



Back to Basics: A Framework for Leather Manufacture

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Pre-finishing and finishing: Part 1

Buffing

Overview

Buffing is a pre-finishing operation designed to ready the leather surface for the application of finishing products, and to determine specific appearance as well as certain surface characteristics. It is a process of abrasion to refine the grain or to remove part of it. The flesh side of leather may also be buffed, cleaning the flesh and helping to achieve uniform substance. Historically, experienced leather workers were needed to manually present the leather pieces to abrasive wheels. Modern methods use complex rotary machines which can produce precise results. Only limited operator skill and experience is required to feed such machines but extensive know-how is needed to set their work parameters to produce the desired results.

Objectives and outcome

Buffing the grain side of leather is an operation to prepare it for the application of finishes. Light buffing (or snuffing) leaves the grain more or less intact but tends to refine it. Surface blemishes may disappear depending on the degree of buffing. Heavy buffing removes part of the grain and produces the surface for corrected grain finish. A more or less fine nap can also be achieved, resulting in the sueded finish.

Buffing the flesh side has the purpose of cleaning and smoothing the flesh. Partly loose particles are removed. Final substance will be more uniform. Suede leather may also be produced depending upon the grit of the abrasive papers used.

Buffing may cause modification of some intrinsic properties of the leather to a greater or lesser extent including:

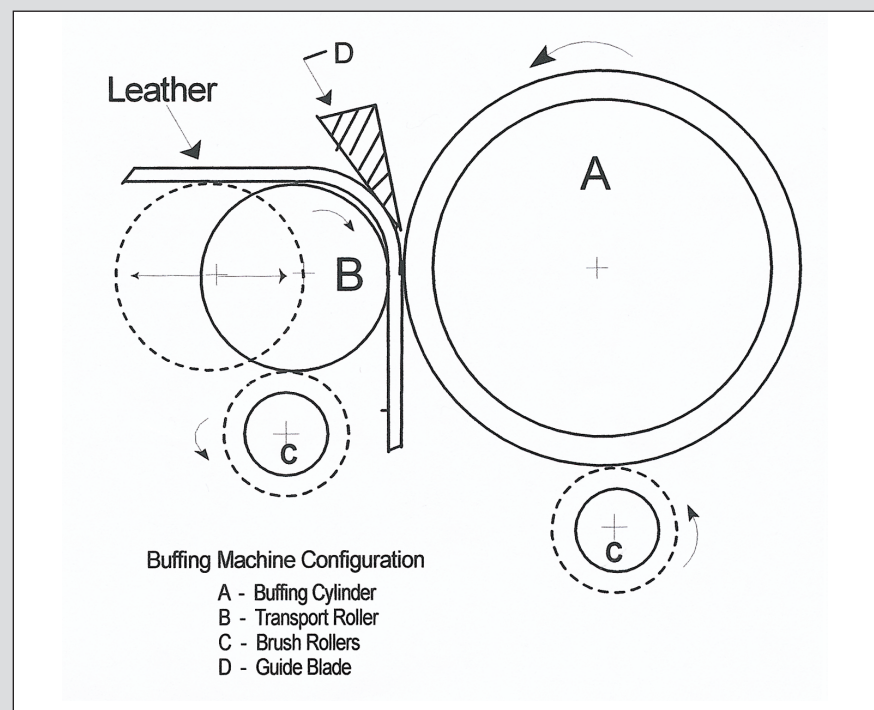
- A setting effect due to the action of the abrasive grain upon the leather. Coarser grains accentuate this effect.
- The leather may experience a little softening due to some stretching or staking action.
- There will be substance reduction, compensated by a small degree of area gain.

- The leather may become heated causing some hardening of the fibre structure as well as surface discolouration.
- Grain swelling may occur after impregnation.

There are many variables both in buffing technique and outcome. Frequently buffing operations are carried out in one pass; hence the importance of precise machine parameter settings to achieve specific requirements. Factors and outcomes mainly related to machine functions include:

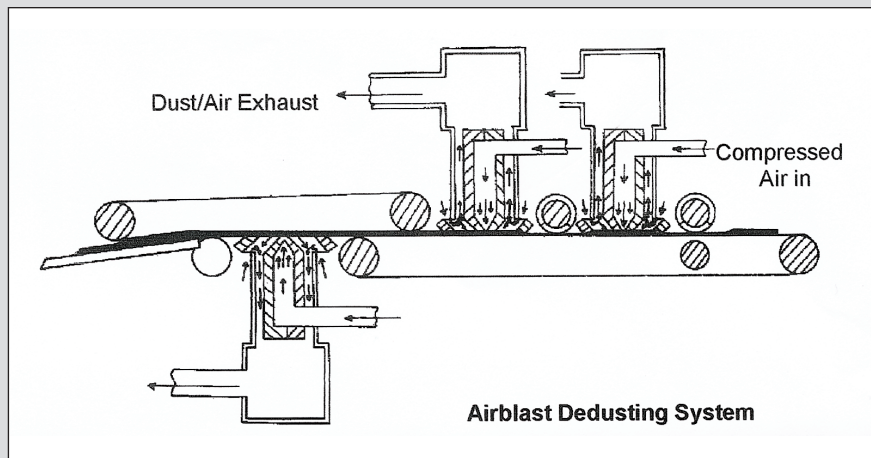
- Abrasive paper covered peripheral cylinder speeds range between 800 and 1000 m/min varying with make of machine. Often there is no facility to vary the speed of a given machine but sometimes variable speed in the
- range of 600m/min to 1200m/min is provided.
- Abrasive type belt machines use higher peripheral speeds of the order of 1200 to 1500 m/min.
- Classic deep throat buffers usually have fixed speed feed rollers producing feed speeds between 3.5m/min and 18m/min, depending on type of machine.
- Modern buffers have variable speed facilities producing up to 25m/min, 35m/min or 40m/min.
- Grain characteristics can be made to vary by varying cylinder speeds, feed speeds and/or altering feed roller pressure on the leather.
- Higher relative working speeds between leather and abrasive medium produce finer grain, lower speeds result in coarser grain.
- Modern machines automatically compensate for leather substance

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- variations occurring during the pass.
- The undesirable creation of line patterns is avoided by means of the axial oscillation facility of the work cylinder. Oscillation frequency is usually variable to suit the various grits of abrasive paper employed.
- Undesirable hardening of the leather surface can be controlled by means of water cooled work cylinders. (Modern machines may have this facility).

Abrasive papers

Guide to grit size designations:

- Coarse 60 grit
- Medium 80 to 150 grit
- Fine 320 to 600 grit
- Glue bonded paper, normally in a wide range of grit sizes, is generally used for upper leather buffing.
- Finishing of impregnated grain needs high grit numbers.
- Flesh side buffing normally uses medium to fine grit.
- Snuffing uses fine grit papers (400 to 500 grit).
- Corrected grain is produced initially with coarser grit and completed with medium grit (as a guide first buff usually 280 grit and final buff usually 320 grit).
- Resin bonded papers are tougher and last longer.
- Resin bonded papers are more suitable when working with higher humidity contents.

Outcomes on leather finish and properties

- Hard leathers leave short fibres and softer ones leave longer fibres on the surface of the grain.

- Short fibres tend to become tightly packed promoting fine and tight nap. The surface will be springy and rebounds from pressure. There will be no or little finger marking.
- Light grain buffing is used to produce nubuk.
- Buffing between base coating and finishing improves surface structure and consistency.
- Buffing of loose grain may cause it to swell. Impregnation followed by plating and fine buffing can again refine the grain.
- Re-tanning/fatliquoring practice can influence buffing properties.
- Loose leathers tend to retain poor break properties.
- Retannage shortens fibre structure but generally has no bearing upon tear resistance, firmness or softness.

SUEDING

“Two way” sueding produces long and soft fibres resulting in the velvet-like finish. Surface fibres are teased up by the grit and their length is uniform. The surface can be finger marked.

HEAVY GRAIN BUFFING OR REMOVAL OF GRAIN

Large follicle craters are levelled/flattened or become smaller. Buffing is only as deep as the craters. Deeper buffing exposes a coarse layer at the hair roots.

Corrected grain finish requires good buffing action.

The flesh side is buffed first to even out thickness. Subsequent grain side buffing reduces irregular fibre structure.

Removal of the grain layer which may exhibit coarse and/or stiff characteristics improves softness.

Hot plating before grain removal tends to produce a more uniform surface for corrected grain finish.

DUST REMOVAL

- Residual dust reduces adhesion of finish products.
- Sueded surface may tend to colour mark due to the presence of buffing dust.
- Horsing up may mark the surface due to the presence of dust.

Buffing machinery

There are three main types of buffing machines in general use.

- Firstly there is the return feed machine also known as the deep throat buffer where the buffed piece slides down into the “throat” between the machine and the work cylinder from where the operator retrieves it. The use of the deep throat machine is now mainly confined to the processing of smaller pieces.
- The second version is the throughfeed buffer where the buffed leather feeds out at the rear of the machine, generally dropping onto a conveyor which transfers it and feeds it into a de-dusting machine, either of the air blast or the brush type.
- Thirdly a throughfeed machine employing an abrasive belt in place of the abrasive paper covered cylinder is also sometimes in use.

In principle the working configuration all three types of buffer is similar. Broadly the arrangement puts the buffer into the open ended reciprocating multi-roller group of machines. The piece is fed manually from a horizontal opening and closing table (often via a grip roller) to the transport roller.

An adjustable guide blade holds the leather piece against the transport roller from where it moves to the abrasive paper lined cylinder or the abrasive belt. The guide blade is a key element of the system as it ensures that the leather piece is held uniformly during the buffing action. It prevents “grabbing” of the piece as well as holding it until all of it is buffed.

The operation is in-feed with the cylinder rotating at a much higher peripheral velocity than the feed rate. Pressure and substance setting devices are always provided. All modern buffer cylinders also oscillate axially to prevent buffing tracks appearing on the leather. Cooling of the cylinder by means of water circulation is often provided or may be an option. ☺