

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

Letter
Circular
LC921

ERH:EMK
7.4

October 11, 1948

Leather Gloves: General Information

By Elizabeth R. Hosterman
and Robert B. Hobbs

	Page
CONTENTS	
I. Introduction	1
II. Kinds of skins used for glove leather	3
III. Tanning of glove leather	6
IV. Construction of gloves	10
V. Care of gloves	13
VI. Glove sizes	15
VII. Bibliography	16

I. INTRODUCTION

A pair of gloves is a part of the wardrobe of most people in the temperate and frigid zones of the earth. Work gloves are used to protect the hands from blisters or other mechanical injury, from excessive heat or cold, or from chemicals. Street and sports gloves ward against cold weather chiefly, but may offer some mechanical protection. Dress gloves, however, serve primarily to add a desirable detail to a fashionable outfit, the protection to the hand being incidental.

Animal skins were probably the first coverings for the hand used by prehistoric man. The popularity of leather for gloves today is evidenced by the fact that forty million pairs of all-leather gloves are manufactured in this country annually, and many millions more consist of leather used with other materials.

Among the properties required of any glove material may be flexibility, resilience, resistance to scuffing and tearing, high rate of transpiration of water vapor (perspiration), resistance to liquid water, insulation against heat or cold, noninterference with tactual sensation, and pleasing appearance. Different leathers can be prepared to have widely varied combinations of these properties, ranging from the light, flexible ladies' dress gloves, to heavy work gloves.

Gloves in various forms have been used since the beginning of recorded time. Archaeologists have discovered evidence that the Egyptian pharaoh, Tutankhamen, wore them in the fourteenth century B. C., and gloves are mentioned in the Old Testament Books of Ruth and of the Psalms. In Sweden there have been unearthed leather gauntlet gloves used by warriors in a great battle in the year 1361. They consisted of no less than 158 pieces, cut and sewn together in a very complicated manner. Contrast these with a modern glove made of eight pieces only: the palm and back as one, the thumb, three quirks and three fourchettes. (Described on page 11). Yet as many as 86 operations are required in making a good glove, and 100 operators may handle the article in its various stages of manufacture.

Although gloves are said to have been introduced into England by the Romans, their adoption did not proceed rapidly until after the Norman conquest, so that it was not until the thirteenth century that they came into general use. Limited at first to the clergy and nobility, gloves had a peculiar symbolic significance as tokens of faith or good intention. A monarch unable to enter negotiations personally might send his glove by an emissary as a sign of greeting and good faith, and gloves were exchanged between parties solemnizing a contract. The glove was used as a challenge or pledge of honor in knightly combat, and was employed in rituals of investiture for nobles and dignitaries of the Church.

The manufacture of gloves developed simultaneously in all the major Western European nations, but French glove makers were particularly noted for fine dress gloves. These were sometimes highly ornamented with silks, embroidery, jewelry, and gold. Catherine de Medici encouraged the style of perfumed gloves. An indication of this French heritage persists to this day in the use of the "French" rule in measuring dimensions before cutting dress gloves.

The principal center for glove manufacturing in the United States is in Fulton County, New York, especially in the towns of Johnstown and Gloversville. Other important centers are in Boston and New York City in the East, Chicago and Milwaukee in the Midwest, and San Francisco and Los Angeles on the Pacific Coast.

II. KINDS OF SKINS USED FOR GLOVE LEATHER

Leathers for dress or street gloves may be divided into two main classes, grain finish and velvet or suede finish. The grain side of the skin is the hair side, and grain finished leather usually shows a well-defined pattern of hair follicles, sometimes best observed under a magnifying glass.

The chief types of grain-finish glove leathers are calfskin, cape, cabretta, deer, dog, goat, horse, kid, lamb, and pig. The term kid has been applied indiscriminately to any light-weight grain-finish glove leather. A better term is "glace", used for a smooth grain-finish leather from a skin of the sheep family, as compared to pig, dog, and other leathers.

Calfskin is made from the skins of young calves, particularly of American, and before the war, of Polish, Ukrainian, or Byelo-russian origin. It has a tight, uniform grain, a smooth and glossy appearance, and a supple, mellow, rather heavy and full feel. Its chief use is for men's gloves and for tailored gloves for women. It is usually chrome tanned and is washable.

Capeskin, named for its port of embarkation, Cape Town, is the skin of a South African haired sheep. The leather has a tight, close grain and is sturdy and pliable. It is distinguished by a very strong grain, which enables it to be split to light weights without serious loss of strength. Its tight grain makes it possible to impart a high luster, and these properties make it a favorite for the more formal types of street gloves.

Cabretta comes from the skin of a hair sheep found in South America, especially Brazil. Although similar to capeskin, it is somewhat softer and looser in texture, and scuffs more easily. Cabretta has increased rapidly in popularity in recent years.

Deer skins for grain-finish leathers usually come from China and Central and South America. Extremely durable and with a stout, plump, though flexible feel, deer skin is suitable for men's street and sport gloves.

Dog skins are obtained from many countries in limited supply. They have a rough, coarse, prominent grain, but are quite durable, and are therefore favored for men's sport gloves. They are usually chrome-tanned and dip-dyed.

Goat skins are obtained from Spain, South America, South Africa, and India. Through a special process of chrome tannage, this naturally tough skin is made pliable, soft, and attractive. The pebbled grain, desirable for sport gloves, can be given a high gloss.

Horse hide is derived from domestic and imported sources. It is usually chrome-tanned, and the better hides, when split to lighter weights, have gained acceptance for street gloves. Its great strength and durability make it very useful for work gloves also, the less perfect hides being used for this purpose.

Kid leathers are made from the skins of young goats and are usually imported from Europe. The term, kid, applies to skins from milk-fed animals; after they are put to pasture, they are no longer considered kid. Kid is a very fine leather, with close, tight grain, and capable of taking a very pleasing finish. It has good elasticity, and high strength and durability for its weight.

Lamb skins for glove leather also come chiefly from Europe. The leather is slightly coarser in grain than kid, less durable, and less elastic.

Wool Sheep skins are also used for gloves, particularly skins from those animals allowed to roam the range, and having inferior wool, as in Russia, Turkey, Bulgaria, and Spain. Sheep highly bred for wool or tender meat have inferior skin for leather, as it is weak and of a loose, open structure, and has a coarser appearance and less durability than leather from hair sheep.

Pig glove leather, as the term is commonly used in the market, comes from a wild hog (peccary) or water rodent (carpincho) from Central and South America. Skins of domesticated hogs appear in very small quantities. They are used particularly in gloves imported from England. All three

are similar in appearance, having a coarse pebbled grain, marked with groups of prominent bristle holes. Scratches, caused by the wild animal coming in contact with thorns, may appear on the finished leather, but have negligible effect on the durability and are not considered as lessening the style appeal. The leather is given a chrome washable tannage and is usually finished in natural cream, cork, or similar colors. Pigskin is particularly appropriate for sports gloves.

The principal velvet or suede finish glove leathers are buckskin, chamois, degrain, doeskin, flesher, mocha, reindeer, and suede.

Buckskin usually consists of scratched deer skins imported from China and from Central and South America. The supply of domestic deerskins is very limited. Usually the grain is skived off, and a velvet finish given to this side. If deeply scratched, the flesh side may be finished. Clay dyes are brushed on the surface, and oil tannage is generally used. Buckskin is characterized by porosity, softness, and warmth, and is suitable for street and sports wear.

Chamois gloves were originally made from the skins of the European antelope. The animal is now so nearly extinct that this type of chamois is rare. The glove leather bearing this name is made from lamb or sheep skin from which the grain is split off. Oil tannage creates a washable, porous, supple leather, creamy yellow in color. It is valued for tailored gloves for women, golf gloves, and men's street gloves.

Degrain is a lamb or sheep skin that has been chrome tanned and finished on the flesh side.

Doeskin, as the name implies, originally came from the female deer, but because of the limited supply of these skins, the term is commonly applied to leathers made from lamb skin. The grain surface is removed and a velvety nap finish is produced by an emery wheel. The leather is formaldehyde tanned, and readily takes desired fashion colors. It is light in weight, washable, very porous and absorbent. Consequently, it is suitable for women's dress wear in summer as well as in winter.

Flesher is the coarse flesh split of lamb or sheep skin. It is alum tanned and dip-dyed, and used for low priced gloves.

Mocha glove leather (named for the Arabian port which is a principal collection market) is made from Asian or African hair sheep. The intense heat of the climate in the Red Sea area from whence they come makes curing difficult;

the surface may appear cured before the center is thoroughly dry. As a result, putrefaction may occur during shipment, and large holes appear when the skin is limed. In tanning, the hair side is friezed off, giving the appearance of suede or chamois. Most mocha skins, perhaps 80 per cent, are now given a preliminary tannage with alum, followed by chrome tannage, so that the gloves are washable. Mocha is used chiefly for men's gloves for street and semi-formal wear, and for women's tailored gloves.

Reindeer hides for gloves have come principally from the U.S.S.R. They are usually oil-tanned and dip-dyed, and are washable. In medium and heavy weights, reindeer is used for men's street gloves.

The term "suede" is a rather loose designation sometimes applied to flesh-finished kid and lamb, either imported or domestic. In this sense it is correlative with "glacé". It should properly be used only to describe a suede or velvet finish, rather than leather from a certain kind of animal.

III. TANNING OF GLOVE LEATHERS

The chief methods used for tanning glove leathers in this country are those using chromium compounds, oil, formaldehyde, alum, and synthetic tannins. Because so many skins are imported from less industrially developed areas of the world, where they are poorly cured, they must be handled with extreme care in the tannery. This necessitates considerably more hand work. It is also customary to sort and grade the skins at more than one step through the tannery, especially after unhairing, so that only those skins capable of producing the finest leathers will be given the expensive handling necessary to yield a product that will command top prices.

The raw skins are received at the tannery in bales or casks. They have usually been cured in some manner to afford temporary preservation until they can be tanned. This curing is usually effected by soaking in strong brine, or by scattering salt over the dried skins. Some skins may be sprinkled with naphthalene to repel insects. In some parts of the world where salt is scarce or expensive, the skins are merely well dried in the sun before shipping.

Several preliminary operations on the skins are necessary before the actual tanning takes place. These are for the purpose of removing hair or wool, fat and flesh, sweat glands, and undesired proteins in the skin, and to prepare the skin

in such a condition that it will react readily with tanning materials and dyes. The sequence of operations is not the same in all tanneries nor for all kinds of skins, although the principles involved are the same.

The first step in preparing skins for tannage is invariably soaking. This is for the purpose of removing loose dirt, salt, or dried blood, and softening the dry, hard skins so that they can be handled easily and will absorb chemicals in subsequent treatments. Soaking is usually carried out with soft, clear water in large revolving drums or in paddle vats, so that the skins can be tumbled or agitated. If the skins are very hard and dry, especially those not salted, a small amount of soda ash may be added to the soak water to hasten the process. Modern synthetic detergents and wetting agents are also proving useful for this purpose, as they hasten the process of wetting the skins and decrease the amount of mechanical action necessary.

The next step is the removal of the hair. A common method is to apply a paste of slaked lime containing red arsenic or sodium sulfide to the flesh side of the skin. The chemicals soak through to the hair roots, and decompose the material holding the hair to the skin. After a few hours of this treatment, the hair is sufficiently loosened that it can readily be removed, either by hand scraping with a dull knife, or by passing through machine-driven rollers with dull spiral blades. Unhairing is sometimes done by soaking the entire skin in a solution of slaked lime, usually containing a "sharpener" such as red arsenic. This may be continued just long enough to loosen the hair for removal by mechanical action, or the skin may be kept in such a solution until the hair is mostly dissolved.

After removing the hair, the skins are usually soaked for a long time in a solution of slaked lime. In this solution for a period of one to four weeks, sweat glands, hair roots, and other useless protein matters are loosened or dissolved, and the skin is "plumped" or swollen to perhaps twice its original thickness. It acquires a tough, rubbery consistency, which protects it from damage in the next operation.

The following step, known as fleshing, consists in passing the skin through rollers equipped with spiral blades, which cut off any fat or loose flesh that may adhere to the flesh side of the skin. Often this is followed by hand fleshing, done by a skilled workman with a curved, two-handled knife, who places the skin over a wooden beam and cuts off any remaining

fat or flesh and irregular, useless, edge portions of the skin. He may also "scud" the skin, that is, scrape the grain side in such a manner as to squeeze out hair roots, sweat glands, and remove dirt.

After fleshing, the skins pass through one of several alternative processes designed to neutralize and remove the lime, to dissolve more of the useless protein in the skins, and to cause the skin to "fall", that is, to lose its tough, rubbery, swollen quality and become soft, very flexible, and ready for the action of the tanning chemicals. One of these alternative processes is deliming and "bating", using a solution containing ammonium chloride or other deliming salt, and a pancreatic enzyme. Or they may be subjected to "drenching", using a fermenting suspension of cereal flour or bran in water, or they may be drummed with a solution of common salt and sulfuric acid. In any case, this step lasts only a few hours.

Some very greasy skins need an additional degreasing step to remove excess fat from between the fibers of the skin, so as to make them readily accessible to the tanning chemicals. This can be done either by squeezing out the grease by a hydraulic press, or by dissolving it in kerosene, and then rinsing away the excess kerosene.

The skins are now ready for tannage. At this stage they are said to be "in the white", or called "white" skins or hides.

In chrome tanning, the skins are placed in a rotating drum with a solution of a chromium salt. The drum is revolved for several hours, or until the skins become bluish-green all the way through. Then follows a drumming in a dilute soda solution. The raw hide has now been converted into leather, but it is not yet finished leather, for in this condition it would dry out hard and stiff. It is now treated with a "fat-liquor", an emulsion containing oil, which lubricates the fibers so that they can move against each other easily, thus giving the leather flexibility. The tanned skins are now dried by allowing them to hang in a heated room or tunnel.

The dried skins are still somewhat stiff compared to the soft, flexible leather that we know in gloves. Large skins or hides may be softened by a workman using a machine which flexes the skin between a roller and blunt blades. The smaller skins for most dress gloves go through the process known as "knee staking", carried out by a highly skilled operator. The "stake" is a dull curved blade, fixed at the top of a post at

convenient working height, about three feet. The worker grasps the skin in both hands, flesh side toward the blade, and works it back and forth in all directions, applying pressure with the bare knee against the skin to force it against the blade. The skin loses all harshness and becomes very soft and flexible.

Oil tannage is used to tan buckskin and chamois. The skins are put into a kneading machine which constantly agitates them in a cold bath. Care must be taken to avoid overheating. The skins are alternately bathed in a cool water bath and heated in a cod oil kneading process for five days. Gradually heat is generated by the oil and the kneading, and a chemical change, oxidation, takes place. The oily skins are allowed to dry for a few days and then soaked in soda ash solution to remove excess oil. An emulsion of soda ash, oil, and water is formed, called fat-liquor. The skins are put into scouring stocks and kneaded in clear water to remove oil and then dried. Buckskins are usually bleached. First they are dampened and buffed by an emery wheel on both sides. They are again soaked in a solution of fat-liquor and water and bleached outdoors for a period of four days to two weeks. The buckskins are softened and finished by staking. Both sides of the leather are then buffed on the emery wheel. Chamois is treated much like buckskin and is finished in the natural yellow of the oil tan. Doeskin is prepared for tannage like buckskin. Instead of oil, a special white synthetic grease is drummed into the skins.

Alum tannage is applied mainly to produce mocha skins and domestic suede. The skins are placed in drums or vats in which a paste of alum powder, egg yolks, flour, salt, and water has been mixed. This paste sticks to the skins which are dried in the crust. They remain in this state six weeks to six months, and then the uncombined chemicals are washed out. Staking and buffing give the leather a proper finish. Two types of finish are used in glove making, grain finish and nap finish. Grain finish is a smooth, shiny finish made on the top side of the skin, by buffing or polishing on plush wheels. The de-grained or nap finish is obtained by buffing on both sides on emery or carborundum wheels. The skins are soaked in clear water to remove excess alum and flour, and are then immersed in a drum containing the dye bath, or are brush dyed.

Formaldehyde and synthetic tanning materials are used to a lesser extent, often in combination with the oil or mineral tannages. The processes are very similar to those already described. A new mineral tanning agent that has become increasingly popular in recent years is zirconium. Zirconium salts are used in a manner similar to chromium. The resulting leather is white throughout, and readily takes dyes of all colors.

The skins are usually sorted and graded once more before dyeing, to select those most suitable for certain colors and certain types of gloves.

In brush dyeing the dye is brushed by hand upon the surface of each skin. In the best grades of glove leathers, such as fine kid or suede, the dye does not penetrate the leathers, and the inside of the glove remains white.

In dip dyeing, the leathers are dipped into the dye which penetrates the entire skin. The vats sometimes hold as much as one hundred and twenty dozen skins. Even when this method is used, there is always a color variation, as the skins, coming from different animals, do not react uniformly with the dye.

Dyeing is a difficult process, requiring an expert knowledge of the reactions of skins with different coloring matters to produce uniform shades. Particularly when a new fashion color is wanted, considerable experimentation with trial lots of skins and different dye formulations may be required to get a product having the exact tint desired, and with a uniform intensity of color.

IV. CONSTRUCTION OF GLOVES

The leather is prepared for glove manufacture by several additional operations. In staking, the leather is stretched to exactly the degree that permits it to retain the proper amount of resiliency and pliability. Machine staking is done on heavy leathers. Hand staking is done on light-weight leathers. When the leather has been stretched in this manner, it is soft and pliable and on the way to make a perfect-fitting glove. Doling, the next operation, is the process of shaving the leathers. Any excess weight or thickness is pared off by fine knives on rollers. Wheeling is a process similar to doling except that it is done by hand. If the wheel is of emery, the finish will be a fine nap. If the wheel is of plush, the resulting finish is a high, glossy one.

The main operations in making dress or street gloves are sorting and taxing the leather, cutting the trunk, slitting the gloves, silking, seaming and binding, making the cuff, and laying off.

The sorting of skins is done by experts who look for defects and estimate the grade and weight of the skins. Men who have had long experience in cutting, "tax" the skins, that is, judge how many pairs of gloves can be cut from a certain number of skins. Allowance is made for imperfections or holes which the cutter will have to avoid in making the trunk. The number and size of the gloves to be cut are marked on a slip and sent to the cutting room.

In order to explain the three methods of cutting, it is necessary to define a trunk as the rough, oblong piece of leather which corresponds to the correct size of the glove with just the right amount of stretch across and practically none on the length. The smaller pieces of the glove are called fourchettes, quirks, and thumbs. Fourchettes are the narrow strips of leather on the inside of the glove fingers. Quirks are the gussets set in at the base of the thumb and often at the base of the fingers also.

The three universal methods of glove cutting are table cutting, pattern cutting, and block cutting. The best and most expensive method of cutting gloves from leather is known as table cutting. Table cutting is explained as "the name applied to the scientific art of so fabricating the cut of the trunks for a leather glove, with shears and rule, by expert and proven measurements as to insure an absolute fit for a certain specified hand size." Table cutters are the aristocrats of the industry. Their ability to make fine gloves comes from their knowledge and manipulation of leathers, their judgment as to the resiliency and strength of each skin that comes to their hand. Each piece of leather must have been properly stretched by hand to have the proper amount of "give" crosswise and none lengthwise.

Another method of cutting is known as the pattern-cutting or pulled-down method. This is an adaptation of table cutting, by which the whole skin is considered as a unit and the trunk, after being cut, is pulled down to fit the pattern. This is not as exact as the first method, but is less expensive.

The third type, block cutting, is generally used for the heavier leathers that cannot readily be cut by hand. The gloves are die cut directly from the skins without the inter-

mediate step of cutting a trunk. Singly or in piles the whole pieces of leather are placed under a machine-driven, sharp die which stamps out the pattern. Thumbs, fourchettes, and quirks are also cut by the machine die in this process.

Each pair of trunks is put back to back, and the bundle of trunks goes to the slitter who cuts the trunk into the shape of the glove. The slitter takes a group of six or eight trunks and places them on a steel pattern. The pattern is forced against a block and cuts through the trunks. The main part of the glove, including the fingers, is cut in this one operation.

Silking or pointing is the next operation. This forms the three rows of stitching or embroidery seen on the back of most gloves. It usually requires at least two operations on different machines. There are many types of stitching possible for silking, and it depends upon the person employed as stylist, how they are to be executed. In some cases a ridge of leather is raised by stitching it in a certain way. This ridge can either be straight or waved. Two or more ridges may be created or the pointing may be done by machine embroidery. When stitching is completed, the ends are tied on the under side.

In sewing the seams of the glove, the thumbs are inserted, the fourchettes and quirks sewn in place, and the fingers and sides closed. The most important different kinds of seams are: prixseam, gauge seam, full pique, inseam, overseam, saddlestitch, triplestitch, tystitch, and whipstitch.

Prixseam or P.X.M. is an outseam stitched on a flat machine by a needle which moves horizontally instead of vertically. The seam is very straight and even, and the raw edges show.

The gauge seam, made on a flat bed machine, is similar to the prixseam, but not quite so fine and even.

Full pique (P.K.) or lapseam is a seam in which one edge of the leather is lapped over the other so that one raw edge can be seen on the outside of the glove. The stitching must be done on the very edge and hence this is a difficult seam to make, especially on the finger closings. Half pique is similar in appearance to full pique but is quicker and less expensive.

In the inseam type of stitching, the edges are turned in and stitched on the wrong side. No raw edges are visible. The seam is used on cheaper grades of leather gloves.

The overseam is made by placing the two edges of the leather together and sewing them over and over. It is also referred to as the "round seam" and the "cable seam."

The saddle stitch seam is made like a gauge seam. Heavier thread is used, and it is distinctive for goatskin and pigskin gloves.

Triple stitch is a seam made on a special machine, which takes two stitches forward and one back to lock the stitch. If the seam is cut, the stitches will not rip as in ordinary seams.

The tystitch is a recently invented machine stitch which simulates a hand sewn stitch.

In the whipstitch the cut edges are placed together as in the prixseam and an over stitch is sewn by hand with coarse thread. This is a popular sports type stitching.

Cuffs are made separately and applied as a final sewing operation. The cuffs are die-cut by hand as are any small pieces of contrasting leather to be used as trimming. When the glove has no cuff, the binding of self or contrasting leather is applied in an operation called hemming. Buttonholes, if needed, are made at this time as well.

The gloves are completely stitched, but they are still quite shapeless. They are rolled in damp cloths until the moisture has penetrated into the leather. Then they go through what is known as the "laying off" operation, i.e., a pressing to tailor the glove to perfect size and shape. They are fitted on steam-heated brass hands which shape the gloves. Some gloves are laid off on special forms that hold in the fourchettes to give a flat effect to the glove. The gloves are inspected again. (There are about 95 inspections from the raw-leather state to the finished glove). Gloves with a nap are brushed again and glaces are polished on brush rollers.

V. THE CARE OF GLOVES

The durability and appearance of leather depend largely on the care which is given to it. Since dress glove leather is thin and soft, it is likely to be abused by rough or

careless handling. The suggestions given below, if followed, will add to the life of the glove.

In putting on a tightly-fitting dress glove, the wrist should be turned back, and the fingers of the glove should be worked on simultaneously with a sliding motion. Afterward, the thumb is slipped on and the wrist drawn into place. It is always well to try the gloves on slowly the first time to make sure of a good fit.

Dress gloves should always be removed by drawing them off backwards or wrong side out by the wrist. Never pull a glove off by the cuff, which is for decoration only. Then they should be turned and drawn back into shape while still moist, folded carefully and laid flat with palms together in a box or drawer free from dust. White and light-colored gloves should be further protected by wrapping them in tissue paper. If the gloves are damp from perspiration, they should be allowed to dry before putting them away. The natural oil of the hands will help keep the gloves in good condition. If the gloves are unworn for a long time, they will become dry and crack.

Gloves for business, driving, and sports should fit more loosely than dress gloves. When buying gloves that are not to be worn for a while, the customer should try them on occasionally so that the leather and seams may be stretched to fit the hand while they are supple. When gloves become wet with perspiration or rain, they should be dried in the air to prevent mildew and spotting. Gloves should never be rolled into a wad or crumpled. They should be washed or dry cleaned before they become too soiled. Gloves which should be dry cleaned are kid, lamb (suede or glace finish), buckskin (in colors), and mocha. Gloves which are washable are cape, chamois, doeskin, buckskin (white), pigskin, calfskin, goatskin, grain deerskin, and mocha and suede which are tanned washable.

In washing gloves, first of all, make sure that the gloves were sold as washable. However, there are some approved detergents which are safe to use on "unwashable" gloves. A glove should never be washed which has been previously dry-cleaned. Gloves should be washed before they become badly soiled, in lukewarm to cool mild soap suds or in special cleaners. These suds should be changed until the gloves are clean. All leathers except chamois and doeskin are washed on the hands. Leather gloves such as suede, pigskin, and kid should be rinsed with clear, lukewarm water. Chamois and

doeskin gloves are rinsed in clean soap suds. The soapy lather drying in the gloves renders them soft and pliable. The gloves should not be wrung or dried near a radiator. The best way to remove the excess moisture is to blot them in a Turkish towel. Blow into the gloves, shape them, and place on a towel or a wooden board to dry. When they are fully dry, the gloves can be softened by rubbing them between moistened hands. Then the gloves can be fitted to the hands.

A special glove-washing material, which was developed through extensive research for the National Association of Leather Glove Manufacturers, and recommended by them, is known as "G.A. 50." This detergent, which is used in a water solution, is obtainable, with directions for use, at retail glove dealers.

VI. GLOVE SIZES

It is almost impossible to find two hands exactly alike, and therefore it is necessary to use for gloves materials with some pliability and elasticity. If the glove is correctly fitted as well as possible in the first place, it will accommodate itself to the exact shape of the hand.

Usually women's sizes run from 5-1/2 to 8 in one-quarter sizes; men's sizes run from 7 to 8-1/2 in quarter sizes and thence to 10 in half sizes. Men's gloves are sometimes measured by letters from double A to E. Boys' and girls' sizes are from 1 to 7.

Some retailers use a mechanical glove fitting machine on their counters to measure the customer's hand correctly. This machine aids in determining the correct size, and eliminates much unnecessary handling of the gloves. The right hand is generally measured first, as it is larger, unless the purchaser is left-handed. If gloves fit too tightly, circulation of the blood will be impeded, resulting in cold hands. Gloves for active use, as driving and sports, should fit more loosely than dress gloves. The wearer should be able to make a fist with adequate room for the knuckles.

If the circumference of the hand is measured with a tape, it will usually be found that the proper size is one size smaller than the indicated measurement. That is, if the hand measures 7 inches around the palm, size 6-3/4 will probably be correct. Compare the width of the glove with the clenched fist, and the length of the middle finger of the glove with the middle finger of the hand.

VII. BIBLIOGRAPHY

1. "Practical Glove Making." Isabel M. Edwards
I. Pitman & Son, Ltd., New York, N. Y., (1929)
2. "Love of a Glove." C. Cody Collins.
Fairchild Publishing Co., New York, N. Y., (1947)
3. "Leather Goods and Gloves." Helen Mary Lehmann.
Ronald Press Co., New York, N. Y., (1922)
4. "Gloves, Past and Present." Willard M. Smith.
Sherwood Press, New York, N. Y., (1917)
5. "Apparel Accessories." Karen R. Gillespie.
New York University, 100 Washington Square,
New York, N. Y., (1945)
6. "Glove Life." National Association of Leather Glove
Manufacturers, Gloversville, N. Y., (1948)
7. "The Art of Glove Making." National Association of Leather
Glove Manufacturers, Gloversville, N. Y., (1927)