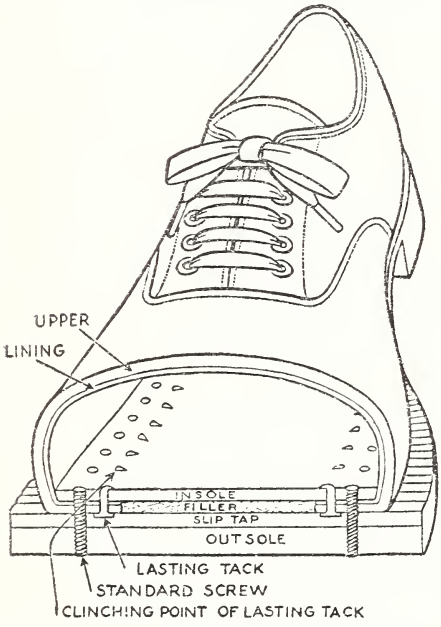

FIGURE 6.—*Construction of a nailed shoe.*

The simplest classification system which might be used for marking shoes is one similar to that used by the Bureau of the Census in compiling its manufacturing statistics. Such a classification might consist of the 8 class headings as follows: welt, McKay, Littleway, turn, stitchdown, nailed, cemented, and moccasin. If this classification should be adopted, it would first be necessary to classify more than 40 individual constructions under appropriate main headings in some such manner as previously indicated in this report. After this has been done, it is well to study the significance of the main headings in relation to the individual types under them. There are, for example, nine individual constructions listed under the main heading of welt construction. The point of similarity is that a welt is used in all constructions but the individual types in the class are quite different. This may be noted by comparing the Goodyear-welt and the Namrog-welt. Certainly the term welt would not convey to the consumer any such marked difference as exists between these 2 constructions. The same can be said for the stitchdown and cemented classes of construction. Therefore, it is believed that a single-word description of construction classes is not adequate in that it would not truly represent to the consumer the actual construction used. The information on construction would have to be given in more detail. This might require a label system, since the necessary information could not readily be marked on the shoe itself. Such descriptions would have to be worked out by competent individuals. An illustration of what is meant by this follows:

Simple Classification (Marked on Shoe):

Littleway

Supplemental information necessary on label:

Insole Upper staple-lasted Outsole lockstitched

There is further information regarding construction which may be of importance to the consumer and which is not indicated by single-word descriptions. In most cases nothing is said in construction descriptions regarding the manner of fabricating the upper, the counter, the toe cap, the lining, the heel, and the shank. It is not intended to include reference to materials for these parts, but are these parts not important items in construction?

A further point of interest to the consumer is whether or not the shoe is of a normal or corrective construction. It is said that there are 500 or more brands of corrective shoes made. Thus it would seem wise to have all such shoes marked with some distinctive term, such as orthopedic, to let the consumer know he is getting a shoe intended to correct some foot condition.

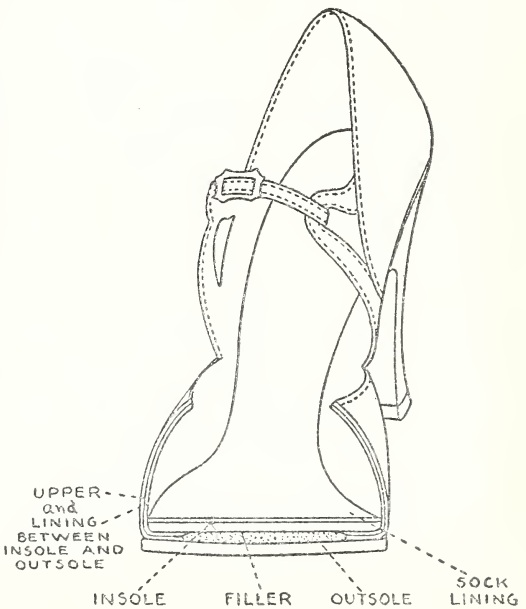

FIGURE 7.—*Construction of a cemented shoe.*

VI. CONSUMER VALUE OF CONSTRUCTION MARKING ON SHOES

In view of the many individual types of construction in use today, it seems that a limited single-word description would be of little value to the consumer. It is also doubtful whether even a detailed account

of the construction of the shoe would serve a useful purpose. Behind such descriptions some authoritative reference document would have to exist which represented the best opinions as to the merits of different constructions.

It is believed the consumer is primarily concerned with the performance of the shoe purchased with respect to such items as fit, appearance, flexibility, durability, water resistance, and ability to resist distortion and general breakdown under normal conditions of use. With the knowledge at hand at the present time, it does not appear that the mere marking of a construction type on the shoe will guarantee any degree of performance. If, for example, the main class of welted constructions is broken down, the term "Goodyear-welt" might be used to designate one of the welt types made. This is one of the oldest types of shoes made and represents that worn by the majority of men. Granting that the term "Goodyear-welt" would convey a definite construction idea to the average purchaser (a doubtful assumption), what then could be its significance with respect to the performance of the shoe, in view of the fact that a man's Goodyear-welt shoe may be purchased at a given time over a price range from $2.50 to $15.00. Outside of any traditional merits of this type of construction, the most the name would mean is that the cheapest and most expensive shoe would contain the same number and kinds of parts put together in the same manner. Much of the price difference must come about through the use of different grades of material and workmanship. This leads to the conclusion that standards of performance are needed more than anything else as a basis for a system of nomenclature which might be used for marking shoes for the benefit of the consumer.

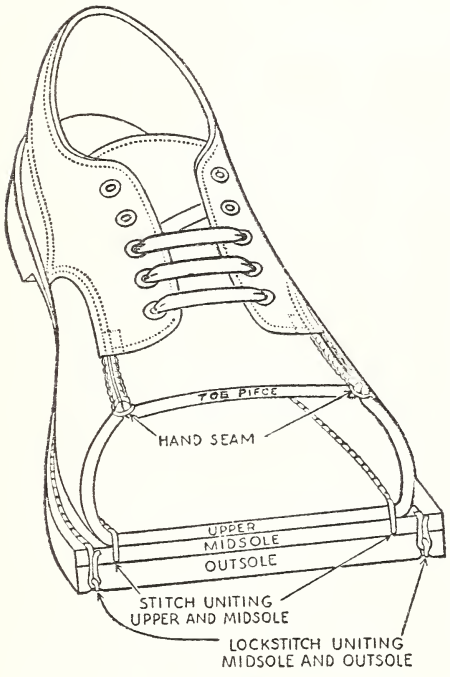

FIGURE 8.—*Construction of a moccasin shoe.*

An old argument in favor of the Goodyear-welt type of construction has been that it can be repaired readily. This is still true but, aside from the single-sole shoes, it is believed that modern methods permit the repair of other types with equal facility. Here again, however, the question of the quality of materials arises. A certain grade of a possibly less desirable construction might be repaired more readily than a Goodyear-welt made of low quality materials.

One gets the general feeling that highly competitive conditions and the mechanization of the industry bring about the many individual types of shoe construction and that these have not come from studies to determine which types of construction have the most utility.

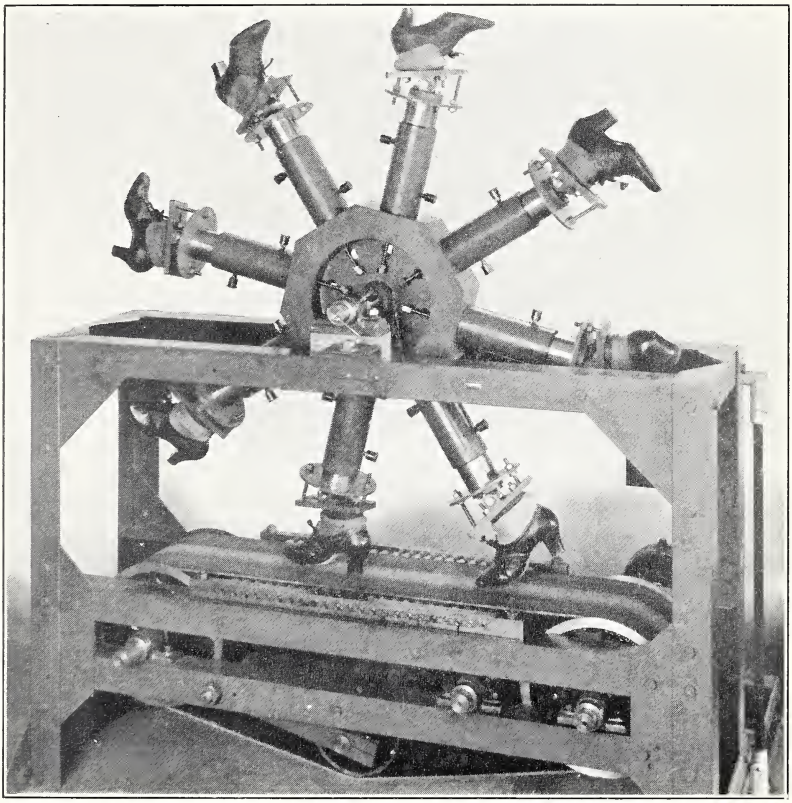

FIGURE 9.—Shoe-endurance machine designed and operated in the leather laboratory of the National Bureau of Standards.

VII. PERFORMANCE OF SHOES

There is a real lack of definite information on what the shoe, as a whole, will do in service. Performance, of course, is influenced by the use class, the type of construction, the quality of materials used, and the standards of workmanship used in manufacture. No doubt individual manufacturers have conducted service tests in great number and secured information of value to them. One procedure understood to be common when changes in construction or materials are being considered is to watch the percentage of shoes returned for adjustment. If this falls below a predetermined percentage, the innovation is considered successful.

The behavior of shoes in service apparently offers a virgin field for research, especially in relation to what can be done in the laboratory. A start on work of this kind has been made at the National Bureau of Standards as a result of a request from the General Federation of Women's Clubs for information which would be of assistance in drafting standards for women's leather shoes. Rather than prepare specifications according to construction and material standards, a machine was designed and built for studying the behavior of shoes in the laboratory.

The first work consisted in testing shoes for the purpose of finding out whether the type of construction influenced the ability of the shoe to hold its shape and resist general breakdown. Welt, cement, McKay, and Littleway constructions were run on the apparatus until 1,000,000 steps had been taken by each shoe. No general breakdown or serious change in shape occurred in any shoe. The same materials and the same standards of workmanship were used in making all of the shoes. Thus shoes of four different constructions stood up equally well while making 1,000,000 steps under normal conditions of load and flexure.

Tests on shoes of lower grade than those used in the first series have been made and breakdown of essential parts of the shoes occurred after 35,000 steps. The failure was caused mainly by the nature of the materials used.

VIII. SUMMARY

1. Forty individual types of shoe construction are described briefly, and their classification under 8 main classes is discussed. These are welt; McKay; Littleway; turn; stitchdown; nailed; cemented; and moccasin.

2. It is believed that these single-word terms would not be sufficient for marking shoes since the individual constructions vary greatly for any one class. Hence little information of actual value would be given as to the real method of construction used.

3. In order to be informative, the method of construction would have to be described in some detail and information regarding the upper part of the shoe included. This would require a label or tag containing the desired wording.

4. Detailed information regarding the method of construction would be of doubtful value to the user because of the many grades of shoes it is possible to make with the same method of construction.

5. Shoes of four different constructions, made with the same quality of materials and the same standards of workmanship, stood up

equally well when run on a laboratory apparatus for 1,000,000 steps under normal conditions of load and flexure.

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