Splitting Machines

Splitting is the process of thinning or dividing hides of leather into two or more layers in order to get the leather into a workable thickness. Usually you can order your leather from the tannery in the thickness you desire, but in many cases a splitting machine will save you time and money.

For example, your project may require a more precise cut than the tannery can achieve. Maybe your job only needs a few square feet of a certain weight and buying a full hide would be impractical. A splitting machine would allow you to use the same hide throughout the project, creating a fully uniform piece with similar colors and textures.

Tannery Splitting Machines

Animal hides are not uniform in thickness. While the hide is in the limed or partially limed condition, the tannery will normally split the hide. Tannery splitting machines are very large and can handle hides from 5 to 10 feet wide. The machines use a band knife with rollers to feed the hide into the blade. Since the hides are wet while they are being pulled through the machine, they can stretch and deflect under pressure, so there will always be slight variations in the final cut. That is why leathers are usually sold with variable thickness (i.e. 9 – 10 oz.). Full hides can also be split after tanning.

Fixed Blade Splitting Machines

Pull-Through: The simplest splitter is the bench mounted, pull-through splitter. These machines are among the least expensive and many are available new. They are also limited to smaller widths due to the force it takes to pull the leather by hand. The operator would have to pull a piece through twice (once for each side) to get an even cut. Here are a few industry standards.

Common Fixed Blade
For lack of a better term, this type of splitter is the most common and widely used. The iron or steel frame houses a metal roller that moves against a fixed knife blade. The roll is held in place with a spring and depth is normally adjusted by a screw. The roll can be released to insert the leather to be split. The C.S. Osborne company made the basic No. 87 with a wood bottom, and the No. 86 in sizes 6, 7, 8, 10, 12 inches. Today they only manufacture the No. 86 with a 6 inch blade. The Joseph Dixon company of England makes a similar style in a 6 and 8 inch version. You can also find a simple version by Craftool and other inexpensive replicas made in the overseas. The trick to these machines is a uniformly sharp blade and an even pull. A dull blade or an uneven hand can cut a strap right in two!

“Chase” Splitting Machine
The “Chase” Pattern Splitters utilize a upper and lower roll that work against a flat bed and blade made in sizes 8, 10, and 12 inches. The gears on top adjust the split depth. The Chase was sold by Osborne as the No. 171 and later copied by the old Randall company. Although its no longer made, used machines are fairly common among traders.
“KREBS” SPLITTING MACHINE
The “Krebs” splitter, first patented in 1884, was manufactured by the old Randall company and also sold by C. S. Osborne as the No. 85. The “Krebs” used a spring loaded upper roller to prevent 10 inch blade from gouging and cutting through the leather. It also had the special feature of a cam and lever to adjust the thickness. The ratcheting dial made it easy for the operator to select the split depth or return to a previous thickness. By moving the cam lever as the stock was drawn through, the operator could also lap skive a strap. These machines occasionally can be found used, but most leather shops don’t like letting them go.

“Keystone” Splitter and Skiver
The “Keystone” splitter was manufactured by Randall and also by Osborne as the model No. 84. The early model can date back to the 1870’s or 1880’s and a similar version, “Spitler’s” No. 83, was sold with a squeeze handle instead of a twist handle. Today a U.S. made “Keystone” can be purchased through Campbell Bosworth or an Asian version can be purchased through Tandy Leather Factory. Collectors should keep in mind that the various versions are not all interchangeable.

The “Keystone” uses a movable twist handle to set the blade depth. A locking stop can also be set to return to the same setting. The worker inserts a strap, pushes the handle forward and twists it to lock in the position. When pulling the strap through, the operator can continue to advance the handle forward with the free hand to create a tapered skive. The round bar across the blade edge helps prevent cutting the strap in two and keeps the operator from nicking fingers against the blade edge.

POWERED FIXED BLADE SPLITTERS
These splitters feature a set of adjustable feed rolls to advance the leather into the blade. They can be powered manually with a hand crank, or equipped with a motor. Like their pull-through cousins, blade alignment and sharpness is critical to getting a good split, and the larger the blade, the more pressure it takes to pull the leather through the machine. A fixed blade machine will only work well with firm leathers, as softer leathers will fold under pressure. They also have a tendency of compressing the leather as it cuts.

The Landis Model 30 is probably the most popular machine in the hand-crank variety. These machines were originally designed for shoe shops, but are useful in any leather shop. The model 30 came in two varieties: one had a ratcheting handle on top to adjust the split depth, and the older model had a lever with markings that was set with a wing nut. The American brand splitter (patented 1929) used the same principle, but the machine was driven in the opposite direction with the blade in front, as did the Champion type (patented 1933).
Large fixed blade splitters were made by Randall, U.S.M., and other lesser known companies. These machines normally have a geared wheel to adjust the split thickness. Some that have survived today are the Randall 10 inch, the 12 inch Randall No. 1, the 18 inch Randall No. 2, and the Randall “Stanley” Splitter in sizes 16 and 20 inches. From the early 1900’s through 1950’s, the U.S.M. Company produced a series of “Summit” splitters that ranged in size from 8 to 20 inches or better. Most of these machines were discontinued in the 50’s and 60’s once band knife splitters took hold of the market. Although a fixed blade splitter is less expensive than a band knife splitter, the blades need to be kept sharp and the larger blades should be professionally sharpened to ensure consistent cutting. This inconvenience, along with the limited application to only heavy-weight or firm leathers, contributed to the retirement of these machines. The large fixed blade splitters are still being used in many small leather shops. Parts are virtually inexcessable, but blades can be found for some models.

**Band Knife Splitting Machines**

The modern band knife splitting machine has a flexible knife in the form of an endless band that travels at high speed over a pair of large pulleys. Rollers grip the leather and propel it forward into the knife, slicing the leather into two layers. By adjusting the level of the rollers, almost any thickness can be split.

One of the earliest patents for a modern-type band knife machine was by the USM company in 1921, although the technology wasn’t perfected until decades later. In 1950 the Randall company patented their RBK splitters, available in 20 and 30 inch sizes. They later developed a 60 inch machine that could hold the same precision as a smaller unit. In the early 1950’s and 1960’s, USM patented the USA Model A 12 inch splitting machine. Then in the late 1950’s and 60’s the Fortuna-Werke company of Germany patented their 12 inch model 620 splitter. During the 60’s and 70’s Italian companies began to enter the market and Fortuna established its dominance in the industry.

Today neither the USM or Randall band knife machines are manufactured, although stones and blades are still available. The remaining companies that still manufacture splitters are Atom (Italy), Camoga (Italy), Fortuna (Germany), Fratelli Alberti (Italy), and Sagitta (Italy). The Albeko company (Germany) discontinued manufacturing, and parts for these splitters are rare in the US. Both the Ellegi (Italy) and OMSA (Italy) lines merged with other companies and parts are still available for most models.
The basic band knife splitter consists of...
- Large driven pulleys to carry the band knife at high speed
- Feed roll group
- Blade sharpening group
- Vacuum group for grinding dust and splitting waste

When choosing a band knife machine, the first requirement is meet is the maximum splitting width needed for your shop. Most manufacturers supply machines in widths from 12 inches to 24 inches wide. The machines are made in three varieties: Mechanical (with electric drive), Electronic (added electronic display of thickness) and Automatic (fully programmable). Other features should be studied among each brand to find the best machine for your price range and application.

The price of a new band knife machine can vary between $17,000 to $200,000 depending on the make, size and features. Used machines usually can cost between $2000 and $12,000. When purchasing a used band knife splitter, it’s important to research the make and model to ensure easy access to parts and technical support. It’s also important to thoroughly inspect or have a guarantee of the machine’s condition, since it’s easy to spend thousands on parts and repairs for a worn out machine.

**Variable Features**
- Fixed foot for precise splitting of thinner leathers or upper roller for thick applications
- Feed rolls can be supplied in a variety of knurled steel or rubber, depending on the application
- Digital display of thickness settings
- Variable speed control feed system
- Long-life ABN Borazon blade grinding wheels (diamond chip)
- Automatic blade advance to compensate for the wear of the blade or the blade driving system
- Safety sensors to disable the machine if covers are removed during operations or if a malfunction is detected
- Machines normally use 220 volt 3-phase power, but single phase 220 volt can also be used.

**Advanced Features**
- New generation “Automatic” machines can accept programmable parameters. Once the parameters of a job are set, the operator can later select those settings to run the same exact job. The machines also inform the operator of potential problems, malfunctions, maintenance schedules, etc.
- *Electronic thickness detector* digitally measures the thickness of any part split and informs the machine about the actual value. The machine can then adjust its settings automatically to match actual thickness with the requested one.
- Some machines are equipped with a *Tab Split* setting to split belt ends. The strap enters the machine for a set time and then is automatically reversed for a partial split.
- *Pattern Skiving* attachments are designed for skiving strips of leather

**More Applications:**
Besides leather, band knife splitters have been used to process cork, foam, felt, carpet, plastics, rubber, and medical tissues. Splitting machines are used in laboratories for cutting test samples and custom engineered machines are used in medical applications for splitting tissues. For processing plastics and rubbers, lubrication devices are installed to prevent the materials from sticking. It’s amazing how a simple technology designed for the leather industry has expanded to be used in cutting edge applications.