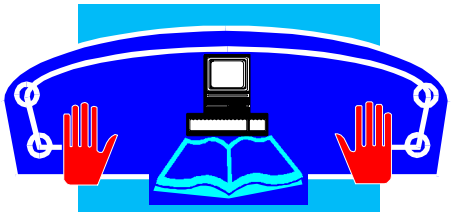

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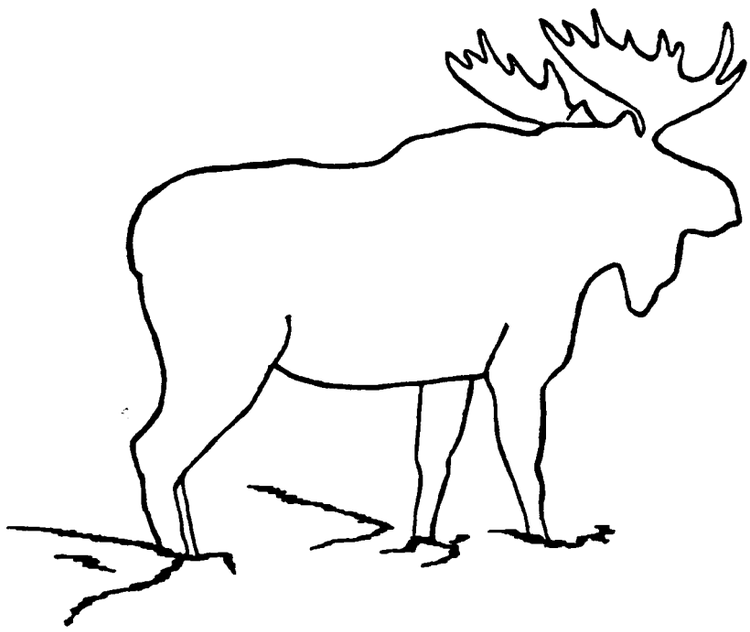

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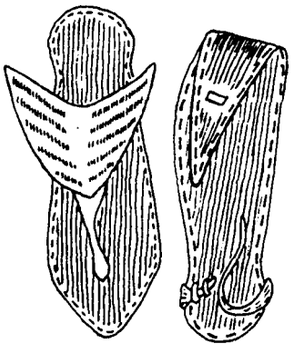
HISTORY OF LEATHERCRAFT

For us to trace the history of leathercraft it is necessary to go back many thousands of years to the time when primitive man first made leather. Up until this time he had been wearing animal skins and furs, which could not be called leather, because they were not tanned or treated in any way. Leather is the skin of an animal which has been preserved from decay and made pliable (or flexible) by tanning .

In ancient times the skins were used in their raw state, without preserving. Gradually simple methods of preserving or curing the skins were discovered. The earliest of these was a tanning process using the oils (fat and brains) of the animals from which skins came. An oil tanning process is still used today for special purpose leathers such as chamois leather. The Hebrews discovered a method of tanning leather using oak bark. This method involved soaking the skins in a solution of water and, oak bark for 3 to 6 months. Bark tanning is still used extensively today. At the end of the 19th century a much faster method of tanning using chromium salts was discovered in America.

As time went on man began to improve the quality of his leather and to use it, not only for clothes, but for blankets, tools and weapons. In the Bronze Age (2000 - 800 B.C.) it was discovered that Alum and Salt were excellent tanning materials. This method was perfected by the Remans who with this "ALUTA" leather reached a high standard of leathercraftsmanship, making such things as boots, chairs, sandals, animal harness and even money.

The Egyptians used leather and valued it highly, considering it worthy of tribute to their kings and gods. Many articles have been found preserved in the Egyptian Pyramids. Thus the Egyptians were skilled in the manufacture of



leather from animal skins over 3000 years ago. They used skins from the ox, goat, horse, sheep, lion and leopard, for shoes, ankle straps, helmets, shields, water bottles, writing materials and furniture coverings.

The Britons also used leather, though they knew little of the methods of preserving skins as used by the Egyptians, Greeks and Remans. They simply cleaned and dried them before use. Clothes, shoes, armour, saddlery, flasks and many household articles were made from these dried skins. By the year 330 B.C. the Britons had learned to tan the skins instead of using them in the raw state.

Roman soldier's boot

Embossing, or the pressing of a pattern into the surface of the leather, reached a high degree of excellence in Britain in the Middle Ages, even using untanned skins. After the discovery of tanning methods, leather succeeded furs for clothing in Britain and then Northern Europe, as it was lighter and less bulky.

The Asiatics were famous leather craftsmen, excelling in beautiful artistic leather articles. They did not use leather for domestic articles, having pottery for these, so they specialized in shoes, harness for animals and carrying bags.

The Indian people throughout North America developed great skill in the use of leathers. They used leather for clothing, footwear, bedding, shelter and many other purposes. The Navahos were especially noted for their decoration of leathers. Likewise the Eskimo people became adept in their use of leathers, particularly those made from seal, walrus, caribou and musk-ox. The umiak, kayak, anorak and kamik are fine examples of their skills using skins with only the simplest tanning methods.

The invading and warlike Remans spread their knowledge of tanning and leathercraftsmanship all over the Mediterranean. The Arabs in Northern Africa

benefited from this knowledge and when they crossed the Straits of Gibraltar and invaded Spain in the 8th century, they started many outstanding leathercraft centres, which specialized in saddlery and harness making. The famous leathers Cordovan and Morocco are reminders of their skill.

In the Middle Ages, few advances were made in leathercraftsmanship except for the improvements in embossing leather (especially in England).

A big change followed the Industrial Revolution. It was then that leather tanning changed from a small local handicraft to a big industry based on scientific methods and the use of machines. The leathercraftsman, who previously had done much tedious manual labour was also being replaced by the machines.

Today we find thousands of people engaged in the leather industry, but very few of these could be called leathercraftsmen. Most are leatherworkers. These are people employed in factories making portions of an article. For example, a man might be employed to stitch footballs, or as a garment cutter, a polisher, to fit heels to shoes, or to sort and grade leather.

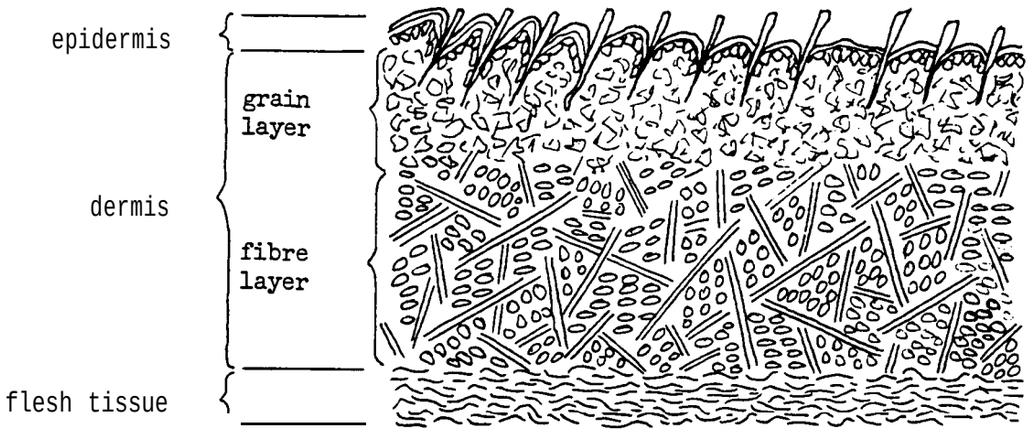
On the other hand a leathercraftsman has developed the special skill to select his leather, construct, decorate and finish leather articles. In this group could be classed the fancy saddle or whip maker, the surgical bootmaker and the home leathercraftsman.

In our modern times leather is used by all peoples for all the uses previously stated. Although, in some cases plastics are doing the same job as leather did, it may never be replaced, for no synthetic material yet produced has equalled the properties of flexibility, durability and porosity. The main use of leather is now in footwear manufacture, other important uses are for baggage and saddlery manufacture.

The Structure of Leather

If you were to examine the cross section of an untanned skin or hide

under a microscope you would notice that there are 3 distinct layers as shown below.



These layers are -

1. Epidermis - This is the thin outer layer of cells, which together with the hair roots is removed in the preparation for tanning. It is removed by chemical action and as the epidermis attaches the hair or wool to the skin its destruction facilitates the dehairing process which follows.
2. Dermis - This is the middle of the cross section of the skin and is the part which is made into leather. The Dermis itself consists of two very distinct layers -

   (a) Grain

   (b) Corium (or fibre layer).

   The grain layer in which the hair roots are embedded, is responsible for the different "grain" markings on different leathers, each animal having its own particular pattern. It is the grain layer of the dermis which becomes the top (or grain) surface of the finished leather.

The corium (or fibre layer of the dermis forms the main bulk of the finished leather and is composed mainly of bundles of fibres containing an organic substance known as collagen. The collagen, which reacts with the tanning agents, turns the dermis into leather. It is the vast numbers of tiny interlaced fibres held together by a connective tissue containing a protein called elastin, which gives leather its strength and flexibility while leaving it sufficiently porous to permit the passage of air and moisture.

3. Flesh or Adipose Tissue - The flesh tissue, which joins the dermis (or corium) to the carcase is removed in the fleshing process prior to the actual tanning of the skin.

While the hides or skins of all animals consist of the epidermis, dermis, and flesh layers, they differ greatly between species. An extreme example of these differences would be the coarse hide of an elephant to the soft fine skin of a calf.

Sources of Leather

Pelts of animals arriving at a tannery come from one of the following sources:

1. City abattoirs.
2. Country slaughterhouses.
3. Large meatworks engaged in canning or meat export.
4. Trappers and hunters.

The pelts are classified according to their size:

1. Hide - a pelt weighing more than 25 lbs. These come from fully grown animals such as steers, horses, moose, deer, cows.
2. Kip - a pelt weighing between 15 and 25 lbs. These come from the young (or undersize) animals of the same group as above.
3. Skin - a pelt weighing less than 15 lbs. These come from smaller

animals such as sheep, goats, calves, rabbits, kangaroo, lynx, wolverine, etc.

A pelt is an untanned hide, kip or skin which, after tanning, is known as leather.

The Treatment of a Pelt

After a pelt is removed from an animal carcase (a process called flaying or skinning) it is treated by one of the following methods to prevent its decomposition before tanning.

1. Salting
2. Drying
3. Refrigeration

In the salting process the pelt is cured with clean new salt. Drying is done under cover or indoors to ensure thorough drying and to prevent spoilage from weevils. Refrigerated pelts are kept "green" until the tanning begins.

Tanning

The tanning of a pelt consists of 3 main processes.

1. Preparation for Tanning.
2. Actual. Tanning Processes.
3. Finishing Processes.

1. Preparation for Tanning

a) Sorting. On arrival at the tannery the pelts are sorted into various grades, depending upon their condition, weight and the type of leather for which they are most suited.

b) Soaking. The pelts are then soaked in clean water to remove all traces of dirt, blood snd salt and to make them soft and pliable (a condition similar to when the pelt was first taken from the animal. The soaking time depends upon whether the pelt was salted or dried and on its general condition.

c) splitting. Hides are generally split down the back at this time, into two sides, to make them easier to handle. Skins are tanned whole.

d) De-hairing. The sides, kips or skins are then put into a de-hairing solution containing hydrated lime and sodium sulphide of hydrosulphide. After a few days in this solution the pelts are forced through a de-hairing machine, in which blunt revolving knives remove the hair, leaving the skin fibres plumped (slightly swollen) and opened up.

e) Fleshing. The pelts are then fleshed by feeding them through machines, which remove all the fat and flesh left on the underside.

f) Scudding. The skins are then scudded to remove the remaining hair roots and some of the natural grace.

g) De-liming. The pelts are next de-limed by a number of washings in clean water. If complete de-liming is necessary, they are soaked in a slightly acid solution.

The pelts are now ready for the actual tanning. All the flesh and hair has been removed, some of the natural grease has been removed and the fibres have been separated to permit the penetration of the tanning materials.

2. Actual Tanning Processes

The two most common methods of tanning a prepared pelt will now be dealt with.

a) Vegetable Tanning (sometimes known as Bark tanning). This is one of the

oldest methods of tanning known to man. The Hebrews are credited with discovering this method many thousands of years ago.

The tanning material is a vegetable tannin (hence the name tanning) found in bark, leaves and fruit of various trees such as Wattle, Chesnut, Oak, Mangrove, Sumach and certain Eucalypts. In Australia wattle bark is commonly used for this purpose. The tanninis obtained by infusion (steeping or standing the bark, leaves and fruit of these trees in water). Depletion in the supply of oak in Canada has necessitated the import of Quebracho from South America. This is now the main source of tanning agent.

The actual tanning process consists of suspending the pelt in a solution of tannin (or tannic acid) in water. The tan liquor slowly penetrates the pelt turning the Collagen, which is a substance found in the interlaced fibres of the skin, into leather. The solution is made stronger and fresher each day and the pelt is examined at intervals to discover how far the tan has penetrated. The pelts are then removed from this solution and placed in a layer pit, where they are stacked with other pelts. The pelts are separated by sprinklings of solid tanning material. Here they remain for as long as 6 months depending upon the thickness and future use of the pelt.

At the end of this treatment the pelts have become leather and are ready for the various finishing processes.

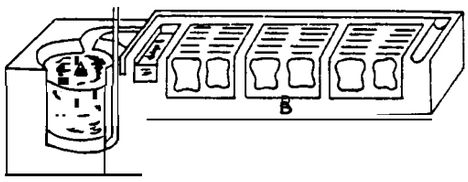


Diagram showing the method of bark tanning leather.

A. The tank is which tanning liquor is made.

B. The suspender pits in which the skins are hung.

b) Chrome Tanning. This is a much quicker method of tanning and after the pelts are prepared for the actual tanning process, they are treated as follows.

Pickling - this is the process of soaking the pelts in a solution of salt and acid. This changes the pelt from the slightly alkaline condition (caused by the limeused for dehairing) to the acid state required for chrome tannage. This process also helps to open up the pores of the pelt.

Drumming - the actual tanning is carried out by revolving the pelts in very large drums containing chromium salts. Within a few hours chrome tanned leather is produced.

Finishing Processes

The finishing processes for leather tanned by either the chrome or vegetable methods, are many and varied. Some of these are as follows -

a) Washing. Leathers coming from the tanning solutions must be washed to remove the excess tanning materials.

b) Splitting and Shaving. The leather is brought to the approximate thickness by splitting and then finally shaved to the correct substance (thickness). (The splitting may also be carried out before tanning when the leather is in the limed condition.)

c) Fat-Liquoring. This is the process of adding oil in emulsion form to the leather. The oil (such as fish oils, soaps and greases) prevents the fibres from gluing together as the leather dries out and is responsible for giving leather its flexibility.

d) Dyeing. If a coloured leather is desired, it is rotated in a large drum with an appropriate dye solution (such as an analine or coal tar dye/water solution). After dyeing the leather may go through a number of other finishing processes which remove creases, smooth and remove

excess water in preparation for drying.

e) Drying. This is the process of pasting the moist leather onto large vertical glass screens. The screens pass through a drying machine on a slow conveyor belt system, which dries the leather smooth and free from wrinkles.

The dry leather may then be further finished, by any of the following processes -

f) Glazing. A polished finish obtained bypassing the leather through glass pressure rollers.

g) Buffing. By buffing the flesh side of leather with an abrasive roller to produce a nap or fine pile, a suede is produced.

h) Imitation Printing. Cheaper or second grade leathers are usually printed with an imitation reptile pattern, which gives the appearance of a more costly leather and camouflages any small. imperfections in the skin.

i) Grain correcting. This is the process of applying a pigment (powdered filling material) to the grain side of the leather to hide any imperfections. This solid colouring matter fills the pores of the leather, giving the surface a uniformity resembling lino or plastic. This is technically known as corrected grain leather. This finish gives a more receptive surface for shoe polish and improves the resistance to water penetration, but completely hides the beauty of any natural grain markings in the leather.

j) Hand Boarding or Hand Graining. This is the process of raising the grain of leather by folding the skin in half, grain to grain, and firmly drawing a cork faced board across the fold, thus forming a series of creases across the skin. Morocco is a boarded Goat skin.

k) Lacquering. A type of finish obtained by spraying the leather with nitro-cellulose type lacquers for a gloss finish. Pat ent leather is a special type of lacquer finish.

Other Methods of Tannage

From the previous notes you will have realized that Chrome Tanning and Vegetable Tanning are the two most common methods used today. It has been estimated that more than 90% of all leathers are tanned by either of these methods. However, for special applications there are other methods. For example an Alum tannage method is used for gloving leathers; Formaldehyde tannage is used for washable leathers; Oil tannage is used to make wash leathers, e.g. chamois leather; while Parchment is manufactured by a special liming and stretching process.

Alum Tannage

The chief use of Alum tannage today is for the manufacture of gloving leathers from sheep and goat skins. The method used is to place the skins in a revolving drum containing alum, salt, egg yolk and wheaten flour. The leather is then dried, softened in damp sawdust, shaved to the required thickness and staked (softening the skin by forcibly dragging it over blunt blades in a machine). Finally the leather is oven dried and left to age to further increase the softness.

Historically Alum tannage is one of the oldest methods known. It originated in Ancient Egypt and until recently was known as "tawing".

The advantages of Alum tannage are -

a) It is one of the few tannages which produce a pure white leather.

b) The leather produced is very elastic.

Both of these points are important in glove making; however? this leather loses its tannage when wet and subsequently dries out hard. For this reason Alum

tannage is followed by Formaldehyde tannage when a washable glove leather is required.

Formaldehyde Tannage

Formaldehyde tannage is seldom used separately. As previously stated it is used as a complementary method of tannage, to change Alum tanned glove leather into a washable material. It is also used as a preliminary to Oil Tannage in the manufacture of chamois leather.

The method used is to revolve the skins in a drum containing a 5% solution of Formalin to which has been added Sodium Hydroxide to render the solution slightly alkaline.

Oil Tannage

The term chamois originally referred to the leather made by oil tanning the pelt of a European species of antelope known as a chamois. Nowadays chamois leather is made almost entirely from the flesh split of a sheepskin. It is used for wash leather, clothing, garments and cheap gloves.

The method used, after the usual procedure of preparing the pelt for tanning, is to revolve the flesh splits in a drum containing a mixture of fish oil (either cod-liver, whale or seal) and a drier (cobalt and manganese linoleates). Once the oil is fully absorbed into the flesh split it is oxidized bypassing a blast of hot air through the hollow axle of the drum. The splits are then washed in a weak soda solution to remove the excess oil, washed in a warm soap solution and dried.

Historically oil tannage is a refinement of ancient man's method of preserving skins and hides by rubbing into them the fats and brains of the slain animals.

Properties of Leather

1. Strength: Leather is able to resist stretching and tearing. This is shown in its

use for belts and saddlery.

2. Flexibility: Leather can be bent and twisted many times without weakening or breaking.
3. Weight: Leather is a very light material. This property was useful for its use in clothing.
4. Durability: This means that the leather will last a long time and resist wear and weather.
5. Porosity: Leather is able to allow air and moisture to pass through it. This is very useful in footwear.

The fibres of vegetable tanned leather are much larger in size thsn those of chrome tanned leather, which are thin, as in dried skin. The vegetable tanning expands the fibres giving them greater weight and solidity.

Because of the thicker leather produced, this process is preferred for tanning shoe-sole leather.

The nature of the fibres in vegetable tanned leathers and their ability to absorb moisture easily, makes them ideal for all. modelling, carving and moulding purposes.

Chromed leather, though chiefly used for footwear uppers, is used for leather goods which need to be soft and pliable. It has water resisting qualities which make it an unsatisfactory leather both for cut edge work (where the edges are to be finished with a water dye) and for tooling. However its water resisting properties help to resist the entry of external water for footwear uppers, yet still allows the passage of some perspiration from the foot. This unique property of leather (its abilityto 'breathe') is the reason whyit is unlikely to be completely replaced by a synthetic substitute such as plastic.

The chrome tanning process is much faster than the vegetable method and is

usually used to tan the better quality pelts, taken from the younger cattle.

The colour of the interior of chrome leather has a greyish green tint, which is easily recognizable unless the leather is heavily dyed. Vegetable tanned leathers in their natural state, are the familiar pale biscuit or light tan colour. Chrome leather has a springy and flexible feel, whereas vegetable tanned leather is much firmer.

Types of Leather

The skins of practically all animals, birds, reptiles and fish may be made into leather. There are thus many leathers suitable for craftwork. The main types that are readily available will be discussed here. Most of these leathers are available in a variety of colours as well as natural. finish.

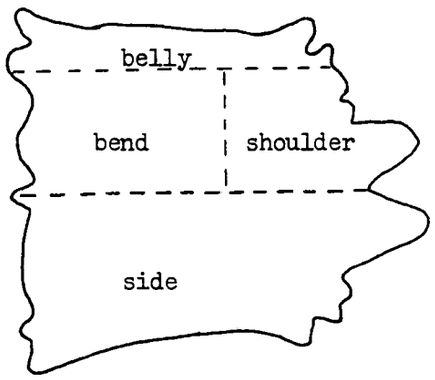
Size of Skins

When large hides such as cow hides are tanned they are often cut into smaller pieces for ease of handling. These sections are named below. Calf, goat, and sheepskins are usually processed in the full skin.

1. Full Hide: The whole skin which would be needed for upholstery or garment leathers.

2. Side or Half Side: This is a skin that has been cut in two along the back-bone, often used for shoe leather and travel goods.

3. Bend, Shoulder, and Belly: These are portions made bycutting a half-hide. They are used mainly for shoe leather.



Thickness of Leather

The thickness of leather is measured in ounces. This comes from the old method indicating the thickness of the leather by the actual weight in ounces per square foot. For example, a square foot of sixteen ounce leather would weigh sixteen ounces. For a rough guide, one ounce leather measurement represents about 1/64" thickness.

Sale of Leather

Small lizard skins are sold by the square inch and snake skins are sold by the lineal inch. Larger skins are sold by the square foot. Heavy hides are often sold by the pound.

Types of Leather

All of the leathers discussed below are vegetable tanned. Chrome tanned leathers are not very suitable for craftwork as they will not hold a modelling impression.

1. Lambskin

Lambskin is a smooth leather made from the skins of young sheep. It is often embossed or made into suede leather. The leathers from 1 to 2 ounce weight and the skins vary in size from 5 to 7 square feet.

2. Sheep or Roan

Sheep is a smooth-grained leather made from sheep skin. It is not as strong, as durable or as good for tooling as calf. It is used for gloves and cheap travel goods. The weight of sheep is from 1½ to 3 ounces. The skin size varies from 7 to 10 square feet.

3. calf

Calf is a fine, smooth-grained leather made from very young calves. It is the best modelling leather for small projects. It is used for bags of all. kinds. The weight of calf varies from 2 to 4 ounces. The skin size ranges from 10 to 15 square feet.

Note: Calf can be distinguished from sheep because sheep may be easily split by tearing the top layer away from the bottom layer of the leather. Calf will not split in this way.

4. Cowhide

Cowhide is a strong pliable leather made from cows hide. It can be easily tooled, carved, stamped and embossed. It is ideal for belts and jobs that must withstand hard wear. It varies in weight from 2½ to 5 ounces. The skin sizes range from 15 to 25 square feet.

5. Steerhide

Steerhide is a crinkly-grained leather, made from steer skin. It is pliable

and tools nearly as well as calf. It is an all purpose leather used for footwear, protective clothing, etc. The weight of the leather varies from 3 to 6 ounces. The hide runs from 15 to 30 square feet.

6. Skiver

Skiver is the very thin top or grain split of a sheepskin made by slicing the hide in a special machine. It is not very strong and is used as a lining and a bookbinding material. It varies from ½ to 3 ounce weight.

7. Suede

Suede is a velvety surface obtained by abrasive action on the flesh side of any leather, usually sheep. It is made in a wide range of colours for linings, garments, small handbags, and footwear.

8. Morocco Goat

Morocco Goat is a distinctively grained leather made from goat skin. This leather can be tooled. It is used for wallets, briefcases and quality bookbindings. The weight varies from 1½ to 3 ounces. The skins vary in size from 6 to 10 square feet.

9. Pigskin

Pigskin is a very tough and durable leather made from the skin of pigs. It has hair holes in groups of three which distinguish it from other leathers. Pigskin keeps its shape well, but not all pigskin can be tooled since it is a tight grained leather. It is used for high quality leathergoods. The skins range from 2 to 4 ounces and from 9 to 16 square feet.

10. Kangaroo and Wallaby

These leathers are made from the skins of the respective marsupial animals. They are extremely tough and durable leathers. They hold their shape well and are among the most waterproof leathers in the world. They are tight grained and tool only moderately well. The skins range from 2 to 4 ounces and from 6 to 12

square feet. They are used for high quality leathergoods, such as handbags and wallets, and for good quality footwear.

11. Rawhide

Rawhide is the traditional material for all braided work. It is not a leather because it has not been tanned and narrow strips of this material are known as strings, whereas narrow strips of leather are known as thongs.

Man learned to make rawhide long before he learned to make leather, because the method of making it is so very simple. Briefly the method of making rawhide is as follows:

1. As soon as a slain animal is flayed (skinned) stake out the hide (on the ground in the shade) to dry for about 2 hours. This converts the greenhide to rawhide.
2. Trim off any flesh still adhering to the flesh side.
3. *Loosen* and remove the hair.
4. Stretch the hide on a frame and allow it to dry.

Rawhide made in this manner is tough and lasting. The American cowboys used it for making many articles of their horse apparel, such as quirts, headstalls, bosols, reatas and reins. (If you don't know these terms look them up in a dictionary.) The Apaches shod their horses with rawhide shoes and fur trappers made mocassins from smoke impregnated rawhide. The Crowe Indians smoked deer skin and rubbed in cooked brains and liver to make a special type of rawhide called buckskin . Remote cattle ranchers used rawhide to lash together corral posts, riding equipment, crude furniture, etc. You have probably seen rawhide being used many times on drum heads and never realized it!

The Manufacture of Imitation Reptile Prints

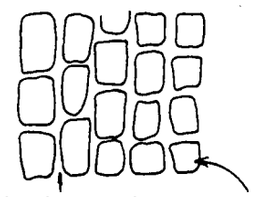
The six processes in the method of manufacture are set out as follows:

1. Tanning

   The calf skins are chrome tanned.

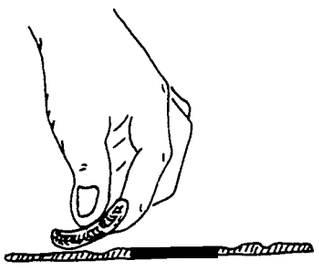
2. Staining (Background colour)

   The skins are stained all over to the 'background colour' with a water soluble analine dye. (This is the colour seen in the grooves of the leather.)



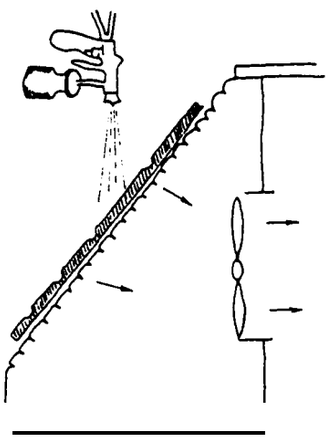
3. Embossing

   The crocodile pattern is pressed into the grain side of the skins in a special machine using an embossing plate under high pressure and heat.



4* Staining (Foreground colour)

   The foreground colour, which is usually darker, is applied to the high areas of the pattern by one of the following methods.



   (a) By hand - A cloth pad is dampened with the foreground colour stain and rubbed lightly over the leather. Because the pad only touches the high area of the pattern, this is the only area stained. Hence this gives the TWO-TONED or two colour effect.

   (b) By spraying - The foreground of the leather can be stained by spraying at an angle to the surface of the leather.

The skin is placed on a wire screen behind which is a fan. The fan helps to hold the leather in place and also carries away any excess stain.

5. Glazing - The skins are then sprayed with a clear leather lacquer.

6. Rolling - The skins pass through heated rollers which give an evenness and final gloss to the leather.

You may now ask - why go to this trouble to make an imitation crocodile printed leather? Genuine crocodile skin, apart from being very expensive is very hard to get in sny quantity. By making an imitation print on a common leather (calf), the shortage and high costs of crocodile is overcome. The only disadvantage of the imitation print is that it does not have the natural. attractiveness of the real leather.

Technical Terms

Here is a list of some of the more common technical terms "you will. find in textbooks and about which you should know something.

Applique braiding. A form of braiding which is worked directly onto the surface of the leather.

Basil. An undyed sheepskin. Top grain basil is known as tooling sheep.

Belly. The soft flexible edges of a skin or hide between the legs.

Boarding. A method of raising the grain of certain leathers. Morocco is a hand boarded goat skin.

Buckskin. A soft pliable leather made from chrome tanned deer or elk skin. Formerly made by rubbing the skins with brains and smoking them.

Buffing. The removal of the top layer of leather by means of a coarse abrasive. If the flesh is buffed, suede is produced. If the grain side is buffed velvet leather is produced.

Cement. (Rubber solutions or rubber cement.) A "Contact" type of adhesive suitable for attaching linings and in other situations where a flexible adhesive is required.

Chamois. A soft "wash" leather made by oil taming the flesh split of a sheepskin.

Corrected grain. Leather which has a grain printed upon it resembling its natural grain.

Crushed grain. A grain pattern obtained by tumbling damp leather in a drum to cause the surface to crease in an irregular pattern. Crushed kid is an example of this type of leather.

Draw gauge. A tool used for splitting leather in width. E.g. for straps, belts, etc. A plough gauge is similar.

Embossing. Leather printed or embossed with a pattern imitating a natural grain. E.g. Crocodile printed calf.

Hand embossing is done by raising a design above the surface of leather by pressing from the flesh side with an appropriate modelling tool.

Fid. An American term for stabbing awl.

Hide. Leather coming from animals as large or larger than cattle. E.g. cowhide, steerhide, horsehide, elephant hide, etc. Skins come from smaller animals, e.g. snake skin, rabbit skin, kangaroo skin, calf skin, etc.

Kip Leather coming from half grown (yearling) cattle. i.e. too small for hide - too large for skin.

Lacing. An American term for thonging.

Levant. A goat skin boarded in two directions.

Morocco. A goat skin boarded in eight directions. This produces a harder grain than Levant.

Natural. Undyed (of leather).

Parchment. The flesh split of a sheepskin made into an opaque material with a smooth surface. It is used as a quality writing material.

Patent. A high gloss, lacquer finished type of shoe and bag leather.

Rapid rivets. The Americsn name for speedy rivets. A rivet used where a good finish is required on both sides of the joined leathers.

Rawhide. An untanned hide.

Retan Leather (or Semi-chrome). Leather first tanned with vegetable then retanned with Chromium salts.

Roan. A dyed sheepskin.

Sammed leather (or Conditioned leather). Leather which has been moistened and allowed to partially dry preparatory to tooling, moulding, etc.

Side. Half a hide. The division is made along the spine.

Skiving. Paring leather to reduce its thickness at the edges.

Slunk. Unborn talk skin. The hair is very short. . . .

Snap Fasteners - Press studs.

Stitching. Hand sewing leather.

Suede. Leather which is buffed on the flesh side, thus producing a fine pile or velvet-like finish. Suede is used for shoe uppers, garments and racquet grips.

Thong. A narrow strip of leather.

Thonging. (a) A form of edge joining and decoration.

(b) The process of threading a thong through the holes *or* slits in the job.

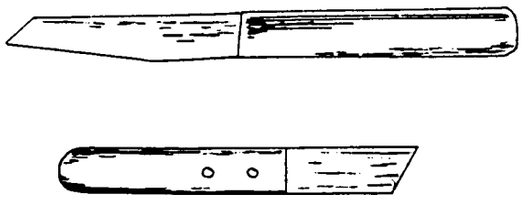
Vegetable tanned. Leathers tanned with vegetable tanning agents such as Oak or Wattle Bark.

Vellum. Similar to Parchment except that vellum is made from calf instead of sheep skin.

Venetian Lace. Commonly known as Florentine thong. It is whipstitching with a wide, thin thong.

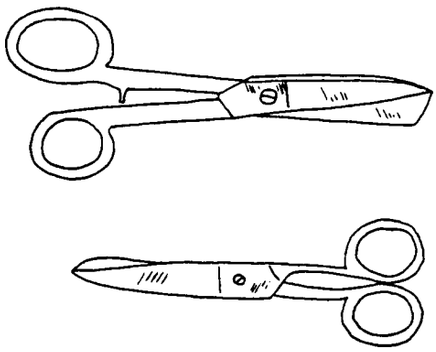
TOOLS FOR LEATHERCRAFT

There are many tools that can be used in leathercraft, however, most articles can be made using only a small number of inexpensive tools. The essential tools, together with some additional ones are shown below.



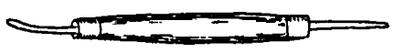
Leather Cutting Knife

The Leather Cutting Knife is used for cutting, mainly straight edges on leather and for skiving leather.



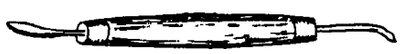
Scissors and Leather Cutting Shears

Scissors and leather shears are used for cutting leather of thin to medium thickness, especially irregular shapes.



Tracer Modeller

The Tracer-Modeller is a modelling tool with one straight tracing and stippling point and one medium size modelling end.

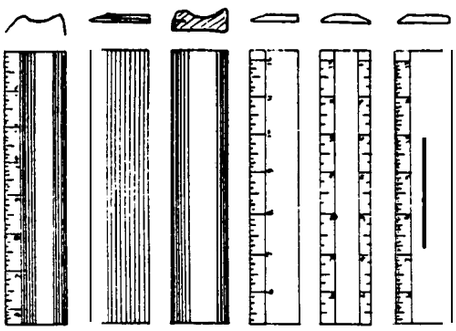


Dresden Tool

The Dresden Tool is a modelling tool for general modelling. It has two modelling points, one large and one small.

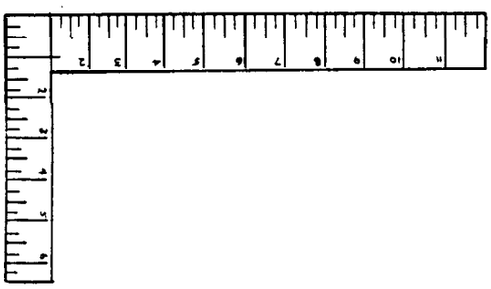
Stippling Tool

The Stippling Tool has six or more points and is used for rapid stippling of backgrounds.



Rules

The Rule is used for marking off distances, measuring distances, and ruling straight lines when marking out a piece of leather.

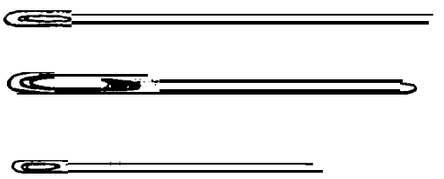


Steel Square

Steel Squares or plastic set squares are used for marking and measuring right angles when marking out a piece of leather.

Leatherwork Awl

The Leatherwork Awl is used for piercing lightweight leather, for enlarging holes when sewing leather and sometimes for scratching lines on leather.

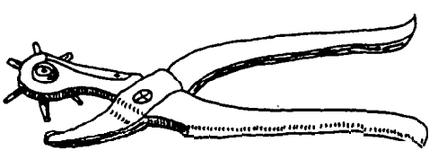


Needles for Leatherwork

Needles for sewing lightweight leathers may be glovers needles, harness needles, embroidery needles or darning needles.

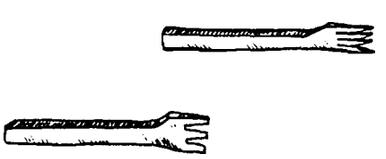
Hollow Punch

The Hollow Punch is used for punching round holes in leather and is available in sizes from 1/16" to ½". It is driven with a mallet or small hammer.



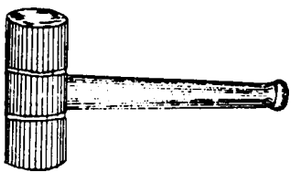
Six-Way Punch

The Six-Way Punch is used for punching round holes in leather. It can punch six different sizes.



Thonging Punches

Thonging Punches are used to make equally spaced slits for thonging.



Wooden Mallet

A Mallet is a useful tool for leather-craft for flattening the leather surface, folds in leather, and thonged edges.

Ball Peen Hammer

A Small Ball Peen Hammer of about 4 oz. to 6 oz. head weight, is suitable for leathercraft. It is used for driving punches and flattening folds and thonging in leather.

Press Stud Fasteners

Press-Stud Fasteners are used to fix press studs in position on the leather.

KNIVES

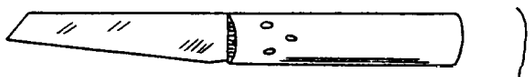
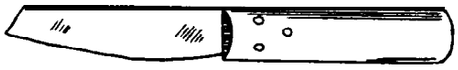
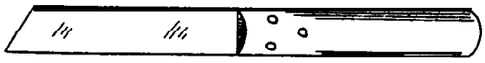
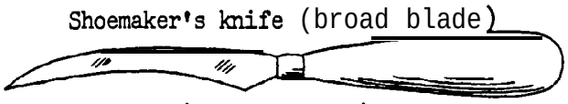
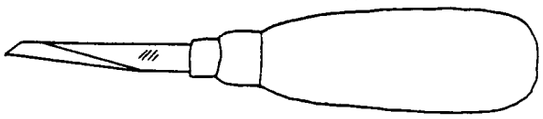
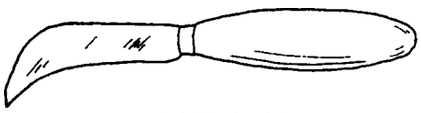
The expert leathercraftsman nowadays will use a variety of knives for special purposes. It is important therefore to know of some of the types which are available.

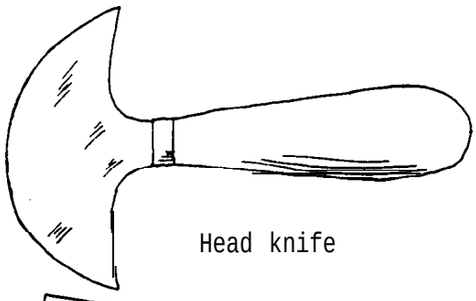
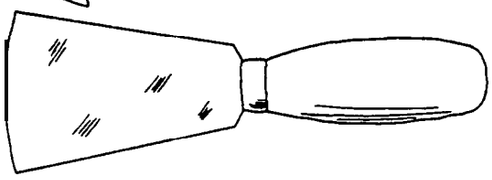
Knives come in 3 main categories.

1. Cutting (or Utility) - This group includes the shoemaker's knife, the clicker and the Stanley knife.

2. Paring (or skiving) - This group includes the bevel ended skiving knife, the head knife, the feather knife.

3. Ripping knives - This group includes the Hawkbill and McKay knife.

Group	Type of Knife	Uses
CUTTING (OR UTILITY) KNIVES	 Shoemaker's knife (clip blade)	General purpose knives for cutting leather, but can also be used for paring or ripping.
	 Shoemaker's knife (bevel blade)	
	 Shoemaker's knife (broad blade)	
	 Clicker (curved blade)	Cutting firm leather to shape.
	 Clicker (straight blade)	Cutting soft leather to shape.
	 Stanley knife	General purpose trimming knife with a number of interchangeable blades.
RIPPING KNIVES	 Hawkbill knife	Used by the shoe repair msn for ripping old soles from worn footwear.
	 McKay knife	A short bladed knife used specially for cutting the threads of stitched shoes.

PARING OR SKIVING) KNIVES	 Head knife	Cutting heavy leather to shape. Skiving (paring)
	 Feather knife	Cutting leather to shape. Skiving (paring)
	 Bevel ended skiving knife	Skiving leather.

AWLS

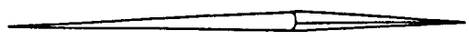
1. Saddler's Awl - (Also known as a Diamond, Bridle or Harness awl.)

This type of awl is a slender, diamond shaped piece of hardened steel; having two sharp edges which will easily cut through the leather. The awl is obtainable in lengths from $1\frac{1}{2}$" - 4",$2\frac{1}{2}$" being a very useful size.

Saddler's Awl

2. Stabbing Awl

Stabbing awls are similar in size to Saddlerts awls, but they are round instead of diamond shaped in section.



Stabbing Awl

Both the above types of awls, when fitted with a haft or handle, are used to make holes in leather for hand stitching. However, the saddler's awl is usually preferred because it gives a diagonal slant to the stitches.

Diagonal slant achieved with saddler's awl.

Stitching effect achieved with stabbing awl.

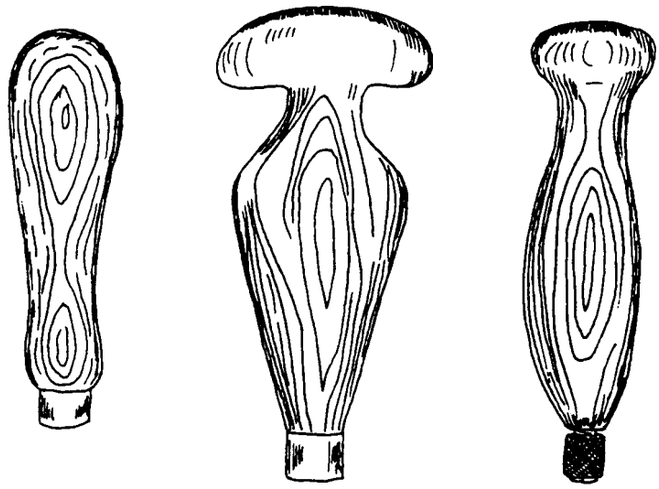
3* Curved Awl

These are round in section and are used for corner sewing (case and shoe work).

4. Awl Handles (or Hafts)

There are 3 common types of handles found on awls.

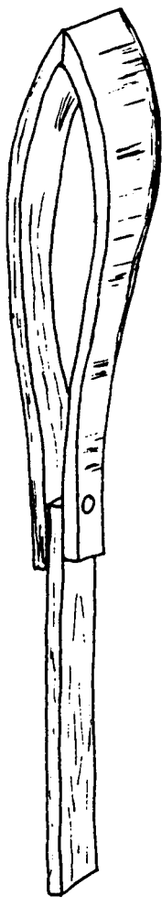
1. The Common handle which is long and pear shaped and used on light work.
2. The Mushroom headed handle which is used for heavy work.
3. The Patent Screw Haft which is used when it is necessary to quickly change awls. A three-jaw chuck is fitted into the end of the haft.



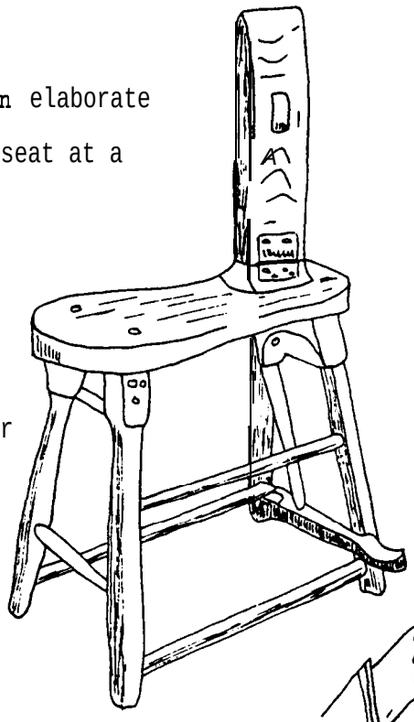
SEWING CLAMPS

A sewing clamp (or clam) is the appliance used for holding small work while it is being sewn.

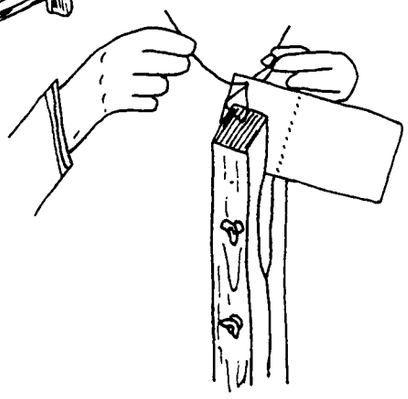
The saddler's sewing clamp consists of 2 pieces of steam bent timber (such as Beech or Ash) about 2 feet long and 3" wide. These 2 pieces are bolted to a leg, so that they spring tightly together at the jaws. This type of clamp is an effective support for most small work, even tough it is rather large and cumbersome. The jaws of the clamp should be sanded smooth and fitted with two pieces of thick suede to protect delicate leathers.



The stitching horse is an elaborate type of sewing clamp, providing a seat at a convenient working height.



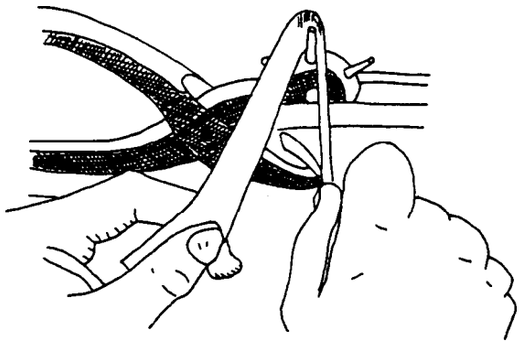
An improvised sewing clamp such as the one shown is an effective substitute. The jaws of this type are held together by a bolt and wing nut. This type is shown being used.



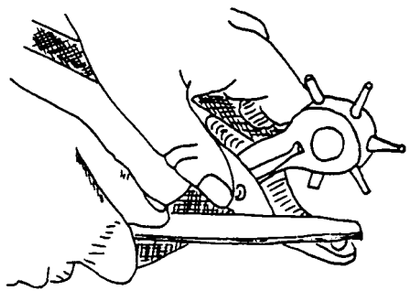
If you do not have a special sewing clamp, work can be held in a woodworker's vice (protected by smooth wooden jaws), in a book clamp or even between your knees (a very common method).

CARE AND MAINTENANCE OF TOOLS

1. Six-Way Punch



This tool should last you a long time without sharpening, provided you always remember to place a scrap piece of cardboard between the material being punched snd the anvil of the punch. This prevents the tube from biting through the leather and coming into contact with the anvil. If this occurs the tubes will dull quickly and the anvil will "score". The tubes can be sharpened by placing the punch in the vice and pulling a strip of medium grade emery cloth back and forth as you move it around the tube.



If the anvil has become "scored" file it down with a fine file.

2. Stabbing Awl

Protect its fine point by inserting it in a large cork when not in use.

3. Thonging Needle

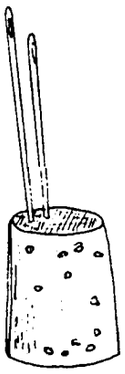
Always leave a piece of thong attached to it. This should prevent it from becoming lost.

4. Leather Stain and Polish

Keep the lids screwed firmly in place to prevent evaporation of the contents.

5* Harness Needles

Stick these in a cork for safekeeping.

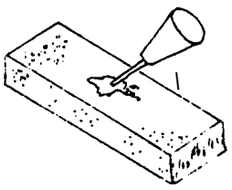


6. Dresden Modelling Tool

Should the ends become discolored before coming into contact with glue, rub with fine Emery cloth.

SHARPENING A CHISEL

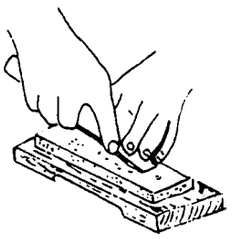
1. Squirt a small quantity of light lubricating oil onto your oilstone. The oil prevents the stone becoming clogged with particles of steel worn from the tool.



The best lubricating oil is a 50/50 mixture of neatsfoot oil and kerosene. If you cannot make up this mixture use one of the following:

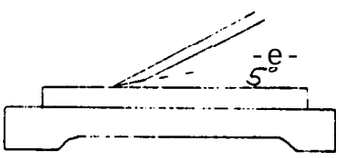
a) light machine oil

b) kerosene

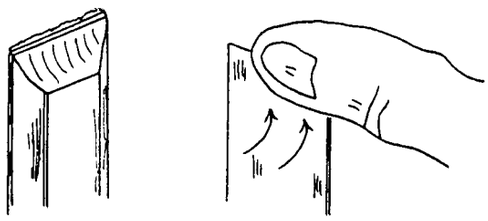


2. Hold the chisel as shown with the (Fig. 1) grinding bevel flat on the face of the stone. Raise the handle of the chisel slightly (about 5°) Fig. 2 and rub the chisel over all the face of the stone, keeping a constant angle.

3. Continue rubbing at this constant angle until a slight burr or wire edge can be felt at the cutting edge on the flat side of the chisel (Fig. 3).



2.

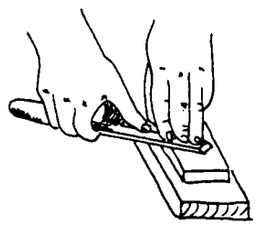


3

4. Turn the chisel over and remove the burr or wire edge by rubbing the flat side of the chisel over the face of the stone as shown (Fig. 4).

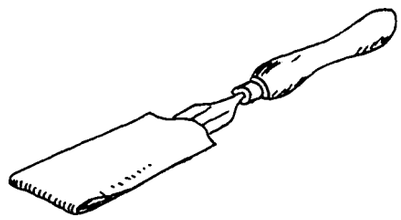
5. For a keener edge repeat steps 2, 3 and 4, but only using 2 or 3 rubs over the stone.

6. Wipe off any oil on the chisel or oilstone with sn old rag.



4.

CARE OF A CHISEL



Because the quality of the work done by a chisel depends largely upon its sharpness, you are strongly advised to keep your chisel in a boxboard or leather pouch or sheath as shown. This will protect the cutting edge when not in use.

SHARPENING A KNIFE

It is most important to use a sharp knife when cutting leather. It can be kept sharp by periodically "honing" it on the oilstone.

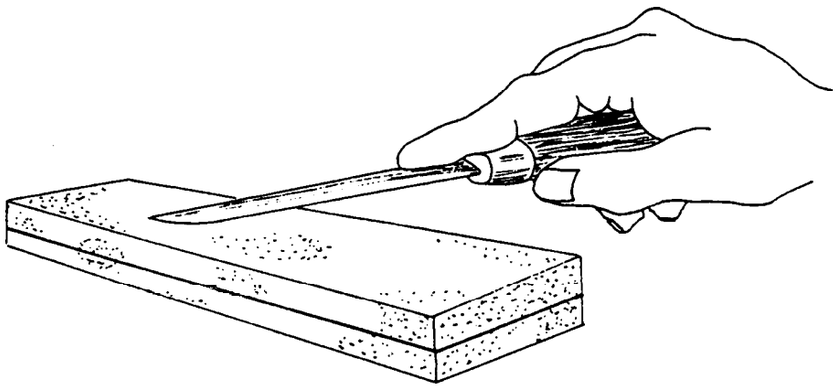
Steps in Sharpening a Knife:

Step 1: Place a few drops of oil on the surface of the stone (neatsfoot or machine oil) mixed in equal proportion with kerosene.

Step 2: Place the blade at a low angle to the stone, (about 8 degrees). Rub the blade up and down the surface until a burr is felt on the other side of the blade.

Step 3: Turn the blade over and repeat step 2 until the burr previously produced is removed.

Step 4: Clean the knife by rubbing with a piece of waste cloth.



Sharpening a Knife on an Oilstone

1. Keep the oilstone in the box supplied, except when using it.
2. Always use a light, non-drying oil such as 50/50 mixture of neatsfoot oil and kerosene or a light machine oil or kerosene, when sharpening with the oilstone.
3* Wipe off any old oil after use.
4. Always rub the tool you are sharpening over the full face of the oilstone to prevent wearing hollows in it.

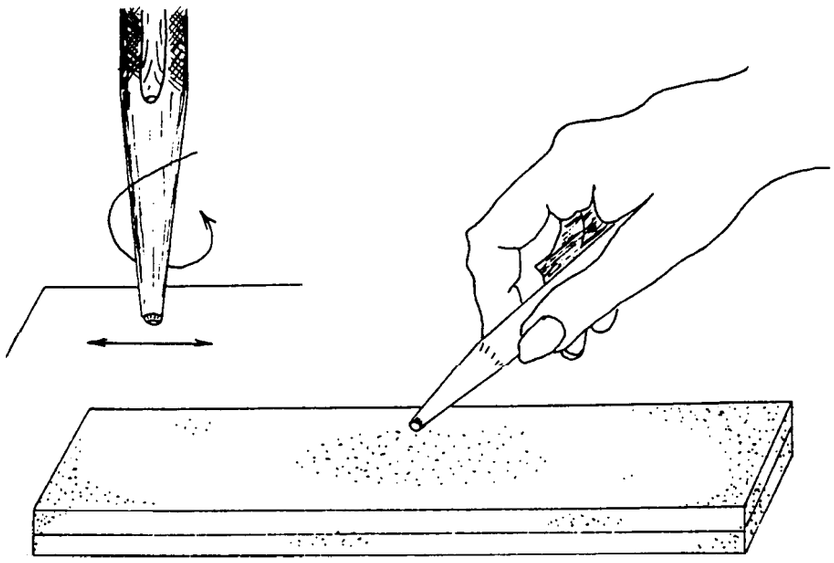
Steps in Sharpening a Hollow Punch

Step 1: Oil the oilstone.

Step 2: Place the punch on the oilstone at the grinding angle that you will see the punch.

Step 3: Push the punch backwards and forwards on the stone and at the ssme time revolve the punch so that the whole edge is sharpened at the same time.

Step 4: Clean the punch with a piece of waste cloth.



Sharpening a Hollow Punch on an Oilstone

THE GLUING OF LEATHER

Types of Glues Suitable for Leatherwork

Glues are used in leathercraft to hold pieces of leather permanently in place. They are also used to hold pieces of leather in position while sewing or thonging.

1. **P.V.A. (Poly-Vinyl Acetate) Glue**

   This type of glue has the appearance of white paint. It makes a very strong but inflexible join and, for this reason, should only be used on the parts of leather articles which are not subject to movement. E.g. attaching stiffening boards to cases, book covers, boxes. It can also be used to hold parts together prior to thonging and for joining thongs, although some other types of glue are more suitable for this. It sets quickly, but is not entirely resistant to

water. P.V.A. glue is available in small plastic bottles or tubes under the trade names of "Bondfast", "Prestoset", etc.

2. Rubber Solution

Rubber solution is a viscous (sticky) solution prepared by dissolving pure rubber in a petroleum mixture or a non-flammable solvent. It has the appearance of light coloured honey and because it is very flexible when dry, it is used for attaching linings to wallets, purses, bags, key cases and other articles subject to flexing. It is also used for attaching leather or crepe rubber soles to shoes.

Because rubber has poor penetrative qualities on most leathers, it is necessary to roughen the surfaces to be joined. The solution is applied to both roughened surfaces and when the spirit evaporates leaving the surface "tacky" the surfaces are pressed together.

These glues are very good for leathercraft, being strong and resistant to water and oil. Any rubber solution similar to those used in bicycle tube repsir outfits is suitable.

3 Latex*

Latex is another type of rubber cement (solution) made from the milk of rubber with the addition of ammonia as a preservative. It is a white substance which changes into a semi-transparent covering of rubber, when applied to a surface.

It has greater holding power, is easier to apply and dries quicker than the ordinary rubber solution, but its quality varies and it coagulates during storage.

The method of application and its uses are the same as for the ordinary rubber solution.

4. *Cellulose* Cements

These cements are made by treating cellulose, which is obtained from cotton fibre (cotton wool is almost pure cellulose), with various chemicals such as nitric acid or acetone. It is a clear substance which is used mainly for joining thongs and gluing down the loose ends of thonging.

Other Glues

Paper pastes can be used in leathercraft, but they are not very strong and they take a long time to set. They are satisfactory for gluing edges in preparation for sewing or thonging.

Special leather glues may be obtained at some bookmakers. These are very good, but it is unlikely that they may be purchased in small enough quantities for school use.

Resin Based Neophrenes snd Epoxy resin glues are now being used in addition to the above four types for special purposes. The older types of adhesives such as Hide glue, Fish glue and Paste have been largely superseded by the newer glues.

Gluing Operations

Generally, in gluing leather, the flesh side of the leather is the side on which the glue should be applied.

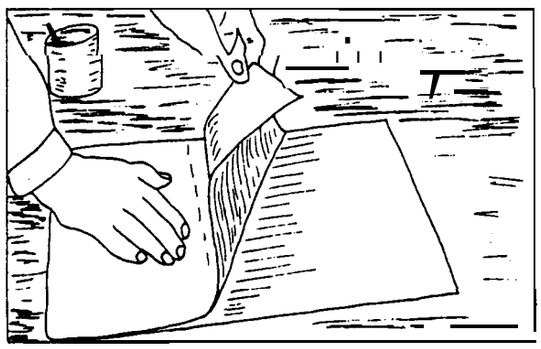
For all types of glues, the following steps should be followed:

1. Cut the pieces of leather to be glued to the required shape.
2. Place the leather pieces on some clean newspaper with their flesh sides facing upwards.
3. Squeeze some glue onto the flesh side of both pieces of leather and spread it thinly and evenly over the leather surface with a piece of scrap cardboard or your finger.

4. Take care not to spill any glue on the grain side of the leather as it will leave a mark that may be difficult to remove.

5. If you are using rubber solution allow a few minutes for the solution to dry, i.e. until the shine goes from the glue surface. For P.V.A. glue and pastes, no drying time is allowed.

6. Press one edge of each piece together. Then work towards the opposite edge of the article, pressing the surfaces together as you go.



Pressing together glued leather surfaces.

7. Allow time for glue to set before doing further work on the job. At least 15 minutes should be allowed (see instructions on the tube of glue that you are using). Some glues such as paper pastes, should be placed under pressure, a few large books say, during this time.

8. Trim the edges of the leather where necessary, using scissors, to ensure an even edge.

HAND SEWING OF LEATHER

The use of a thread to assemble leather articles by hand sewing has been the main method of leather construction for thousands of years. Hand sewing is still used extensively in leatherwork today, as it can be made tighter than machine sewing, and used in places hard to reach with a sewing machine.

Equipment Required for Leather Sewing

1. Needles

   Harness and glovers needles are especially made for sewing leather but ordinary large sewing needles are satisfactory for lightweight leathers.

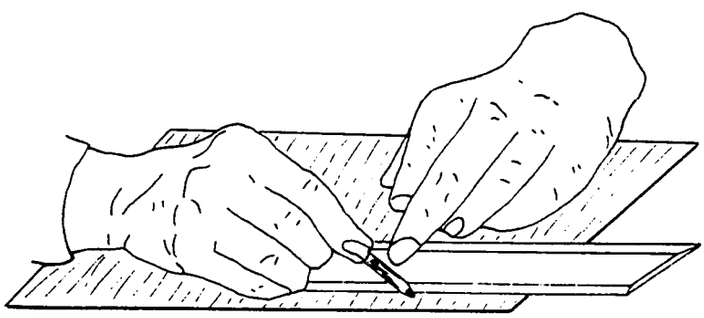
2. Threads

   Heavy flax (linen) thread, either waxed or unwaxed, is best for leathercraft. Number 10 thread is ideal for lightweight leathers. Heavy cotton threads may be used but they are not very strong. Nylon thread, which is very strong, is now being used a great deal in place of flax thread.

Preparations for Sewing

Step 1: Glue together the edges of the leather to be sewn.

Step 2: Tool a line using a tracing tool or empty ball point pen, 1/8" from the edge of the leather using a rule as a guide, in the position of the required line of sewing. This line should be deep enough to allow the stitches to fit just level with the leather surface. The line should be on the grain side or printed side of the front piece of leather, but may be on the flesh side or grain side of the back piece of leather, depending on the construction being undertaken.



Marking the line for the stitches.

Step 3: The number of stitches per inch will vary with the thickness of the leather from 12 stitches per inch on fine leathers to 4 threads per inch on heavy leathers. Use a rule and a sharp pencil to make dots on the tooled line where the leather is to be pierced. Do not mark anywhere else with the pencil.

Hand sewing can be done with either one needle, known as back stitching (or single hand sewing), or two needles, known as saddle stitching (or double hand sewing). Back stitching and saddle stitching are the two more common terms.

Back Stitching when viewed from the front side, consists of single stitches, but appears as double length stitches on the reverse side.

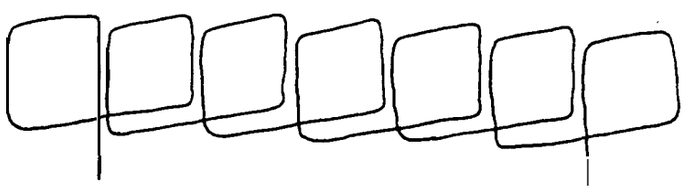


Diagram showing the thread formation for back stitching.

For this reason back stitching is used where the reverse side of the stitching is invisible. E.g. for attaching zippers, handles, tabs, straps, buckles and rings to bags and other types of cases. Back stitching is also useful for sewing through board reinforcing pieces, where the long stitch on the back will not cut through the board along the row of stitches as quickly as a short one.

Saddle Stitching when started from either side appears as a row of single stitches. In good saddle stitching each stitch should have a diagonal slant to it.

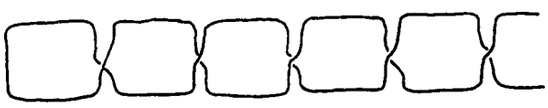
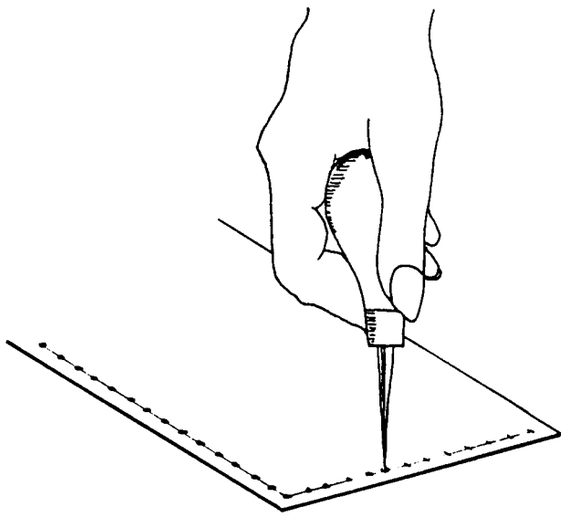


Diagram showing the thread formation for saddle stitching.

It is an extremely strong method of sewing used on such items as saddles, bridles, brief cases, overnight bags, footballs, handbags, etc.

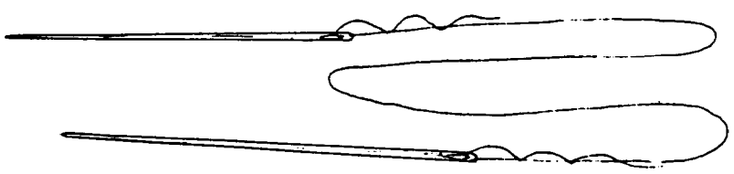


Spacing dots and piercing holes for sewing.

Step 4: Place the leather article on the punching block. Using a Saddler's Awl pierce holes on each of these dots.

THE SEWING OPERATIONS FOR SADDLER'S STITCH

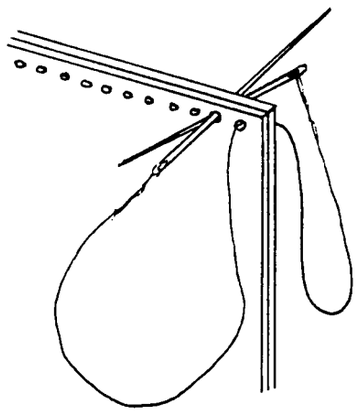
Step 1: Thread a needle with about three feet of thread. Leave about 3" of the thread through the eye of the needle and twist this around the long thread to stop the thread pulling out of the needle. Thread a second needle in a similar manner, onto the other end of the same thread.



Needles and thread ready for sewing Saddler's Stitch.

Step 2: Pass one needle through the first hole until there is an equal length of thread on each side of the leather.

Step 3: Pass both needles through the second hole, working from opposite sides of the job.

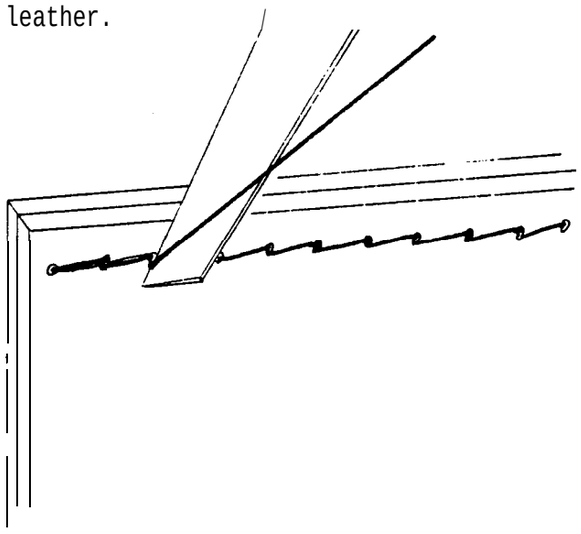


Starting the Saddler's Stitch.

Step 4: Pull the threads through from both sides until the stitch is tight.

Step 5: Repeat steps 3 and 4 to continue the sewing for all holes to be sewn.

Step 6: When the last hole is reached, or the thread is nearly at its end, finish off by sewing back over the last two stitches. Cut off the thread close to the leather.



Finishing and Cutting the thread.

Step 7: If stitching is to be continued after finishing a thread, commence as in Step 2 from the last hole through which the thread was passed.

NOTE: Practise this stitching on some scrap pieces of leather or cardboard using cotton thread, before attempting to sew a job.

NEEDLES FOR STITCHING LEATHER

The most common needles used for leatherwork are HARNESS NEEDLES. These are about the same length and shape as a common sewing needle, except that they are blunt pointed.

The blunt point allows the needle to pass easily through the awl hole without catching in the fibres of the leather or the thread.

Sizes of Harness Needles

00, 0, 1, 2, 3, 4, 5

Number 00 is the largest and number 5 the smallest. The size of needle to use is the smallest one through which the thread will pass.

Improvised harness needles can be made by grinding off the points of any of the egg eyed common sewing needles on a piece of emery board.

Another popular type of needle for stitching leather is the pliable COPPER NEEDLE. This type of needle (nowadays made of steel) is longer and more flexible than a harness needle.

PREPARING LEATHER FOR MODELLING

Definitions

Modelling of leather includes any operation that impresses a design

on the leather surface. This impression is made on the grain side of the leather, (except in the case of embossing).

Grain Side: Sometimes called the hair side; this is that side of the leather on which the hair of the animal grew and is usually smooth and grained with some particular pattern, depending on the animal from which the leather was made.

Flesh Side: The underside of the leather which was near the flesh of the animal. It is usually a rough surface resembling the surface of suede leather.

Modelling Leathers

Sheepskin: Sometimes called Roan; this is leather made from sheep skin and is suitable for modelling. The size of these skins varies from 7 to 10 square feet.

Calfskin: This is leather made from calfskin and is a very good modelling leather. The size of these skins varies from 10 to 15 square feet.

In order that the pattern may be modelled on the leather, the leather has to be softened by moistening in water.

The Moistening Operation

1. After cutting the leather to the required size, remove any dust and marks from the grain side with a cloth slightly dampened with cold water.
2. Place it on a clean surface (stainless steel sink or plastic tabletop) with the flesh side facing upwards.
3. Using the same cloth or a sponge soaked in cold water (the water should not run out of the cloth, but should come out when squeezed), moisten the whole piece of leather on the flesh side. The whole of the leather must be moistened, even if it is not going to be modelled, otherwise some discolored patches may appear on the finished article.
4. Check the appearance of the grain side of the leather by lifting up one corner. Continue moistening the flesh side until the grain side darkens. This shows that the moisture has gone right through the leather.

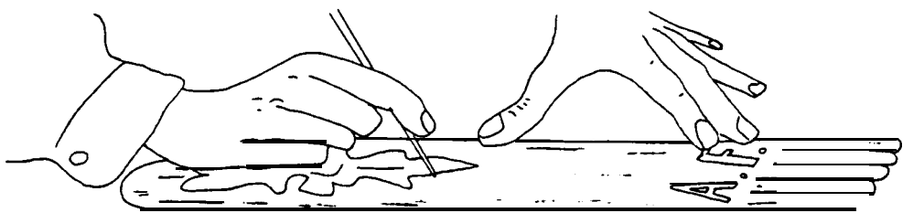
5. Place the leather on a dry surface with the grain side up. When the grain side begins to dry and return to its original colour the leather is ready to have the design traced on it.

Moistening Leather with a sponge.

The Tracing Operation

1. Place the moistened leather on a smooth, firm surface. "Laminex", glass and "Masonite" form excellent tracing and modelling surfaces.
2. The pattern for the shape of the leather or the modelling design is first drawn on a piece of white paper, or a printed pattern may be used.
3. Place the paper pattern over the grain side of the leather and trace over the lines onto the leather. A worn out ball point pen can be used as a tracing tool, or a pencil maybe used as long as no pencil marks are made on the leather, only the impression.

   The pattern may be held firmly in place with paper clips or cellulose tape while tracing.



Tracing Designs on leather.

FLAT MODELLING ON LEATHER

Flat Modelling is a method of placing a design onto leather. Firstly,

the basic shape is tooled on, using the outline tooling process. Then the background is set down so that the main design stands out clearly from the leather surface.

The depressed area may be left smooth or given a patterned effect by stippling.

Colour can be applied to either background or design, depending on the overall effect desired.

Flat Modelling Operations

Step 1: Moisten the leather for modelling.

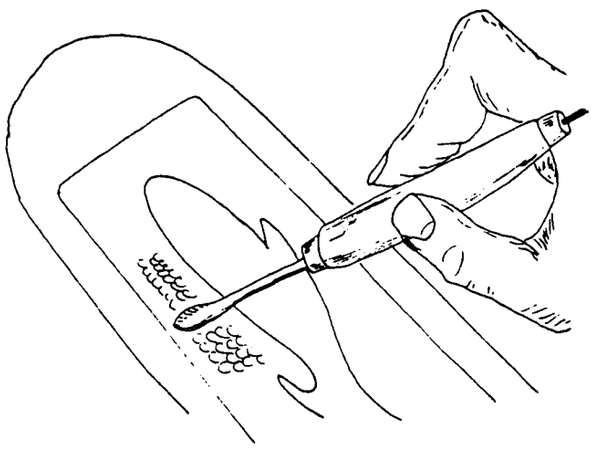
Step 2: Place the leather on a hand surface such as a piece of "laminex", "masonite" or glass.

Step 3: Trace a suitable design for modelling.

Step 4: Work over the design and margin in outline tooling.

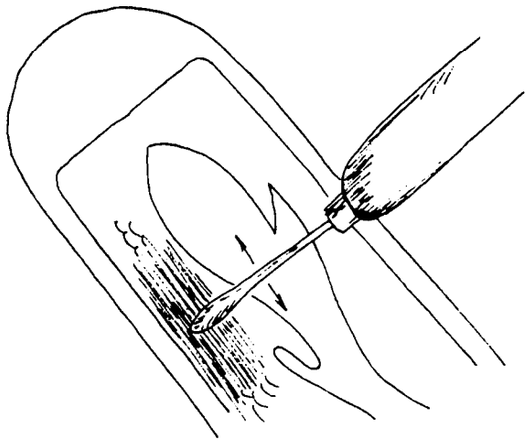
Step 5: Using the broad end of a modelling tool, press down the main areas of the background, starting at the centre. Work towards the outside edges, but leave the last 1/16" unpressed at this stage.

You should push the leather down, using firm pressure, continuously lifting and repositioning the modelling tool.



Press down main areas of background first.

Step 6: Work over this area again using firm pressure and a short back and forth motion. This produces a smooth flat surface, free of tool marks.



Rub these areas down flat, using firm pressure and short back snd forth action.

Step 7: The edges are now pressed down. The broad end of the modelling tool is used to work from the previously pressed down centre section, to the outline tooled edge. Continue using a short back and forth motion when working along the edge.

The edge of the modelling tool is slightly tilted towards the outline tooled line. This is dcme to produce a sharp finished edge.

If you have difficulty in making a straight edge with the modelling tool as described above, you can use the index finger to guide the tool.

Step 8: Make sure that the leather remains at the correct moisture content for modelling.

Background Stippling Operations

Stippling consists of a large number of dots uniformly spaced over the leather. The point of any modelling tool, tracing tool or worn out ball-point pen

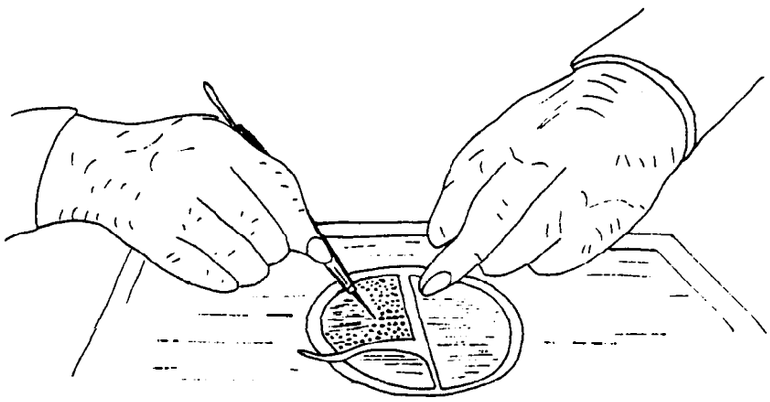
maybe used. Special stippling tools have seven or more points to do a faster job. Tools with points of different size will produce a different stippled pattern.

Step 1: The leather should be at the same moisture content as for modelling.

Step 2: Work on the same hard modelling surface as above, with the stippling tool held so that the point contacts the leather in an upright position.

Step 3: Place the point of the stippling tool where a dot is required and apply pressure. The tool may be turned as pressure is applied ifa deeper impression is required. Do not press so hard as to cut into the leather.

Step 4: Work on the whole of the area to be stippled, placing dots close together and uniformly spaced. Dots should go right to the edge of the area being stippled.



Stippling a background with a modelling tool.

Step 5: When all modelling has been completed, the leather is allowed to dry.

LEATHER THONGING

Thonging is the lacing of the edges of leather articles with a narrow piece of leather called a thong. The thonging serves two purposes:

1. To hold the edges of the two pieces of leather together, and,
2. decorate the edges of the leather.

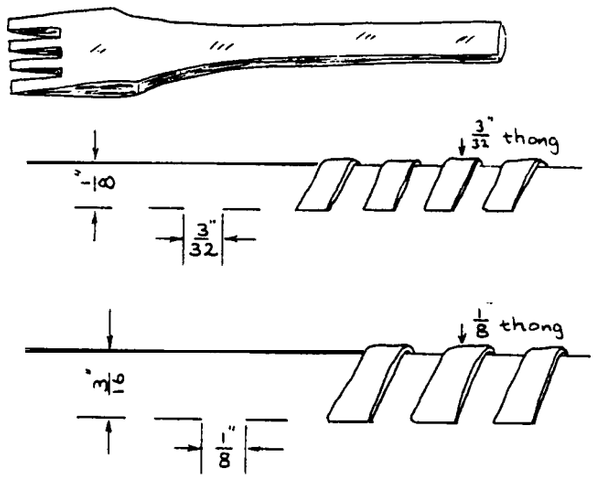
Sometimes one thickness of leather is thonged along the edges for decoration alone.

Thongs are made from strong thin leather such as calf, kangaroo and goat of which kangaroo is the most suitable. Thongs can be cut from a skin using a knife or a pair of scissors, but it is a difficult job. Thongs are cut in factories on a special table to which there is attached a number of special knives. The skin is rotated against the knives, which results in a continuous length of thong being cut.

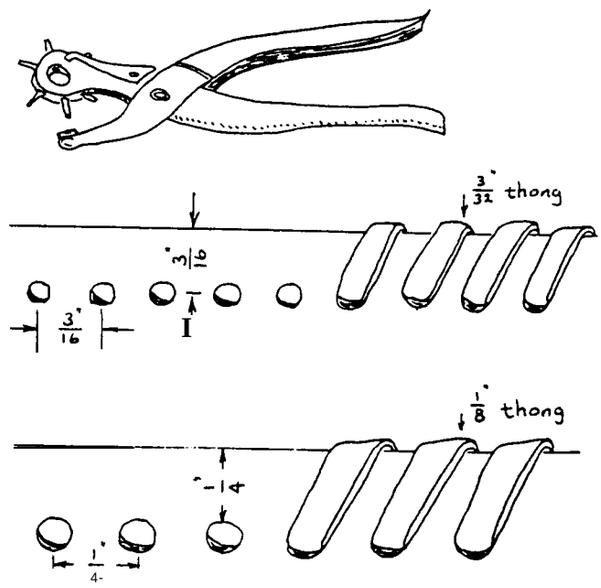
Thong can be purchased in several widths, 1/8" being the most used, 'and in various colours including natural finish which may be coloured before use. It is sold by the yard or in balls or spools from 50' to 250 yards.

How to Space Thonging Holes

There are no rigid rules governing either the distance between thong slits or holes, or their distance from the edge of the leather, but the following sketches can be used as a guide.



(a) Using a thonging chisel.



(b) Using a 6 way punch,

How to Calculate the Amount of Thong Required for a Project

This is sometimes a difficult job because it depends upon a number of factors:

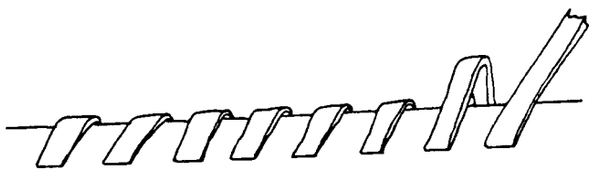
a) The size of the thong being used.

b) The spacing of the thong holes, both from the edge of the leather and between each other.

c) The thickness of the leather.

d) The style of thonging, whether whipstitch, single or double buttonhole.

Method 1: Multiply the total number of inches to be thonged by the amount of thong it takes to do 1 inch of the project. You will first have to thong 1 inch of the model and measure the length of thong used.



Whipstitch thonging

Single buttonhole

Double buttonhole

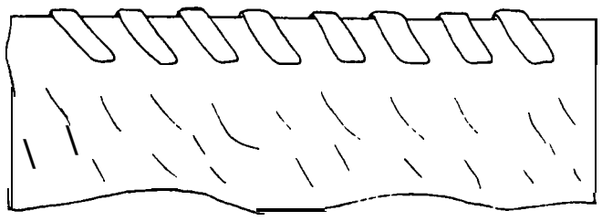
Method 2:

a) For Whipstitch thonging
Multiply the total length to be thonged by 4.

b) For Single Buttonhole.
Multiply the total. length to be thonged by6.

c) For Double Buttonhole.
Multiply the total length to be thonged by 8.

There are many types of thonging stitches. The two samples of these, called whipstitch and single buttonhole stitch will be described here.



Whipstitch Thonging.

Whipstitching Operations

Step 1: After cutting out the pieces of leather in their finished position, glue the entire inner surface, if it is a lining that is to be thonged to a cover, or glue only a $\frac{1}{4}$" strip around the edges if it is a hollow article being constructed. In either case leave about $\frac{1}{2}$" of the edge unglued at the starting position, and, if the thonging is not to finish at the starting position, also at the finishing position.

Step 2: Mark out lightly the position of the thonging holes on the least seen side of the article using a tracing tool. To do this, draw a line $\frac{1}{4}$" from the edges of the leather to be thonged. Then mark off dots every $\frac{1}{4}$" along this line.

Step 3: Thong is sometimes threaded through slits made in the leather but, to begin with, round holes will be found to be much easier to thread. The size of the hole depends on the size of the thong. If slits are used, the length of the slit should be equal to the width of the thong. For round holes, the diameter of the hole should be just less than the width of the thong. Punch holes to suit the thong being used, on the marked out dots.

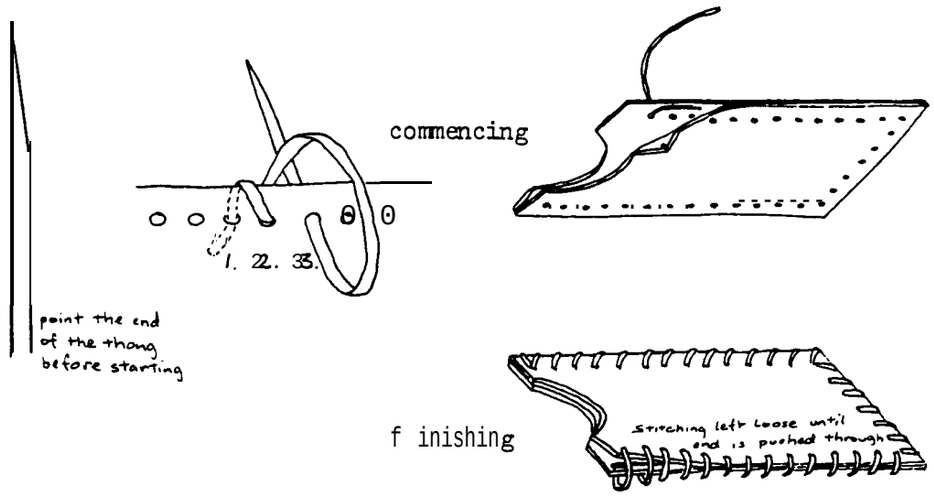
Step 4: Cut off enough thong for the job as long as the length is not over 3 feet as this would be awkward to use. For whipstitch the length of thong required is about three times the distance to be thonged. Cut one end of the thong to a taper in width and thickness, for ease of threading. Slightly stretch and straighten this thonging by running it a few times over the corner of a table or through your fingers.

Step 5: The thonging may be commenced at any convenient place so that the end of the thong may be pushed down between the two pieces of leather. Full the leathers slightly apart at the small unglued section left for starting. Thread the end of the thonging that has not been sharpened to a point, through the first hole cm the side away from you, and push ½" of it down between the leathers. Make sure that when the thong is brought over the top of the stitch, the grain side is outwards.

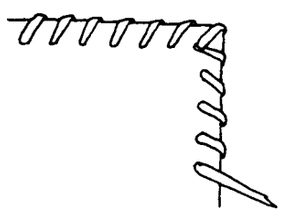
Step 6: If the thonging is to go right around the article and finish in the starting hole the edges of the leather are not glued until the thonging is completed. However, if the thonging is to end at some other position, the edges should be glued and placed under a weight to dry for about 15 minutes.

Step 7: Holding the job in one hand, bring the lace over the top of the edge and insert the pointed end from the nearside of the job into the first hole again, (if the thonging is to finish in some position other than the starting position) or the second hole, (if the thonging is to finish in the starting hole). Pull the thonging tight until it is flat over the edges of the leather.

Step 8: Continue with this over-threading from left to right, keeping the same tension and slope of stitching throughout.



Step 9: When thonging around corners go through the corner hole twice.



Thonging a Comer.

Step 10: Finish the thonging by cutting the thong off ½" longer than the length required to go into the last hole. Push this ½" end through the last hole, then down between the two pieces of leather as at the start. The open section is then glued together as described in Step 6.

Step 11: If only a single thickness of leather is being thonged the starting snd finishing is done by threading the ends of the lace under several stitches on the back of the job, or if the leather is thick enough it may be split so that the ends are hidden.

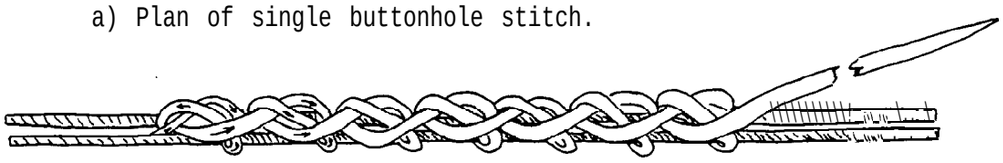
Step 12: Place the thonged edge of the job on a punching block and using a mallet or hammer, lightly tap the thonging to flatten it.

The Single Buttonhole Stitch

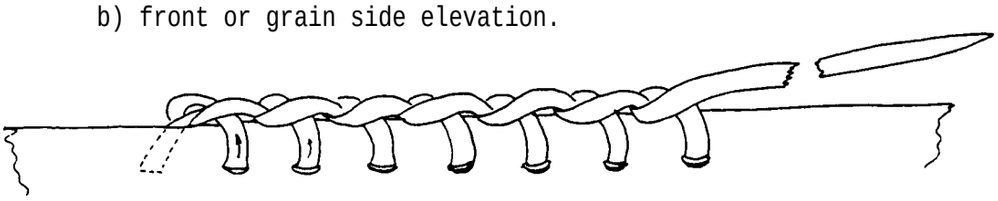
The whipstitch thonging already described is an easy method of thonging. It does not, however, conceal the edges of the leather which may spoil the appearante of the job.

A better method of thonging which does cover the edge of the leather is called the Single Buttonhole Stitch. This is also a more decorative method of finishing an edge.

a) Plan of single buttonhole stitch.



b) front or grain side elevation.



Single Buttonhole Stitching Operations

The steps described below should be practised on scrap pieces of leather (or cardboard) before attempting the stitch on a job.

Step 1: After cutting out the pieces of leather to be thonged, glue them together in their finished position. If it is a lining that is to be thonged to a cover glue the entire inner surfaces. If it is a hollow article such as a purse that is being constructed, glue only a $\frac{1}{4}$" strip around the edges to be thonged.

In either case leave about $\frac{1}{2}$" of the edge unglued at the starting

positicm, and if the thonging is to finish at some other position leave about ½" unglued at this finishing position. The starting position should be the top left corner of the job, looking from the back.

Step 2: Mark out the positions of the thonging holes on the least seen side of the article, using a tracing tool. To do this, draw a line ¼" from the edges of the leather to be thonged and mark off dots every ¼" along this line, as preciously described for Whipstitch thonging.

Step 3: Punch holes to suit the thonging being used, on the dots as described.

Step 4: Cut off enough thonging for the job, but not longer than three feet as it would be too hard to thread. For single buttonhole stitch the length of thonging needed is six times the distance along the edge to be thonged.

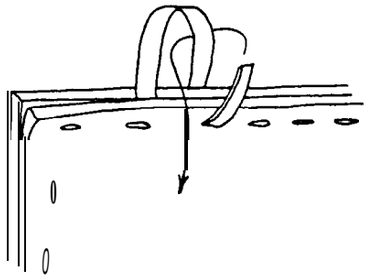
Cut the end of the thonging to a taper for ease of threading. Slightly stretch and straighten the thonging by running it a few times over the corner of a table or through your fingers.

Step 5: Hold the job with its back towards you. Starting at the place where the edges have not been glued, push the back, untapered end of the thonging down between the leathers so that when the thonging is threaded through the first hole from the side away from you, its grain side will be outwards.

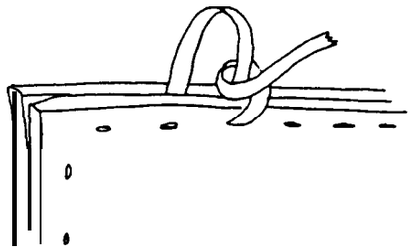
If the thonging is to end at some place other than the starting place the edges of the leather maybe glued, but if the thonging is to finish in the same place do not glue the edges of the leather at this stage.

Step 6: Push the pointed end of the thonging through the first hole from the side away" from you and pull. all the thonging through except for a 1" diameter loop .

Step 7: Take the tapered end of the thonging over to the side of the job away from you and thread it through the back of the 1" diameter loop. Pull nearly all of the thonging through, leaving the stitch so formed, loose.



Comment ing thonging the Single Buttonhole Stitch.

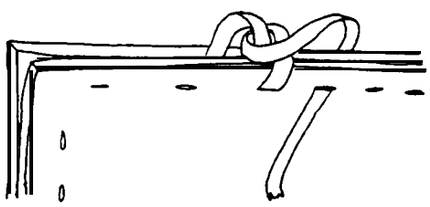


Threading through the loop.

Step 8: Pull the stitch tight from the front of the hole and then pull the end of the thonging to tighten the loop. Do not pull. the thonging too tightly as this will crease the edge of the leather. Full only tightly enough for the thonging to lie flat on the edge of the leather.

Make sure that the grain side of the thonging is always facing outwards.

Step 9: Take the tapered point of the thonging over to the side of the job away from you and thread it through the next hole from that side of the job. Pull all the thonging through the hole except for a 1" diameter loop.



Threading the second stitch.

Step 10: Thread the thonging through the back of the 1" diameter loop as described in Step 7.

Step 11: Pull the stitch tight as before, from the front of the hole, then pull the end of the thonging to tighten the loop.

Tightening the stitch.

Step 12: Repeat steps 9, 10 and 11 until the last hole to be thonged is reached.

Step 13: When thonging around comers go through the corner hole twice.

Step 14: When finishing the thonging at some position other than the starting position, finish the last stitch as at step 11. Cut off the thonging so that there is only $\frac{1}{4}$" of it protruding from the hole. Push this end down in the space where the two pieces have not been glued and then glue the two edges together.

When finishing the thonging at the starting position finish the last stitch as at step 11. Full out the first thread from between the leathers and from the first loop leaving the loop open. Cut this end of the thonging to $\frac{1}{4}$" from the back of the hole at the side away from you and push it into this hole and down between the leathers.

Cut off the finishing end of the thonging at 3/4" from the last stitch and push this end through the open loop and down between the leathers. A modelling tool or the pointed blade of a pair of scissors can be used for this operation. Glue the two edges of the leather together in this position.

Step 15: If only a single thickness of leather is being thonged, the starting and

finishing are done by threading the ends of the thonging under several stitches on the back of the job, or if the leather is thick enough it may be split so that the ends are hidden.

Step 16: Place the thonged edge of the job on a punching block and using a mallet or hammer, lightly tap the edges, flattening the thonging.

FLORENTINE THONGING

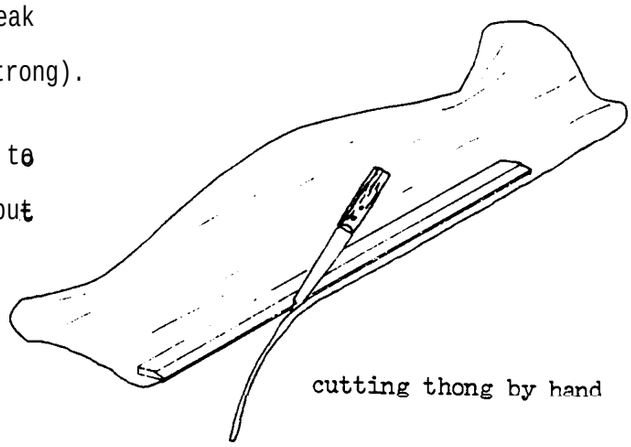
Florentine thong (or Venetian thong or Venetian spiral) is a wide, thin thong used to thong the edges of book covers, wallets, albums and desk pads.

Because of the fact that this type of thong has such little use, it is rarely sold in handcraft stores and leathercraftsmen are forced to make their own. There are two ways of cutting the thong:

1. By cutting strips of the required width from Kidskin 'skiver'.

   (Kidskin skiver is the grain split of a kid skin. Ordinary skiver is the grain split of a sheepskin. Ordinary skiver is not used because it is very weak whereas Kidskin skiver is very strong).

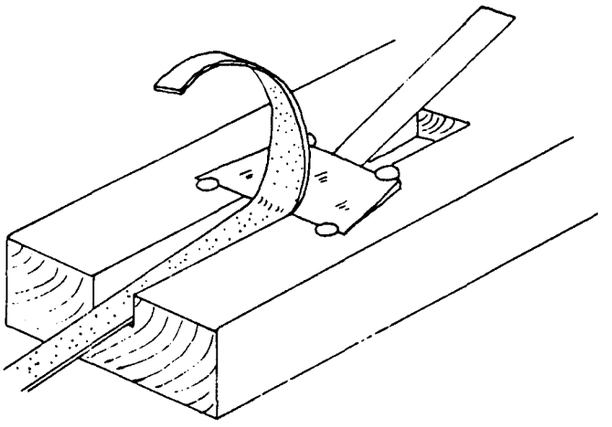
   NOTE that the term skiver refers to the grain split of a sheepskin, but special skivers (such as Kidskin skivers) can be cut from any leather. The thongs are cut from the kidskin skiver with the aid of a long straight edge and a knife (shown).



cutting thong by hand

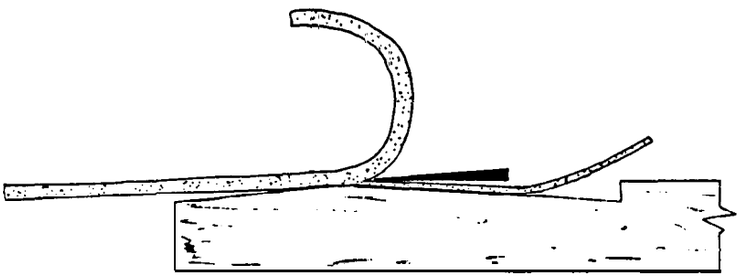
2. By splitting a wide thong to the required thickness.

Kangaroo hide thongs in many different widths are readily available. However they are much too thick and it is necessary to split them down to the required thickness by the following method.



Improvised cutter for making Florentine thong.

3. With the aid of a simple improvised splitter such as the one shown. It consists of a sharp steel blade, screwed over a slot in a piece of wood. The method of use and its principle of working are shown. The depth of the slot at the cutting point determines the thickness of the Florentine thong.



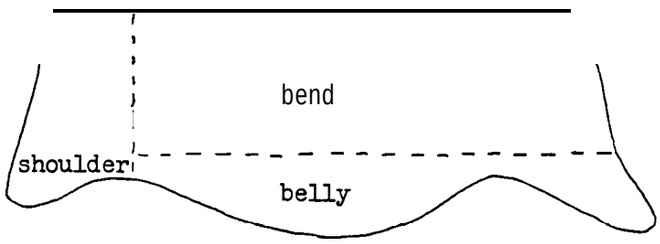
METHOD OF CUTTING THONGS

For all of your leathercraft projects you will be supplied with a length of pre-cut thong. This thong is cut in the tannery on a special machine, which cuts a continuous piece of thong from around the outside edge of a skin.

Some leathercraftsmen prefer to cut their own thongs for special work or from special leathers. For this reason it is important for you to know of the hand

methods of cutting thongs.

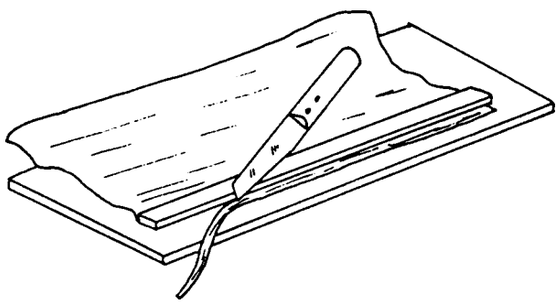
Thongs should be cut from that portion of the skin or side known as the bend or back.



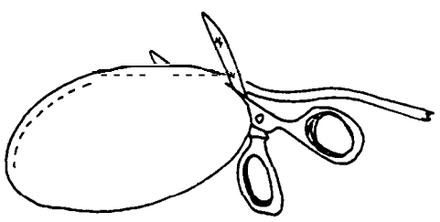
If possible avoid using the spongy belly or shoulder sections which are more elastic than the bend.

<u>The following methods can be used</u>:

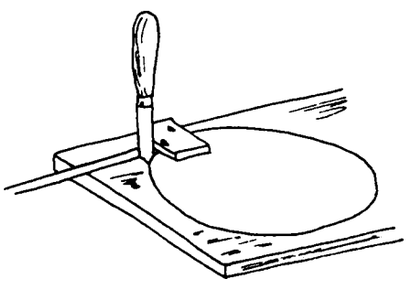
1. Cutting a narrow strip from the edge of a piece of leather with the aid of a knife, straight edge and backing board. Only short thongs can be cut by this method.



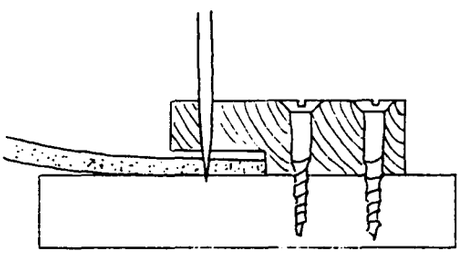
2. Cutting a narrow strip from the edge of a circular piece of leather (a good way to use up scrap) with a pair of scissors or leather shears. After the thong is cut it can be straightened out by stretching it. It is quite difficult to cut a thing of a constant width by this method.



3. A homemade thong cutter can be made from a knife, 2 screws and a small piece of timber as shown. For efficient results



the depth of the rebate in the small piece of timber should be 1/32" greater than the substance (thickness) of the leather being cut. A 'leader' should also be marked and cut on the leather disc before starting to cut.



LEATHER APPLIQUES

An applique is a form of decoration which is applied to the surface of leather or other material.

Leather appliques probably had their origin in the fitting of pockets and pouches to clothing, saddles and other leather goods. It would be natural therefore to close the top of a decorated pocket and use it merely for decoration.

Today leather appliques are used as a form of decoration on book jackets, albums, leather covered box lids, portfolios and writing cases. The leather applique is usually a tooling leather, such as calf or tooling sheep, which has been modelled, stamped, carved or embossed. The leather applique is then attached with an applique braid.

The advantages of this type of decoration are:

1. If the cover of a book is to be tooled, a leather applique makes it possible to construct the jacket from a cheaper, more flexible leather.
2. Leather appliques can be used to add strong contrasts to a cover as well as to hide any imperfections in the jacket leather.

In other cases applique braids can be used for joining leather edge to edge. Thus applique braids have two uses -

a) decoration

b) joining leather

There are many different types of applique braids including the stairstep, chain, split thong, hair braid, straight S type and circular S type using 1, 2, 3, 4 or 5 thongs. Added effect can be achieved by using different coloured thongs and in some cases by using either rawhide, (untanned hide), catgut (twisted intestines of sheep, horse or ass), or horsehair strands instead of thong for the braid. Some of these types are shown on the following page.

BRIEF HISTORY OF APPLIQUE BRAIDING

After man had leanred to clothe himself crudely in the skins of animals, he tried to find a method of joining pieces of skin together. It was natural therefore that he cut narrow strips of skin to join other pieces of skin together. This is probably the origin of the leather thong.

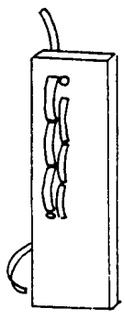
As time passed he learned to use thongs to sew his garments together, to secure heads to his tools and weapons, to make ropes, carrying handles, buttons, buckles, hinges and other fastenings.

Of the many ancient races who developed the use of leather thongs, greatest credit must be given to the Moors or Arabs, who crossed the Straits of Gibraltar from North Africa and invaded Spain in the 8th century. They were excellent leathercraftsmen, having learnt their art from the ancient Phoenicians, who invaded North Africa, probably in the year 1600 B.C. On entering Spain they established many leathercraft centres, where harness making, thonging and braiding reached a standard never before seen. Names such as Cordovan, Morrocco, Spanish edge lacing (now more commonly known as buttonhole stitch thonging), are still in common use today.

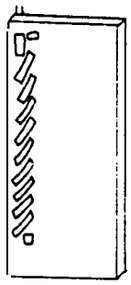
Eventually the Arabs were driven from Spain. However they left behind them the techniques used in making their elaborate braiding and thong work. These techniques were taken to all parts of the world by the Spanish, who apart from being expert horsemen, were great explorers and sailors. The Mexican vaqueoros learnt how to braid and thong from their Spanish invaders and became excellent trenzadors (or braiders). The very best trenzadors became known as charros, to whom the horse and its decoration was the primary object of life.

The American cowboys, then learnt how to braid from the trenzadors and charros and to vary their techniques, so that there are hundreds of different methods of thonging, braiding and plaiting.

SOME EXAMPLES OF APPLIQUE BRAIDS

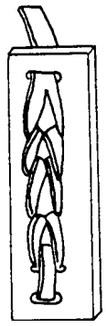


Chain

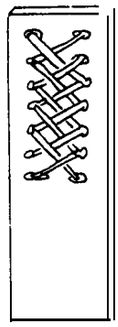


Stairstep

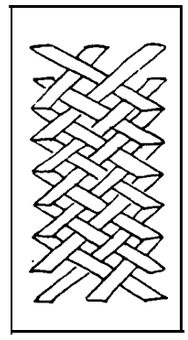
Split thong applique of of two thongs



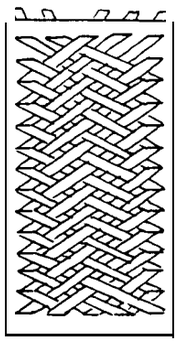
split Thong



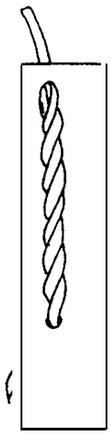
'S' type



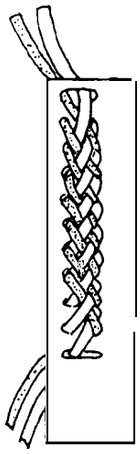
Applique of of three thongs



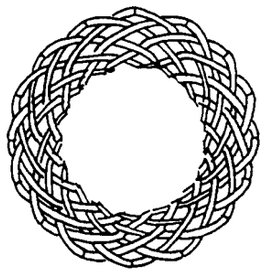
Five thongs



Stairstep of 1 thong



Two-thong four part applique



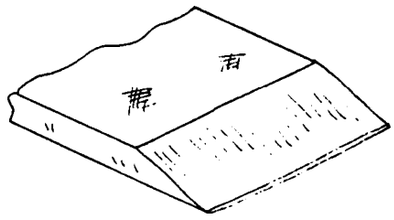
five-thong circle

SKIVING LEATHER

If the edge of a piece of leather is to be folded, bent, sewn or thonged, it is usual to bevel (taper or thin) it, thus making the edge less bulky and more flexible.

This process is called skiving.

If two pieces of thong have to be joined the ends are skived before they are glued.



Skiving can be done with a plain shoemaker's knife cr a "skife" specially designed for the job.

Skiving Operations

Step 1: Place the leather on a cutting board so that the edge to be skived is along the edge of the board.

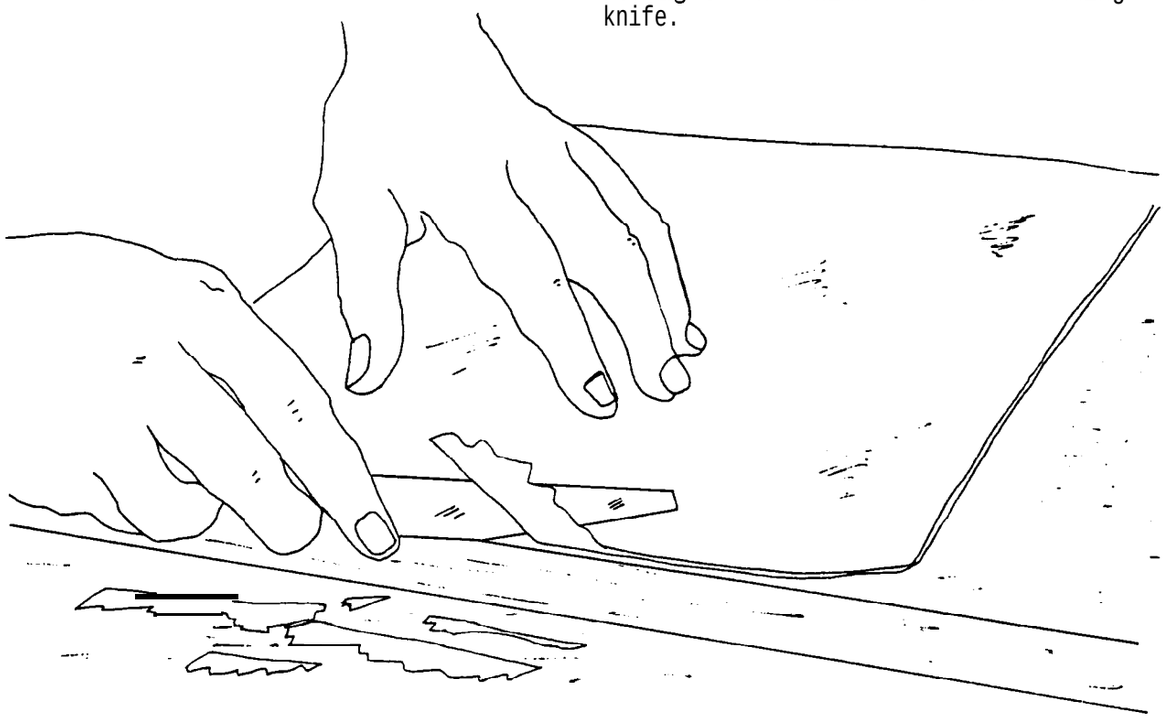
Step 2: Position the leather and board in such a way so that you will be cutting away from your body and so that both hands are always behind the cutting edge of the knife.

Step 3: Hold the knife on the edge of the leather.

Step 4: Push the knife away from you with a backwards and forwards slicing action to make the tapered edge about ½" back from the edge.

The final edge thickness will be determined by the job in hand. For joining by splicing the edge will be taken down to paper thickness.

Skiving leather with a leather cutting knife.



Starting a Thong

When starting and finishing thonging it is necessaryto skive about 1" from the end of the thonging so that the edge of the job does not become too thick at these positions.

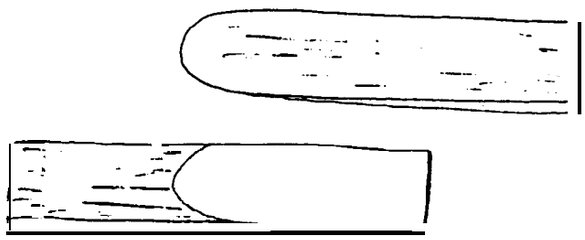
Joining Thongs

Because of the difficulty in using very long lengths of thong, it is necessary on large projects to join on additional pieces as the work progresses. Thongs are joined by splicing.

Splicing Operations

Step 1: Skive the end of the used thong on the grain side about 3/4" back from the end as described in the skiving steps above.

Step 2: Skive the end of the new piece of thong on the flesh side 3/4" back from the end.



Skiving the ends of thong.

Step 3: Apply a thin coat of glue to both skived surfaces and press the ends firmly together between your fingers.

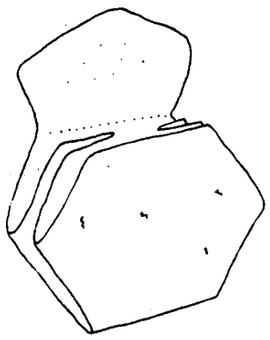
GUSSETS

In leathercraft a gusset is a folding or expanding section which adds depth and spaciousness to an article.

There are many different types of designs of gussets.

Here are some sketches, applications and uses of a few common types of gussets. It must be understood, however, that for special purposes there are many other types and many variations of the ones shown here.

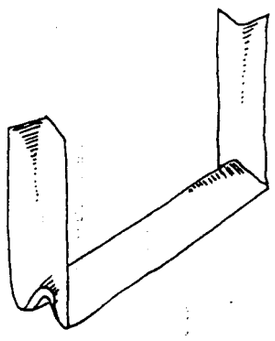
1. Folded End Gusset



Application: Where the front, back and gussets of the article are made from the one piece of leather. The article will automatically fold flat when not in use.

Uses: Coin purses, handbags, shoppers.

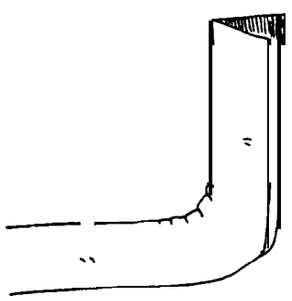
2. Folded Continuous Gusset



Application: For large articles which are made to automatically fold flat when empty. They also give a uniform space inside a pocket.

Uses: Brief cases, pockets for briefcases, under-arm bags, clutch bags, portfolios.

3* Moulded Gussets



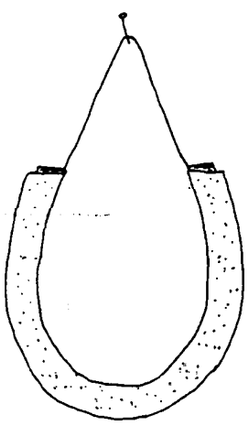
Application: For small articles where the gusset is made of thin leather.

Uses: Purses, small circular sling bags.

Methods of Making Gussets

A) String Method

In this method the moistened snd mellowed gusset is folded along its length with the grain side in. A loop of thin, strong string



is tied to a nail on the wall and fits in the fold in the leather.

The gusset is then moulded by pulling on the outer edge with both hands to form the required shape.

The string is then removed and the gusset allowed to dry under light pressure.

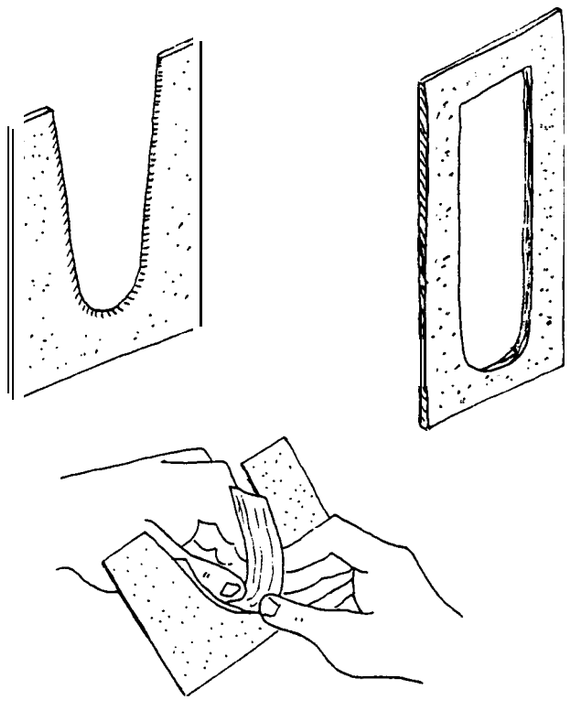
This method is only suitable for single gussets. Where an accurate gusset or a number of similar gussets are required it is better to use the following method.

B) Sheetmetal Method

In this method a piece of sheetmetal such as Brass, Zinc or Copper or even a piece of stiff boxboard is used to make a mould.

A U-shaped opening is cut in the sheetmetal to suit the gusset required. The opening is open topped or close topped for long narrow gussets.

By using this method it is possible to accurately make a number of similar gussets, unobtainable with the string method.

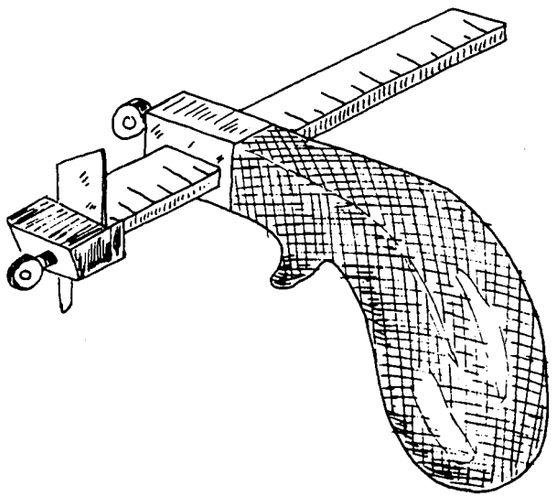


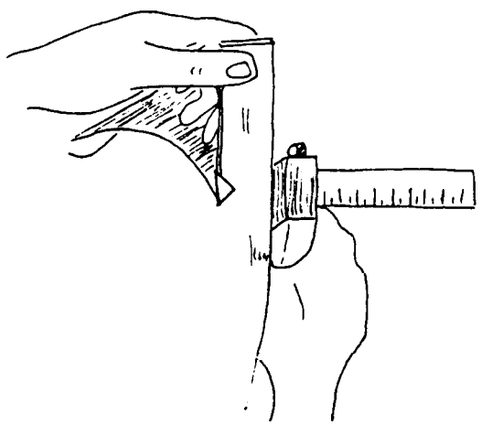
STRAP AND BELT CUTTING

The cutting of leather straps to make belts, carrying straps, tide thongs or harness is done by hand, with the aid of a draw gauge or plough gauge as shown.

The gauges are adjustable and will effectively cut thick straps from ½" to 2½" wide. A plough gauge was the tool used to cut the strap for your belt.

The method of using the draw guage is shown.





LEATHER USED FOR BELTS

A) Thickness

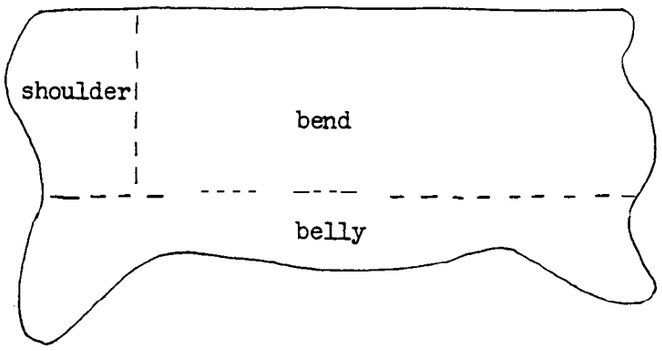
2.0 mm. is a suitable thickness for belts, being an excellent compromise between flexibility and strength. It is also a suitable thickness for saddle stamp decoration.

B) Flesh Side Finish

In leather belt construction, it is important that the natural roughness or hard grain on the flesh or inside of a belt is finished in some manner. This allows the belt to slide easily in the trouser loops and makes the centering of the buckle a quick operation.

C) Cutting Leather for Belts

Study the drawing of the side (or half skin), on the following page. You will notice that the side is divided into three main parts - the bend, the shoulder and the belly.



For belt construction it is advisable to cut the straps from the bend, which is the least elastic part of the skin.

The shoulder and belly parts of the skin are very elastic. This is to be expected because it is these parts of the skin, which are continually being stretched as the living beast moves about. For this reason the belly and shoulder pieces are best used for gussets, linings, pockets, etc. and are not very suitable for belts.

FOLDING HEAVY LEATHERS

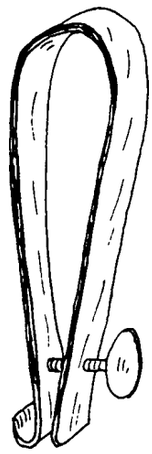
There are many instances in leathercraft where it is necessary to fold or bend a heavy leather. Chrome tanned leathers, because of their flexibility are very easy to bend whereas vegetable tanned leathers, such as the printed hide, for the tomahawk sheath, are much firmer and are difficult to bend. Before bending or folding a heavy vegetable tanned leather, it is necessary therefore to form a groove along the folding line. The groove can be formed with one of the following tools .

1. Racers. (Sometimes spelt Races).

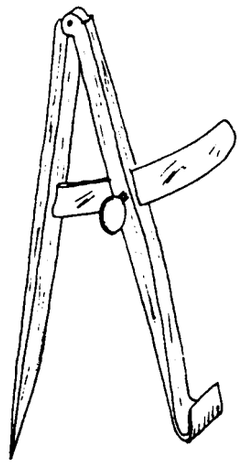
Drawings on next page.

single

double



screw



compass racer or patent leather compasses

American racer or rampart gouger

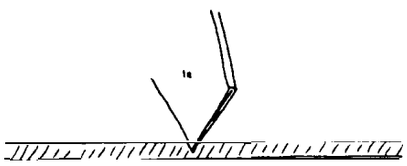
Basically these tools consist of a flat piece of steel bent round at the end to form a hook, the edge being sharpened to cut a groove. The American Racer is a little different in that it is adjustable for the depth of cut.

The double racer is an improvement on the single racer in that two different width grooves can be cut. The screw racer is used to form a groove parallel to an edge. The compass racer is used for cutting a circular groove but if the pointed leg is slightly rounded off it may be used as a screw race.

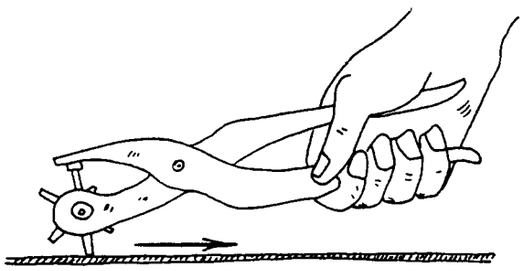
There are a number of other tools which can be used for cutting grooves on leather. Even though they are not specifically designed for this purpose (as are the racer) they will give a satisfactory result if used carefully.

1. "Masonite" groover. This tool has to be specifically designed for use on hardboards but is also excellent for grooving leather, which has a somewhat similar composition.

2. Knife. A knife can be used to steep pare a V-shaped groove half way through the thickness of the leather. Great care must be taken to see that the knife does not penetrate to the flesh side.



3. Six-way Punch. By drawing the sharp tube of a six-way punch across the flesh side of a piece of moistened leather (shown) a groove can deformed. However the punch does tend to "clog" very quickly by this method.

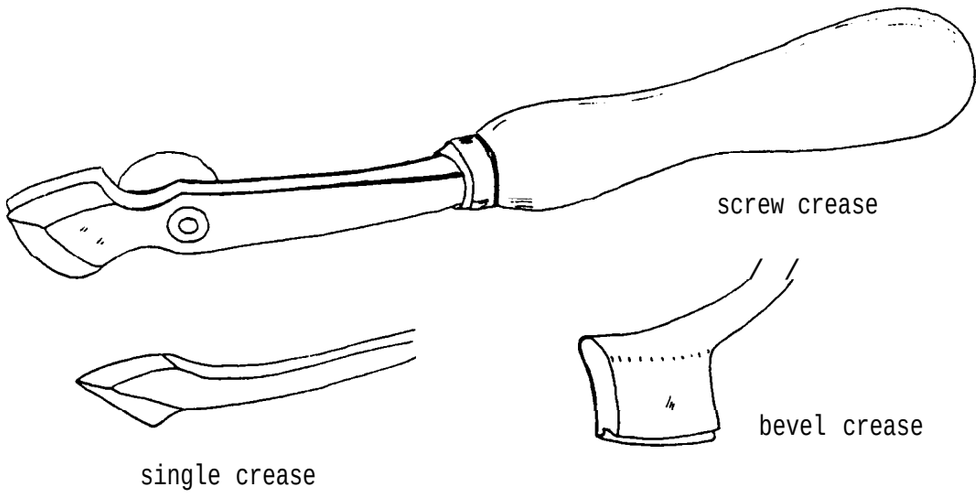


EDGE CREASING TOOLS

Edge creases (sometimes spelt creasers) are tools used for finishing the edges of leather. They compress the leather edge giving a slightly darker decorative line as well as making the edge hard and resistant to water.

Hot creasing is done by heating the crease before applying it to the leather. The temperature of the crease depends upon the type of finish applied to the leather. The best rule to follow is to test the heated crease on a similar but scrap piece of leather, before using it on your job. If the crease is too hot it will burn the leather and nothing will remove the unsightly mark. If too cold a poor crease mark will result.

The three common types of creases are shown following.

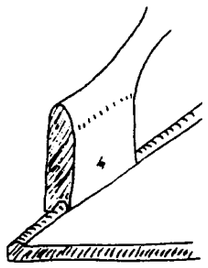


The Screw Crease is the most versatile of the three creases, because it can be used for creasing two lines as well as creasing one line at a constant distance from the edge. For this operation one of the jaws regulates the distance of the crease line from the outer edge of the leather.

The Bevel Crease is used for creasing a line at a fixed distance from the outer edge of the leather. In this type of crease, the fence (which regulates the distance of the crease line from the outer edge of the leather) projects a little below the edge which does the creasing.

The Single Crease is used for creasing a line in conjunction with a straight edge. Not having a fence, it can be used at any distance from the edge.

Creases can be obtained in a range of sizes e.g. (no. 1, 2, 3, 4).



SPLITTING SKINS AND HIDES

Reasons for Splitting

1. To produce a number of thin skins from a single thick one.
2. To produce a skin of an even thickness, suitable for shoe uppers, upholstery and craftwork.

Method of Splitting

Splitting is done on a machine with a horizontal blade, against which the leather is forced by rollers. The machine is so accurate that the splits do not vary more than 1/500 of an inch.

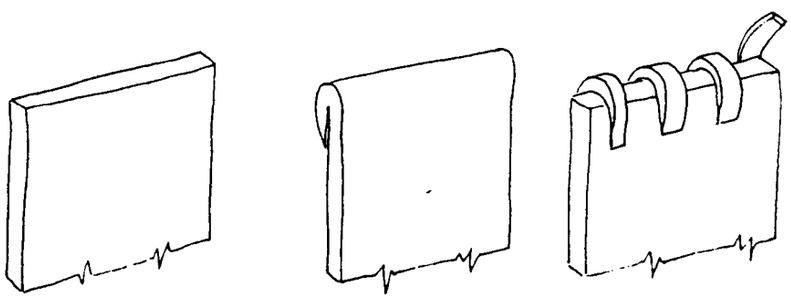
If a skin is split into 2 pieces in thickness, one split is known as the 'grain split' and the other as the 'flesh split'.

The grain split is the one taken from the hair or top side of the skin, is the strongest and is used for linings and bookbinding.

The flesh split is the one taken from the flesh or underside of the skin. It is sometimes sueded. (Suede is a type of finish made by buffing the leather to produce the nap or fine pile characteristic of it, e.g. suede shoes). Flesh splits are usually oil tanned and used to make chamois (car washing) leather.

The Edge Treatment of 'Cut Edge' Work

The construction of any leathercraft project, always involves finishing the edges of the leather in some manner.



cut edge folded thonged

The edges maybe left plain (called 'cut edge work'), thonged or folded.

Cut edged articles, such as your belt, should only be made from -

a) vegetable tanned leathers

b) firm, close grained leathers, such as calf, pig, morocco or hide.

Chrome tanned leather is not suitable for cut edge work, because, being water resistant, its fibres are springy and refuse to lie down smoothly when being polished.

Cut edge work can be finished as follows: -

a) by dampening the edge with water or a water soluble analine dye; rubbing with a wad of cotton or linen cloth; waxing and hot creasing. (This technique will be dealt with in detail later).

b) with an edge enamel (or casing compound). This sets the fibres in one application and dries to a high gloss. It maybe natural (neutral.) or coloured.

c) with a waterproof edge enamel. This technique is used on the edges of watch straps to help prevent discoloration from perspiration.

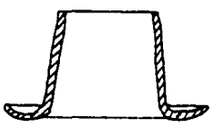
LEATHER FASTENERS

Eyelets

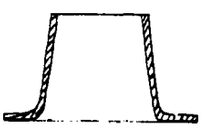
These are a type of rivet in the form of a small tube with a rim.

Uses: 1. Fastening metal fittings to leather (key case).

2. To reinforce holes in belts, shoes, etc.



Round Rim

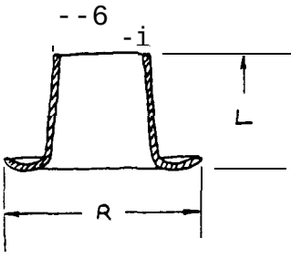


Flat Rim

There are two main types of eyelets - round rim and flat rim.

Eyelets are made from Brass, Aluminium and Zinc, having either a gilt, white plated, japanned or coloured enamel finish.

The size of an eyelet is determined by 3 measurements - rim diameter (R)
barrel diameter (B)
length (L)
of which there are hundreds of combinations.



Eyelets are fixed with an eyelet punch, die and hammer or with a plier type eyelet punch.

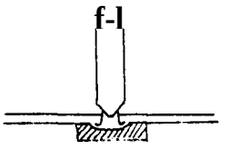
Fixing Eyelets

Eyelets are fixed in holes punched in the leather as follows:

Step 1: Mark out the position for the eyelet and punch a hole equal to the size of the eyelet.

Step 2: Push the eyelet through this hole snd through any other materials being fixed with the eyelet.

Step 3: Place the flanged side of the eyelet on a firm surface. Position the eyelet punch on the straight side of the eyelet and tap it with a hammer. The eyelet is then attached to the leather.



An eyelet ready for fixing.

An eyelet punch.

Rivets

Rivets are used in leathercraft to make permanent joints. Once they are fixed in position they are almost impossible to remove without damaging the leather. For this reason care must be taken in their fixing.

Types: The 3 main types are: -

1. Bifurcated
2. Speedy
3* Solid

1. Bifurcated Rivet (also known as split or two forked rivet).

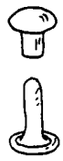
It can be obtained with a round or flat head and is usually nickel plated. Various lengths and gauges (diameters) can besought. If the rivet is too long for the work it is difficult to bend close to the surface of the leather and poor results are obtained. The main disadvantage of this type of rivet is that when set it leaves two unsightly prongs on the reverse side of the leather.

Bifurcated Rivets

Round Flat

2. Speedy Rivet. (Also known as Tubular or Rapid Rivet).

This type of rivet is made in two pieces, is easy to use and looks neat on both sides of the leather. It is available in several lengths to suit different thicknesses of leather and the correct length must be used, otherwise it will not close tightly and neatly on the leather surface.



Speedy Rivet

3* Solid Rivet

It is made from soft brass, aluminium or copper. It is very strong and is used for attaching locks, catches snd other metal fittings to leathercraft articles.

Solid Rivet

It can be obtained in different lengths and gauges.

Buying Rivets: When buying rivets you must specify the quality, type, length, gauge (denoted by the sign # or g.) and type of finish.

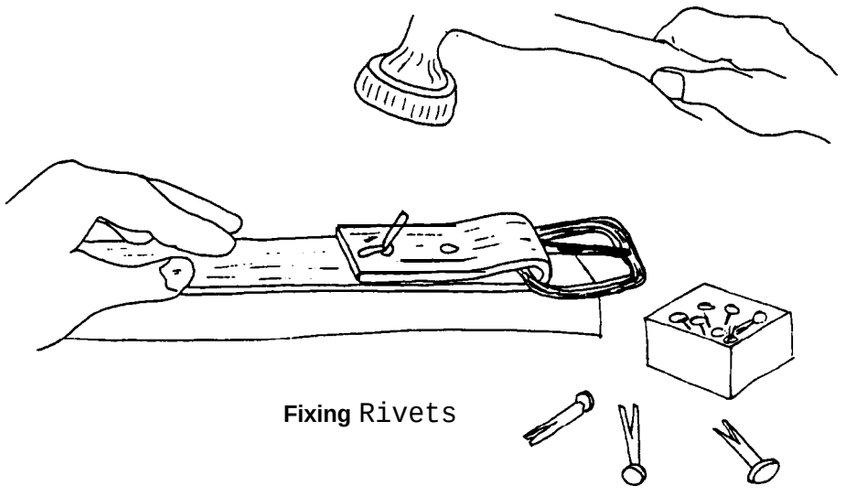
e.g. 1 gross, ¼" x 9# nickel plated, flat bifurcated rivets.

1 lb. ¼" x 8# gilt, round head bifurcated rivets.

1 doz., ½" x 8g. copper, flat headed rivets.

Fixing Rivets

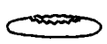
Rivets are fixed in position in previously punched holes in the leather, using a mallet or hammer.



Fixing Rivets

Press Studs

These are a semi-permanent type of fastener used on key cases, brush cases, wallets, purses, belts and small handbags.

cap unit	stud unit
	
	

A press stud set consists of 4 parts.

The cap unit consists of the cap and cap inner.

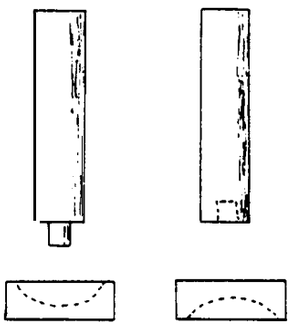
The stud unit consists of the stud and stud inner.

Press studs are obtainable in different sizes, depending upon the size of the cap.

The size of the cap is given in lines, such as 10 line, 16 line, 18 line, or 24 line. One line equals 1/40".

Another simpler method of sizing eyelets is by numbering the common sizes from 1 to 6.

Fixing Press Studs



Press studs are fixed to articles having flap type openings, so that one piece of leather is in front of the other, where the press stud is fitted.

The finishing of the press stud can only be done with the aid of two press stud punches and a die.

One punch is pointed and together with the hollow die is used to set the cap unit.

The other punch is hollow ended and together with the die turned upside down, is used to set the stud unit.

Different sized press studs require different sized punches and dies.

Fixing Press Studs

Press studs are fixed to articles having flap-type openings so that one piece of leather is in front of the other where the press stud is fitted as follows:

Step 1: Mark out the position of the cap unit in the front piece of leather.

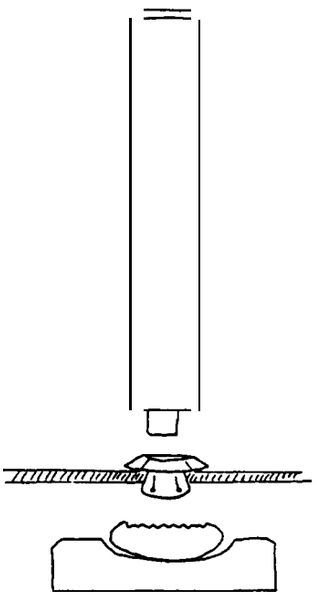
Step 2: Punch a hole the size of the cap inner on this mark.

Step 3: Place the cap inside down in the cap support which should be placed on a solid surface, such as a table top, above the table leg.

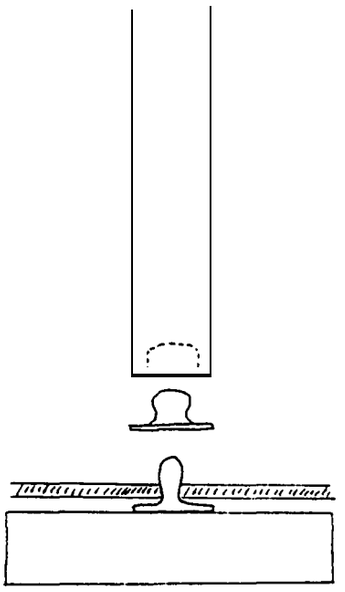
Step 4: Place the cap inner over the point of the pointed punch of the press stud set of tools.

Step 5: Push the cap inner, held on the end of the punch, through the hole in the leather from the inside of the leather flap.

Step 6: Place the end of the cap inner that protrudes through the other side of the leather into the cap and strike the punch lightly with a hammer. This fixes the cap unit.



fixing cap unit



fixing stud unit

Step 7: Mark out the position of the hole for the stud inner by pressing the cap unit into the second piece of leather. This makes an impression in the correct position. It may also be marked out using a template sheet.

Step 8: Punch a hole of the correct size for the stud inner in this position.

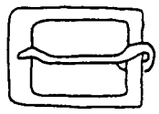
Step 9: Push the stud inner through this hole from the underside of the leather snd then place the stud on the end of the stud inner.

Step 10: Rest the underside of the stud inner on a firm surface, place the hollow punch of the press stud tool set over the stud and tap it with a hammer. This fixes the stud unit. The cap and stud units may now be pressed together.

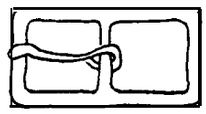
Buckles

Buckles are a semi-permanent type of fastening used on brief cases, camera cases, belts, brush cases, harness, etc.

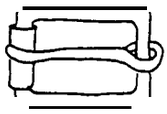
The two main types are the single buckle and the double-buckle. Either can be obtained with or without rollers.



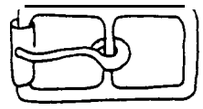
Single Buckle



Double Buckle



Single Buckle (with roller)



Double Buckle (with roller)

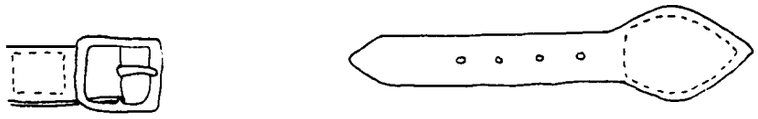
Buckles are usually made of steel or brass. The steel ones can be brass, nickel or chrome plated.

Fancy buckle shapes are manufactured for belts, but in the main they are variations of the single buckle type.

The size of a buckle is the same as the strap it is made to fit Common standard sizes are ½", 5/8", 3/4", 1", 1¼", 1½", 2".

Fixing Buckles

Buckles are fixed to leather straps.

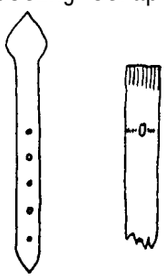


A Buckle, showing the method of attaching the strap.

Step 1: Select a buckle to suit the size of straps being used.

Step 2: Punch a hole in the buckle strap for the pin of the buckle.

Step 3: Punch holes in the adjusting strap for the buckle.



skived end

hole for bucklepin

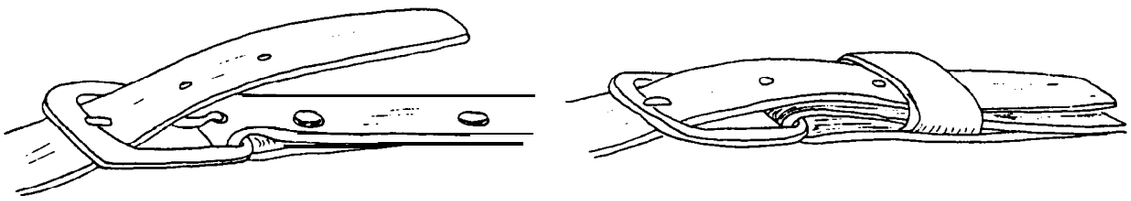
Step 4: Skive the short end of the strap so that it can be folded around the buckle centre.

Step 5: Fold this skived end around the buckle centre with the pin through the hole and glue it in position.

Step 6: Sew this end in position.

Strap Keepers

In the construction of any single buckled strap it is necessary to use a keeper to hold down the loose end of the strap as shown.

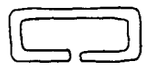


The use of a double buckle does away with the need for a keeper if the loose end of the strap is short, but if it is long (as found on shoulder straps, harness and framed overnight bags) it is necessary to use a keeper with this type of buckle.

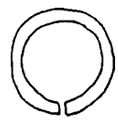
Keepers can be made from leather (as found on your belt) or bent from wire (called rings). The 4 common types of ring keepers are shown on next page.

D-ring

square



rectangular



round

Of these the D ring is the most popular for shoulder straps and harness while the rectangular ring is used for belt and watch straps. The square and round rings are sometimes used for shoulder straps, sling handles and bridles.

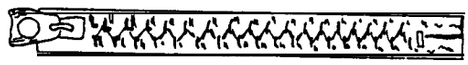
The size of a ring keeper is governed (like a buckle) by the size of strap it is made to fit. e.g. a 3/4" D ring fits neatly on a 3/4" strap.

Zip Fasteners

There are hundreds of different types of zippers. They vary in colour, size, type of closing piece (brass or nylon) and length.

For small leathercraft jobs a nylon zipper with brown side tapes is most suitable. For a wallet it is most important to select a zipper with a thin closing piece to prevent making the wallet too bulky.

Zippers are also used in leathercraft on brief cases; overnight bags; handbags, coin purses; stationery, note and pyjama cases.



For stationery cases, parkas, etc. zippers up to 36" long are required.

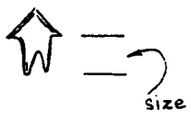
Findings and Grindery

You have just finished reading about eyelets, buckles, rivets, d-rings, etc. All metal items, and many more, which are used in the leather goods and saddlery trades, are known as leather findings or grindery. In the findings or grindery section of a leather store therefore, you would expect to find the tools and materials

(except leather) used by the leathercraftsman. Some other more common findings are shown below.

Pyramid Head Rivets

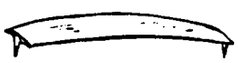
These are a decorative type of rivet, similar to the bifurcated (or split) rivet, used on such items as dog collars, belts, straps, saddles and other fancy goods. They may be used for holding parts together, but generally are used only as a form of decoration.



They are made from nickel plated steel and sold by the dozen or gross. Their size is determined by the length of the shank. common sizes are 3/16", ¼". 3/8".

Dog Collar Plates

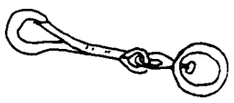
A decorative plate, specially designed for dog collars, on which the dog's name is engraved. They are made from nickel plated steel to prevent rusting and are slightly curved to fit the curved shape of the collar. The two prongs are used to attach the plate to the collar.



They are sold by the dozen or by the gross. Common sizes are 2" x ½", 1 3/4" X 3/8", 1½" X 3/8", 1½" X 5/16", 1 1/8" x ¼".

Swivels

These can be purchased in the findings section of a leathercraft store in sizes such as 3/8", ½" and 5/8".



Naturally enough the large swivels are used on heavy leashes for holding the biggest dogs and vice versa.

Swivels are made from steel and are nickel plated to prevent rusting.

Apart from being used on dog leashes they are used on toddlers' harnesses, scout belts (as a knife holder) and for attaching identification tags to articles (e.g. mail bags, etc.).

THE DESIGN AND DECORATION OF ARTICLES MADE FROM LEATHER

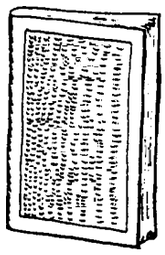
To design an article which is entirely satisfactory for its intended use, which has a pleasing shape and which is attractively decorated is a difficult job, and one which can give a craftsman a great deal of personal satisfaction. Experts in the art of designing and decorating leathercraft articles follow an established procedure. The following procedure should help you in your initial attempts at designing and decorating.

Designing the Article

1. Using the natural grain of leather.

One of the easiest methods of decoration is to make the project from a leather which has an interesting grain (either natural or an imitation print). For example, the spectacles case shown is made from lizard skin. The grain of this leather is very attractive and doesn't need embellishing with other methods of decoration such as carving, stamping or tooling. Commercially made leather goods such as brief cases, shoes, overnight bags, handbags, etc., usually rely on this type of decoration.

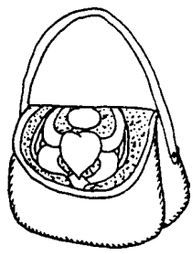
2. Straight Line Tooling



This is a sample method of decoration which requires the use of very few tools. It is usually applied to smooth grained leathers such as cattle hide, calf and sheep. It can be further embellished with stippling

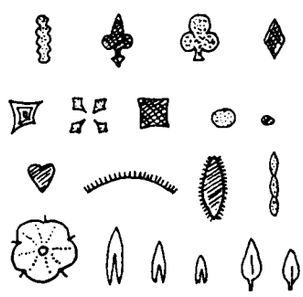
or stamping. The book cover shown is a simple example of straight line tooling and stamping.

3* Carving and Stamping



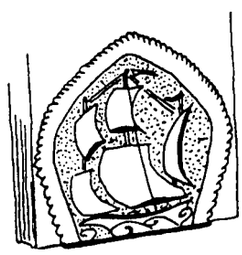
This method of decoration is applied to smooth grained leathers by cutting the leather with a swivel knife and embellishing around the carved lines with special saddle stamps. This method has been developed in Mexico and America where it is still the most popular form of decorating leather articles. The designs are based on floral arrangements of flowers, petals, leaves, etc., and many books are available giving typical. examples. The carved purse shown is an example of this type of decoration.

It is possible to buy saddle stamps of many different sizes and shapes. These are used by the expert leatherworker or leathercraftsman to decorate a project or model. They can be used to stamp motifs (the single unit of a design) or to make all over patterns or borders.



Some commercial saddle stamp designs.

4. Embossing and Modelling

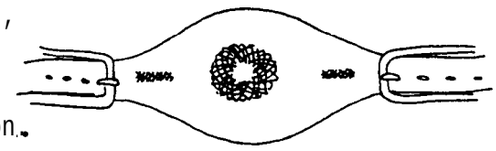


Of all the methods of decoration, embossing is the most difficult. It is usually done on thin, smooth grained leathers such as calf or sheep. The designs that can be embossed or flat modelled are unlimited, though usually they consist of scenes depicting flora, fauna, human or landscapes.

The nautical scene on the bookend on the previous page is a typical example of modelled and embossed work.

5. Braiding

Although braiding is usually used in making circular objects such as whips, riding crops, leashes, etc. , it can be also used on flat objects such as belts, book covers, saddlers, etc. as a form of decoration. Braiding on flat surfaces is known as Applique braiding. The belt shown is an example of this type of decoration.



TEMPLATES

In the construction of any leathercraft project, it is necessary to set out accurately the shapes of the pieces. This is sometimes done straight onto the leather, but because leather is easily damaged or marked, considerable care must be taken to keep it free from pencil marks or scratches, which spoil the appearance of the finished article. In addition, many of the shapes used are irregular, making them difficult to mark out and repeat.

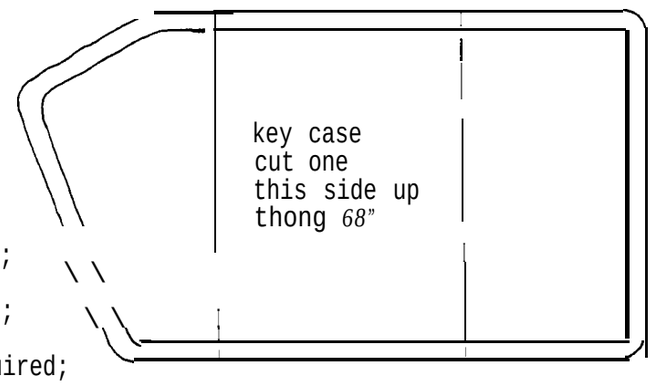
For this reason it is better to make a drawing of the shape of the project on a piece of paper, cardboard, strawboard or thin sheet metal; cutting out this shape (now called a template) and using it to mark out the shape of the project directly onto the leather.

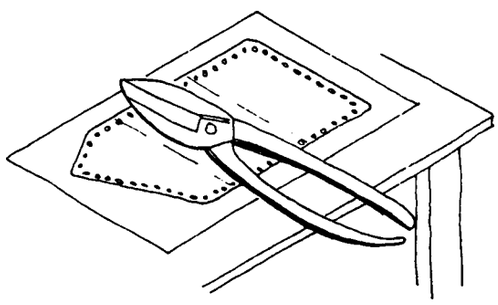
Templates then, are patterns used to set out work, to aid in cutting out and to mark holes and other details with accuracy. Because templates can be easily arranged on the surface of a piece of leather, they assist in cutting the material economically.

If only a few models are to be made, the templates can be made from stiff paper or thin cardboard, but if the template is to be used for many projects it is better to make it from a more durable material such as strawboard, thin plywood or sheet metal.

Steps in Making a Template

1. Select a suitable material for the template and mark on it the shape required. This is usually done with the aid of drawing instruments to measurements -
   a) taken from a plan in a book;
   b) taken from a similar model;
   c) taken from a pattern or design you have made up yourself.
2. Mark the position of any holes such as -
   a) thonging holes;
   b) stitching holes;
   c) press stud, eyelet, rivet, grommet or buckle holes.
3. Punch any holes.
4. Cut the template to shape.
5. Label the template with the following information:
   a) name of model or project;
   b) part of model or project;
   c) the number of parts required;
   d) the length of thong required;
   e) any other special information, such as the side of the template to be uppermost when marking out.





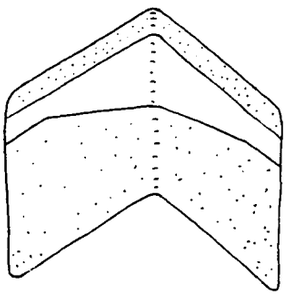
NOTE : In marking out and cutting of metal

templates, sheet metal working tools are necessary, e.g. the holes for the thonging are drilled.

The shape of the template is cut with the aid of a pair of snips.

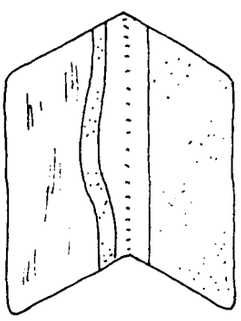
DESIGNING A WALLET

A wallet is a very useful article used by many people for holding such things as notes, paper money, cards, licences, cheque books and other credentials. For this reason it is one of the most popular of all leathercraft projects.



Should you wish to design and make a wallet at any time, it is important to know of the main types which are in common use.

The two most common basic types of wallets are -



1. Full Width Pocket Type

   This type has the pocket or pockets running the full width of the wallet. Any paper money placed in the wallet folds with it. Americans call this type a 'bill fold'.

2. Half Width Pocket Type

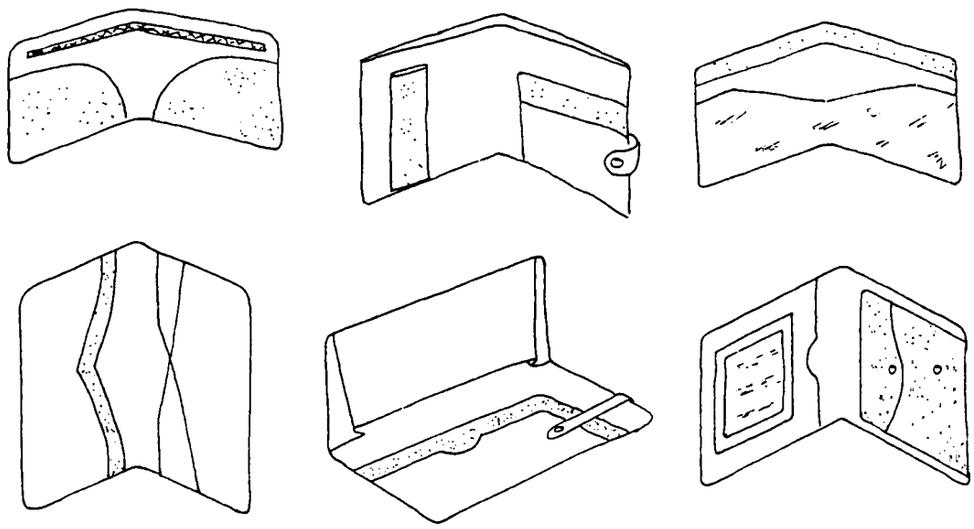
   This type is usually slightly larger than the full width pocket type and is fitted with a number of pockets which open into the centre of the wallet. Paper money and notes remain flat at all times. Americans call this type a 'pocket secretary?.

Naturally many changes, variations and additions can be made to the above two

types including the fitting of zippers, pockets - either tight, (non-expanding) or gusseted (pleated), flaps, picture and ticket windows.

Many other effects can be obtained depending upon the number and size of the pockets, the type and thickness of leather used, the lining material (skiver or fabric) and the method of decoration (thonged or sewn, modelled, stained, stamped, carved, etc.).

Shown below are some examples of different wallets.



Leathers Suitable for Modelling

Not all leathers are entirely suitable for moulding. Any leather which has been vegetable tanned, or has similar characteristics! is the best to use for moulding.

Such leathers as calf, roan (sheep skin), morocco, pig or kid (young goat

skin) are ideal for moulded gussets, because these leathers are usually very thin and pliable. Obviously the thinner and more pliable the leather, the smaller the curve around which it is possible to mould the gusset. For easy moulding the gusset leather should be cut from the belly section of the skin (this being the most pliable).

Before any leather is moulded it must be moistened and allowed to mellow (soften or temper). Heavy leathers require a considerable amount of moisture, but Morocco or pig are very absorbent.

Leathers Suitable for Tooling

Not all leathers are suitable for tooling. Vegetable tanned calf is excellent for tooling, because when it is moistened it readily holds any impression forced upon it. Vegetable tanned calf is therefore known as tooling calf and is used for key cases, wallets and fancy goods.

Calf skin, which has been chrome tanned, cannot be tooled but is excellent for shoe uppers and handbags.

Other leathers, which are suitable for outline tooling are cattle hides, sheep skins, goat skins, kangaroo and wallaby hides, provided they have been vegetable tanned.

Leathers which are unsuitable for outline tooling, because of their rough texture are alligator, lizard, ostrich, hair calf and slink (unborn calf).

Leathers Suitable for Stamping

All tooling calf is vegetable tanned, which makes it excellent for stamping after it has been moistened.

Calf can also be chrome tanned, but it is then unsuitable for stamping. Chrome calf is used for shoe uppers.

Other leathers which are suitable for stamping, are cattle hide, sheep skins, goat skins, kangaroo and wallaby skins - providing they have been vegetable tanned.

Leathers which are unsuitable for stamping, because of their rough texture are alligator, lizard, ostrich, hair calf and slink (unborn calf).

Lining Materials for Leathercraft Projects

1. Suedeen

This is a synthetic (artificially made) material, which has the fine pile or nap characteristic of sueded leather. It is sold by the yard, in rolls 25 yards long and 54 inches wide.

It has a number of advantages over sueded leather.

a) Very strong (as is usual for most synthetic materials).

b) Uniform thickness (unsplit skins vary considerably in thickness).

c) Little cutting waste (due to the length and width of a roll of Suedeen, there is less cutting waste than when cutting from an irregularly shaped skin) .

d) Uniform consistency (the belly section of a skin is more elastic than the back section).

For these reasons Suedeen is now being used as a lining material for wallets, handbags, shoppers, brief cases, etc. It is best attached to the case with a flexible adhesive such as Rubber Solution.

2. Taffeta

This is any type of woven material, made from silk, wool, cotton or a combination of these materials, which is light, thin, of plain texture and possessing a high sheen or gloss that imparts a 'rustle' to it when it is rubbed together.

Originally Taffeta was made from plain silk spun yarn, but nowadays other fabrics are used to make Taffeta.

Because Taffeta is very thin, light and strong, it is used as a lining material

for wallets, purses, handbags, etc. Brown is the most commonly used colour for leathercraft projects.

3 Skiver

A skiver is the grain or top split of a sheepskin. Lightweight skivers (approximately 0.2 to 0.4 mom. thick), which have been dyed, are commonly used as lining materials. Because the strength is not as great as Suedeen or Taffeta, it is necessary to completely glue them to a case with a Rubber Solution. Skivers are used for lining kook jackets, handbags, jewellery boxes, etc.

CLEANING NATURAL LEATHERS

Natural tooling leathers are very sensitive to foreign matter such as pencil markings and finger grease. No matter how slight the soil marks may be, they will mar the final polished finish, whether it is left the natural colour or dyed. It is therefore very important to make sure that your fingers are perfectly clean while tooling a pattern or handling natural leather.

There are several methods of cleaning a natural leather.

Method 1: Finger marks can be removed by an application of tepid water to which has been added some mild white soap or a few drops of clear detergent.

Method 2: For more stubborn stains it is necessary to use a solution of Oxalic Acid and water.

Mixing: Add 1 teaspoonful of Oxalic Acid Crystals (easily obtainable at a chemist or hardware store) to 1 pint of warm water and allow the crystals to dissolve.

Application:

1. Using a half charged cotton wool pad, sponge the surface lightly with the solution.

2. Re-sponge after a few minutes with clean cotton wool and clean water to remove all traces of the acid.

3. Allow to dry slightly and proceed with the dyeing.

Caution:

Do not increase the strength of this solution or the leather may be "burnt". Before dyeing a natural leather it is usual to clean it by one of the above methods immediately after the tooling has been completed.

LEATHER FINISHING

Reasons for Leather Finishing

After shaping and tooling a leather article, a leathercraftsman will use one or more of the many leather finishes. These finishes are applied for:

1. Decoration: to add to the beauty of the leather surface by colouring, printing, and/or polishing.
2. Preservation: to increase the lasting qualities of the leather.

Factory Finishes on Leather

There are many types of leather, many of which are very expensive, because of the scarcity or small size of the animals from which the leather is made. Some of these expensive leathers are crocodile, alligator, pigksin, lizard and ostrich. Cheaper leathers, mostly calf and cowhide often have the grain patterns of these expensive leathers printed on their surface. Some examples of printed leathers are Horn Back Crocodile print, High Gloss Alligator print, Lizard print, Ostrich print, Water Buffalo print, Box Grain print and numerous embossed prints.

Plain grain lacquered leathers are available in a wide range of colours. Nearly all types of leathers are finished with a lacquer to give a glossy surface.

Leathercraft articles may be made from leathers with any of the above finishes, or a natural. (unfinished) surface. They maybe then, coloured and/or polished.

Colouring Materials for Leather

1. Stains, Dyes or Writing Inks.

   These give a definite colour to the leather and last well because the colour penetrates the leather. Some good leather dyes are “Raven Oil” and "Getz" leather dyes.

2. Water or Poster Colours.

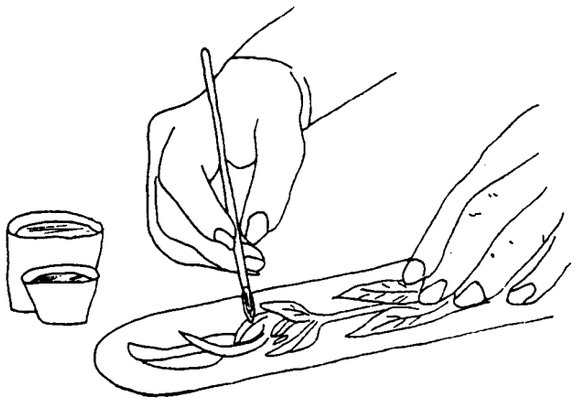
   These colour the leather surface only, and tend to give pale colours. They should not be used thickly otherwise the colour will peel off when dry.

Colouring Operations

Note: All tooling modelling must be completed before colouring.

Step 1: Clean the leather with a clean dry cloth. If there are any grease or finger marks on the leather, rub them off using a moist sponge or cloth and allow the job to dry.

Step 2: Apply the dye, stain, water or poster colour with a small water colour brush, (size about number 6).



Using a small brush to colour leather.

Step 3: Allow the coloured surface to dry. Remove any excess dye by rubbing with a piece of soft dry cloth or cotton wool. If the finished surface appears streaky or if any patches have been missed, go over the entire area a second time.

Before applying colours to your job test them on scrap pieces of leather of the same type as the job.

Polishing Materials for Leather

Leather can be polished (and thus preserved) with any paste wax polish such as linoleum polish. These polishes are applied over colouring materials previously applied. A similar material is clear (non-stain) boot polish. Coloured stain boot polishes may be used to colour and stain large surfaces of leather in one operation. Other leather wax polishes are also available in liquid form.

Wax polish should be applied to the leather article whether the surface has been coloured or left natural.

Polishing Operations

Step 1: Take a small piece of soft cloth about 2" square or a small wad of cotton wool and dip it into the tin of polish.

Step 2: Apply the polish evenly and sparingly to the surface. With a light rubbing action, work the polish into the leather sufficiently to ensure an even surface colouring, but be careful not to make colours run or smudge.

Step 3: Allow the polish to dry for at least 15 minutes.

Step 4: Polish the leather surface using a clean soft rag.

A SUGGESTED COURSE OUTLINE

Leatherwork can be a most interesting subject for study by students of all ages and of both sexes. A special room is not required for the work, nor is expensive specialized equipment necessary. These points make the subject especially suitable for small schools lacking the facilities for industrial arts, yet still wishing to have some form of practical work in their school programme.

For some northern students, especially those enrolled in occupational programmed, various aspects of the course outlined under Allied Theory may be found to be of more value that the intricacies of fine dress leatherwork. Numerous local factors will influence the type of programme presented. The onus is upon the instructor "on the spot" to present as rich and varied a program as his environment demands.

Practical Work

1.	Selecting Leather	suitability
2.	Marking Out	economy
3.	Cutting	teals and care
4.	Templates	making, transferring designs to leather
5.	Adhesives for leather	permanent (glue, cement) semi-permanent (paste)
6.	Making holes in leather	punching, piercing, cutting, slitting, slotting
7.	Thonging	single and double whipstitch, single and double buttonhole stitch, braiding

8. Sewing		running stitch, saddler's stitch, lock stitch

Theory Topics (to be taught in addition to practical operations)

1. History of leather - early uses.
2. Manufacture of leather - commercial and home tanning and rawhide
3. How leather is sold.
4. Storage of leather.
5. Tools for leatherwork.
6. Uses of leather - various leathers - qualities, sizes, weights.
7. Design in leather.
8. The leather industry, careers in leather.

Allied Theory (As time, course and local needs and interests permit.)

1. Trapping
2. Hunting
3. Care of firearms
4. Care of pelts
5. Game laws
6. Selling raw skins, hides, furs.
7. Fur auctions
8. Selection and grading
9. Home tanning
10. Upholstery in leather
11. Leather clothing
12. Fur sewing

Reference for some of the above topics may be found in the

curriculum guide "Practical Programmed in Industrial Arts and Related Activities". A very knowledgeable instructor would be needed to cover these topics satisfactorily, however, experts may be available locally and they are usually most willing to talk to the students about their own particular subjects.

Suggested Projects (listed in approximate order of difficulty)

1.	Bookmark	individual template designs for outline tooling
2.	Combcase	templates, glueing, punching, whipstitch, thonging flat modelling
3.	Utility Knife Shield-	template, sewing (running)
4.	Belt	strap cutting, skiving, slotting, grooving, creasing, fitting buckle
5.	Billfold	sewing (saddlers stitch), flat modelling, double whipstitch thonging
6.	Knife Sheath	- sewing (saddlers with lock) rivetting, flat modelling, slitting
7.	Belt Purse Bullet Pouch (.22)	- press stud fitting, moulded gusset sewing, folded edges, cementing
8.	Key Case	Monograms and ciphers, flat modelled or carved, eyelet fitting, single button-hole thonging
9.	Dog Collar	as for belt, plus D - ring fitting
10.	Dog Leash	braiding
11.	Axe Sheath	riveting, sewing, slitting, buckles
12.	Book Jacket	double buttonhole thonging, braided applique or embossed plaque

Additional Suggested Projects (which include similar operations to above)

Rifle sling, rifle carrying case, wallet, mocassins, carpenter's tool belt, drawstring purses, shoulder/hand bags, writing cases, brief cases.

Reference Books

Leathercraft	Zimmerman	Goodhert - Wilcox	$2.85
General Leathercraft	Cherry	McKnight - McKnight	$2.00
Basic Leathercraft	McCoy	Stock - Vaughn	$2.00