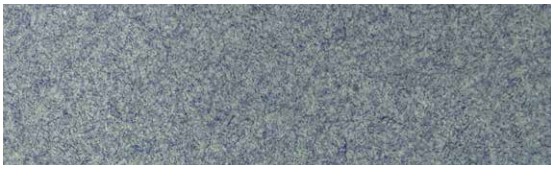
A Glossary of Flaws and Features Found in Handmade Paper

Arranged by the Materials, Tools, and Operations of Traditional Hand Papermaking

I. Rag Preparation & Beating

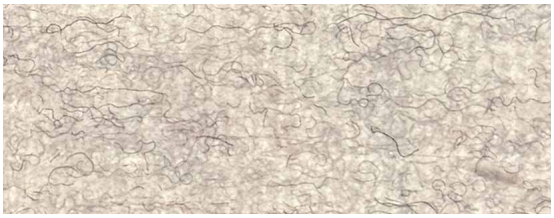
Brown or gray paper (papier gris)
Paper made from darker, lower-grade, or poorly processed rags, often coarser and containing knots or other inclusions. Dark coloration could also result when damp rags were fermented [retted] too long, developing black mold that could darken the finished paper and weaken the fibers.

Colored paper: dyed-rag furnish
Fibers retain their individual colors after beating, producing a mottled or filamentary appearance rather than completely uniform color.

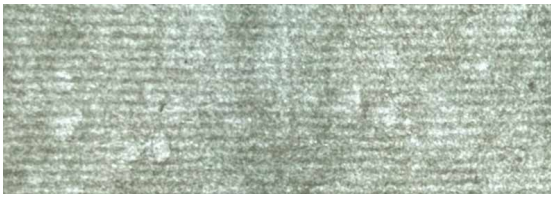


Colored paper: pigment in the beater
Finely ground pigment disperses throughout the stuff, generally producing a flat, relatively uniform color.

Fiberous non-cellulose inclusions
Wool, silk, nylon, or other non-cellulose fibers appear as visible strands. They may be accidental contaminants, decorative additions, security features, or functional ingredients.



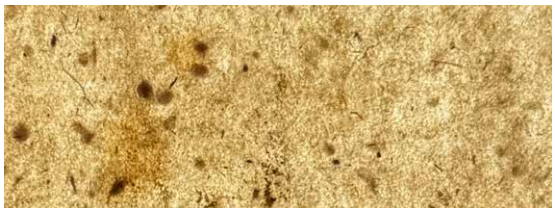
Froth or foam spot, bell, bubble mark
(aka bubble rings) Protein, gelatin, or other contaminants stabilize foam in the vat. Surviving bubbles displace fibers and leave circular, ringed, or crater-like marks.



Inclusions from incompletely dispersed recycled paper : Dense fragments or nodules formed when recycled sheets, scraps, or sized "hard broke" are not completely softened and dispersed.

Reading note. The boundary between a flaw and a feature depends on context. Qualities once rejected as manufacturing defects may now be valued as evidence of materials, tools, technique, and historical use.

Knots (fiber bundles)
Tangled clumps of insufficiently broken down and dispersed rag fibers. They indicate poor sorting, uneven retting, inadequate beating, or incomplete clearing in the Hollander beater.



Optical brighteners
Modern fluorescent additives in rags or paper that create an unnaturally bright blue-white appearance under ultraviolet light. Their presence can reveal modern fiber contamination.

Specks
Small visible foreign particles identified according to the material from which they originated. (bronze, button, carbon or cinder, iron, rosin, rubber, size, wood, etc.)

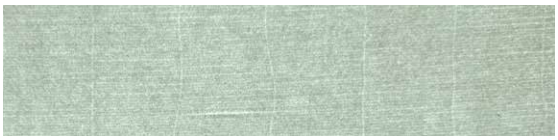
Shives
Small, dark, splinter-like pieces of woody plant core left by incomplete retting, cooking, scutching, or beating of flax and hemp. Can also be introduced from splintering stamper hammers, or rotting wood between a beater's fly-bars.

Waterleaf paper
Paper that has been formed, pressed, and dried but not sized. Because it is highly absorbent, water-based ink can spread or bleed when applied to its surface.

II. Mould & Deckle Features

Antique laid paper
Paper formed on a mould whose laid covering consists of closely spaced laid wires held together by more widely spaced chain wires. The covering is sewn directly onto the ribs of the mould, producing shadows on either side of the chain lines in the finished sheet.

Broken or wavy chain and laid lines
Kinks, gaps, or displaced lines record physical damage to the mould's wire covering.



Deckle edge
The naturally feathered perimeter formed where pulp meets the removable deckle. Historically trimmed, it is now often prized as a feature.

Laid paper from a worn or damaged mould

Loose, bent, broken, or repaired wires produce distorted, interrupted, missing and unusually irregular laid and chain lines.

Light-and-shade watermark

An embossed wove screen produces graduated paper thickness, allowing tonal, three-dimensional images rather than simple line designs.

Modern laid paper

Made with a two-layer mould covering that separates the laid surface from the wooden ribs. Its pattern is more regular and shows no rib shadowing unlike antique laid paper.

Visible chain-line tie-downs

Small interruptions or nodes where the wire surface was fastened to the ribs of the mould. These appear as repeated details along chain lines.

Wild deckle, feathered, rebordée, or dentelée

An unusually irregular edge caused by poor mould/deckle fit, uneven drainage, or lifting the deckle before the sheet has stabilized.

Wire gauge and spacing

The thickness and interval of laid wires determine to some extent the scale and strength of the visible pattern and can help characterize a mould or period.

Wire watermark

A raised wire design attached to the mould displaces pulp, creating a thinner, lighter image visible in transmitted light.

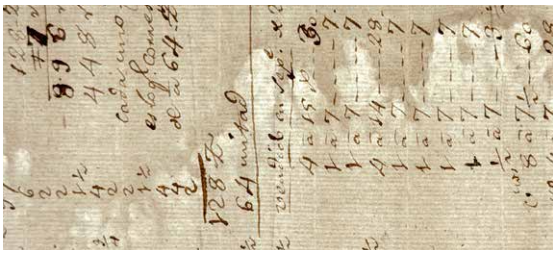
Wove paper

Paper formed on a mould with a fine woven-mesh covering separated from the ribs by a coarser secondary mesh, which prevents rib shadows. The finished sheet has a comparatively uniform look-through, without a pronounced laid-and-chain-line pattern.

III. Sheet Formation

Cloudy sheet
Uneven light-and-dark formation caused by an imperfect dip, poorly timed or insufficient shaking, premature drainage, or inadequately prepared pulp.

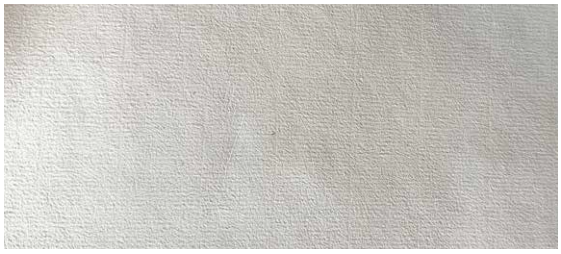
Cumuli-pattern felt-side tidal disruptions
A flowing pattern of felt-side disruption caused by a depression in the post, such as one resulting from misaligned felts, combined with a wet stuff and excessive couching pressure. It creates irregular, tide-like boundaries, with displaced fiber accumulating along one side.



Holes made and filled by the vatman
When a knot, shive, or other inclusion is picked out from the wet sheet, it may leave a hole in the fiber mat. The vatman may scoop a small amount of stuff from the vat and drip it into the void to fill the opening, leaving a visible patch of different thickness, texture, or fiber distribution.

Sloughed sheet during draining
A still-fluid fiber mat slides, wrinkles, or breaks apart when an insufficiently drained sheet on mould is tilted too steeply or handled too soon.

Strong surface laid pattern
A pronounced wire texture produced by the structure of the mould covering, a free stuff with fibers of moderate but not excessive length, a two-sided felt with a short nap on one side and a long nap on the other, and spur or unconstrained drying.



Thin edge from a clogged screen
Fibers lodged in the leading portion of the mould impede drainage, leaving a lighter, thinner band on the sheet's "bad side."

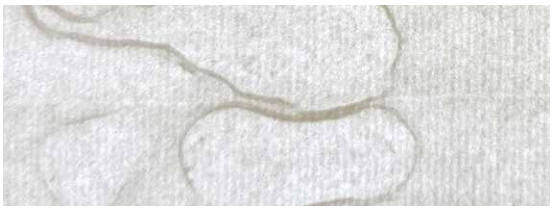
Thin perimeter from premature deckle removal
Wet stuff escapes beneath or beyond the deckle as it is lifted, producing a thin border and frequently a wild deckle.

Vatman's drip marks (aka tear or gouttes d'eau)
Crater-like marks made when drops fall from the vatman or deckle onto the felt side of a newly formed sheet. The laid pattern remains visible inside the disturbance. *See also Coucher's drip*

Wild formation
Severe mottling, crazing, fiber upheaval, or uneven distribution caused by erratic dipping, forceful shaking, under-processed rags or long fibers in the stuff, splashing, or other major disturbances during sheet formation.

IV. Couching Flaws & Felt Impressions

Air bubbles, blisters (musettes)
Air trapped between a felt of a newly couched sheet can create raised bubbles in the sheet. When pressed, the bubbles leave circular thin areas with thickened margins. Puncturing them may leave light-and-shade fingerprints.



Coucher's drip marks (aka tear or drop)
Water drops falling after couching strike the exposed wire side of the sheet, creating craters in which the laid pattern is disrupted or absent.

Crush marks (écrasé)
Excessive couching pressure on a very wet, heavy, or slow-draining sheet forces water laterally through the fiber mat, producing long, mottled, stretch-mark-like scars. Often found on the "bad side" of the sheet.

Deckle remnants
Dried fiber fragments from an earlier sheet transfer from a dirty felt, or wet pulp hidden beneath a poorly fitted deckle falls onto the next sheet.

Dragged felt
Dragging or repositioning a felt across a newly couched sheet shears the wet fiber mat, often rolling its far edge into an arcing ridge.

Far edge folded back during couching

Uneven pressure allows part of the sheet to cling momentarily to the mould and then fold over itself, producing a doubled edge.

Felt hair marks and embedded hairs

Guard hairs in mixed hair-and-wool felts, made from the fleece of hair sheep, may leave grooves or impressions in the paper's surface or become embedded in it.

Lost corner

An over-drained sheet or insufficient couching pressure prevents a corner or edge from transferring from mould to felt; it may tear away or be awkwardly reattached.

Sewn or mended felt marks

Heavy stitches and patched areas in repaired felts emboss diagonal ridges or other localized patterns into the paper.

Slurred chain lines

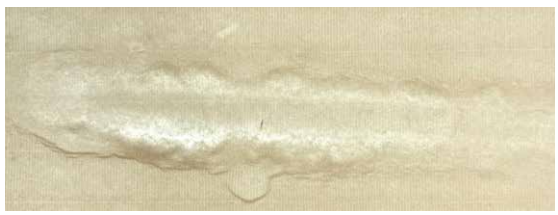
Sliding or twisting the mould during couching drags the wet fiber network and smears the chain-line pattern.

Stitch watermark or machine-seam mark

A band of stitch impressions formed at the joined ends of an endless forming wire or a mend on a wove mould

Top-sheet impact disruption

The edge of a mould striking or resting on the post disturbs the sheet beneath the upper felt, leaving a light-and-dark light and shad stripe.



Worn-felt weave marks

As the felt's nap wears away, its woven foundation presses a textile-like grid or "shagreen" texture into the damp sheet.

V. Pressing, Parting & Drying

Back mark
Parallel ridges form when a small group of sheets, known as a "spur," is draped over a rope or pole to dry. The ridges usually run parallel to the chain lines and through the center of the sheet.

Cockling
Irregular waves, puckers, and undulations caused by uneven shrinkage as a sheet dries without sufficient restraint. Differences in fiber distribution, moisture, sizing, or drying rate can make some areas contract more than others.

Diamond-shaped cockling
A large, diamond-shaped pattern of raised and depressed areas created by directional fiber shrinkage and uneven restraint during drying. The pattern may result from the sheet's edges drying faster than its center and can be influenced by humidity, air movement, support, and the sheet's orientation or arrangement during drying.

Lost or damaged corner
A sheet damaged during couching, parting, or sizing, in which a corner was torn away and, in some cases, subsequently reattached.

Secondary back mark
Additional ridges created when a drying spur is bumped, folded, or displaced from its normal position on the rope.

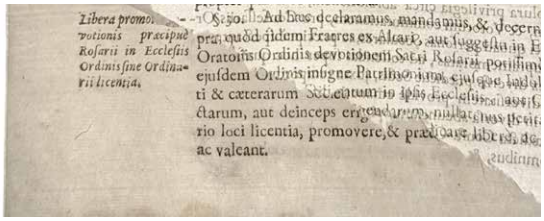
VI. Sizing Flaws & Features

Animal-gelatin sized paper
Sheets that have been immersed in warm animal-skin size. The gelatin strengthens waterleaf paper, reduces absorbency, and helps prevent ink from feathering.

Crumpling or crimping while wet with size
Mechanical damage breaks or compresses fibers while the sheet is gelatin-wet. The disrupted lines absorb more size and dry as translucent creases.

Crystals or shiny size spots ("sugaring")
Gelatin or associated materials crystallize or concentrate on the surface, leaving sparkling, glossy, or translucent spots.

Glued corner
A sized sheet folds or touches itself while wet with size; the gelatin bonds the contacting surfaces, leaving a permanently doubled and adhered corner or edge.



Internal or engine sizing
Size is added directly to the stuff rather than applied by dipping the finished waterleaf sheet. Modern examples include starch and alkali-compatible synthetic sizes.

Over- or under-sizing
Excess gelatin size can make paper stiff, glossy, uneven, or stuck together; insufficient size leaves it weak, absorbent, and prone to ink bleeding.

Size concentrated at the edge
Size may migrates toward a drying perimeter and accumulates there, creating a darker, harder, glossier, or more translucent border.

VII. Glazing, Burnishing

Burnished ruling ridge
A cord or wire placed beneath a sheet during burnishing creates a shallow raised line that can serve as a writing-margin guide.

Burnishing or glazing marks
Polished stone, wood, trip hammers, or glazing rolls compress the surface and can create glossy marks, or directional streaks, and variations in raking light.

Glazing-roll finish
Wooden and metal rollers mechanically consolidate and smooth paper, creating a more uniform, closed surface than hand burnishing.

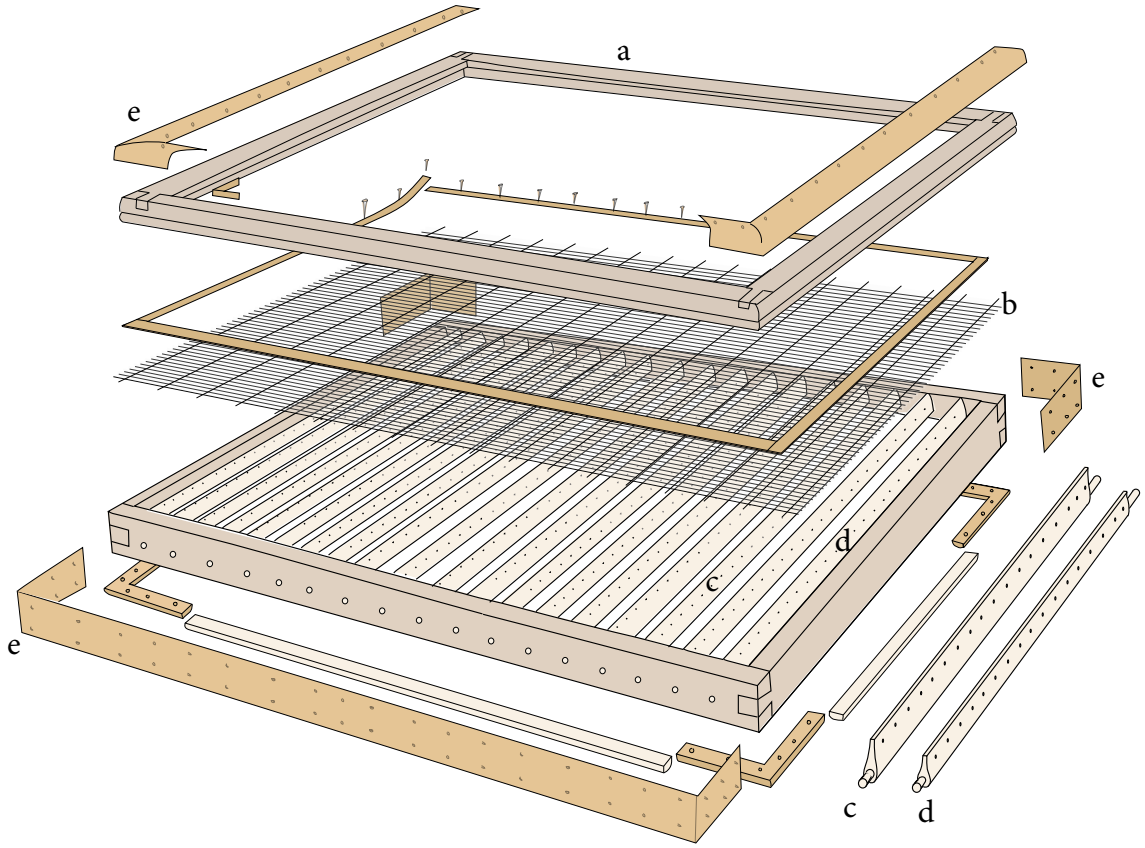
Appendix A
Glossary of Papermaking Terms

Air-dried: Paper dried by exposure to air rather than by direct contact with heated cylinders. The air may be still or circulated naturally or mechanically and may be heated. Individual sheets generally dry unconstrained, while sheets dried together in spurs constrain one another.
Asp, Ass, or Horn: A curved wooden support at the corner of the vat where the coucher rests the mould while it drains.
Bad side: The lower half of a traditional hand mould or sheet, often thinner because this area of the mould covering clogs more readily.
Bon Carron: A French papermaking technique in which the mould is tipped toward one corner after sheet formation, causing additional fiber to collect there and strengthen the corner for handling by the parter or layer.
Bridge: A platform across the vat along which the coucher returns the empty mould to the vatman.
Burnishing: Smoothing and polishing the surface of paper by rubbing it with a hard, smooth tool, such as a stone, glass, or metal burnisher.
Cassie: The often-damaged outside quires of a ream of good handmade paper.
Constrained-dried: Paper dried while shrinkage and movement are restricted. Examples include handmade sheets dried together in spurs and machine-made paper dried on heated cylinders or dried flat under pressure in a stack dryer or dried adhered to wood or glass.
Coucher: The worker who transfers each newly formed sheet from the mould onto a felt.
Couching: Transferring a newly formed wet sheet from the papermaking mould onto a felt.
Countermark: A smaller or subsidiary watermark accompanying the principal watermark in a sheet of handmade paper. It commonly identifies the papermaker by name or initials and may also indicate the mill, place, or date of manufacture. The countermark is usually placed in the opposite half of the sheet from the main watermark, although corner and edge positions also occur. Countermarks became increasingly common in European papers from the sixteenth century onward.
Crosses: / B, B XX, or XXX — Marks placed on wrappers or ream edges to identify defective or lower-grade paper.
Deckle: The removable frame fitted around a mould to contain the pulp and determine the sheet's size and edges.
Dewatering: Removing water from pulp or a wet sheet through drainage, suction, pressing, and drying.
Felt side: The side of a sheet that contacts the felt during couching, opposite the wire side.
Furnish: The fibers and other materials, in specified proportions, from which a particular paper is made—effectively, its recipe. In modern machine papermaking, furnish may also refer to the prepared stock supplied to a paper machine's headbox.
Glazing: A finishing process that smooths and compacts the surface of paper by pressure or friction, often after sizing, producing a smoother and sometimes more lustrous surface.
Hair lacings or stitches: In early times the chain wires in moulds were frequently fastened with hair, so that the chain lines were not visible.
Horse- or cow-hair rope: A drying rope, over which handmade paper is hung in the drying loft.
Laid: Paper showing parallel laid lines and wider-spaced chain lines created by a laid-wire mould.
Layer: The worker who separates pressed handmade sheets from the felts.
Mould covering: The laid or wove wire screen through which water drains while the paper sheet forms.
Parter: A worker who separates pressed or sized sheets from a wad before they are hung to dry.

Post: A stack of freshly couched handmade paper built up at the vat, consisting of wet sheets alternated with felts and assembled to a quantity convenient for pressing. The number of sheets in a post varied according to place, period, and sheet size: historically it was often about 144 sheets, or six quires, although sources record approximately 110 sheets in France, 160 in Holland, and as many as 200 sheets in later hand papermaking. After pressing, the felts are removed and the wet sheets may be restacked and pressed again as a white post, also called a pack.**Ribs:** Thin wooden bars that support the wire covering of a papermaking mould; under the chain lines on laid mould.
Seconds: Sheets classified below first quality because of imperfections.
Sidedness: The difference in texture, appearance, or composition between the two sides of a sheet.
Sizing: Treating paper, traditionally with gelatin or animal glue, to reduce absorbency, strengthen the sheet and its surface, and improve its performance for writing, drawing, or printing.
Spur: A group of several sheets dried together as a single wad in a drying loft.
Stay: The platform beside the vat along which the vatman passes the newly formed sheet and mould to the coucher.
Stuff: The traditional hand-papermaking term for prepared pulp or fiber suspension ready for sheet formation, including the material held in the vat.
Stuff chest: A container in which prepared stuff is stored and kept uniformly suspended before being delivered to the vat or papermaking machine.
T: A *T-shaped* wooden tool used to carry, hang, or remove sheets and spurs from drying ropes.
Twin moulds: A matched pair of papermaking moulds used alternately with a single deckle during the building of a post. Each normally bears a closely related twin watermark; where countermarks are used, each mould generally carries its own corresponding countermark.
Unconstrained-dried: Paper dried as individual sheets without pressure, adhesion, or tension restricting their movement, allowing the sheets to shrink, curl, or cockle freely.
Vat: The tank containing the water-and-fiber stuff used to form handmade paper.
Vatman: The worker who dips and shakes the mould in the vat to form each sheet.
Watermark: A deliberate design, symbol, name, or device formed in handmade paper by shaped wire attached to the surface of the papermaking mould. The raised wire displaces fibers as the sheet is formed, creating a thinner area that appears lighter when viewed by transmitted light. Watermarks may identify a papermaker, mill, place of manufacture, paper size or grade, or serve as a trade or identifying mark. Where a countermark is present, the principal watermark is generally positioned in one half of the sheet and the countermark in the other.
Wire side: The side formed against the mould or machine wire, often showing wire or laid impressions.
Wove: Paper made on a finely woven wire covering, producing an even surface without laid lines.

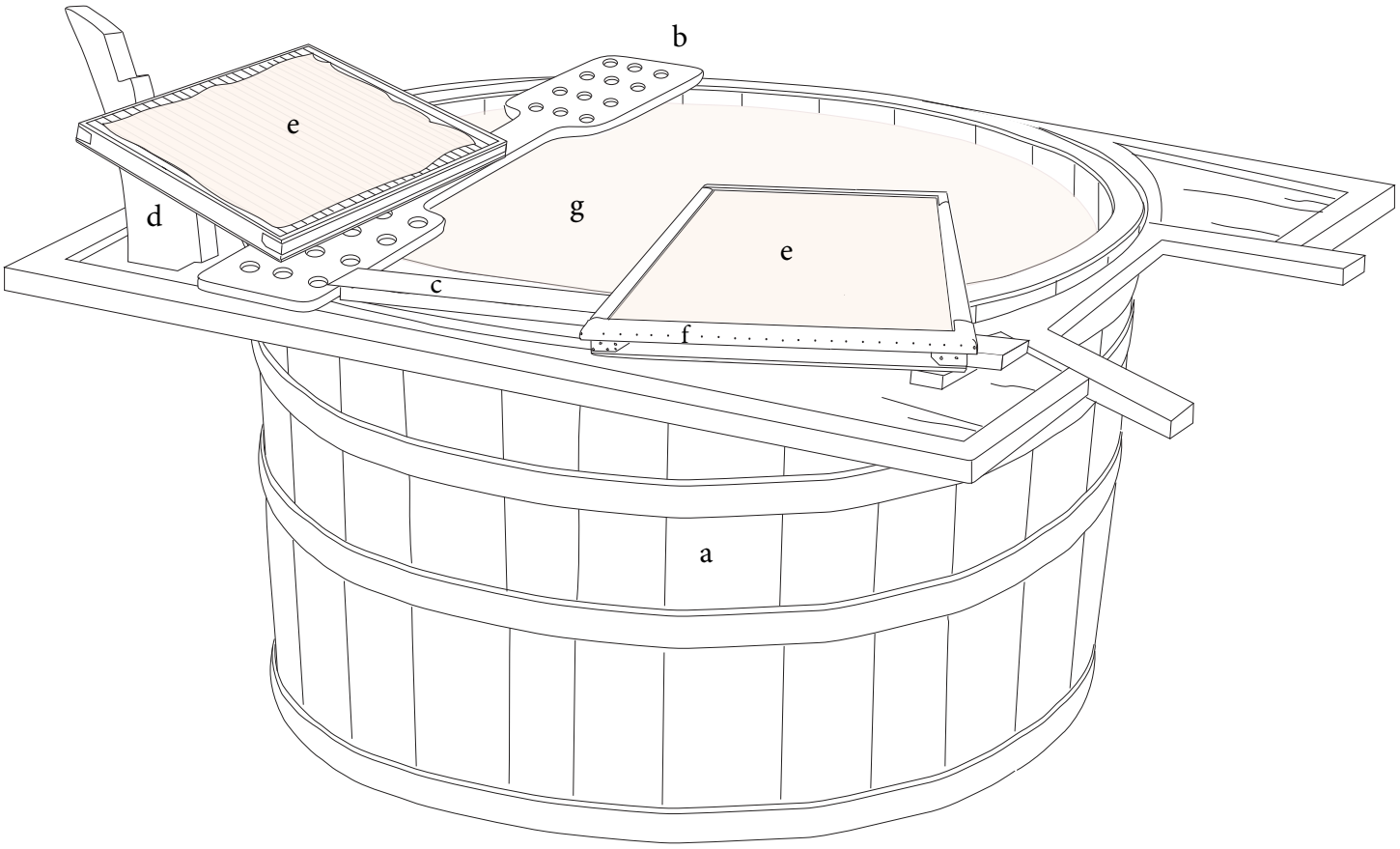
Source: *Flaws & Features in Handmade Paper,* version 22,
By Aldo Farnsworth and Max Thill, Magnolia Editions.
Illustrations by Aldo Farnsworth

Appendix B
Antique Laid Paper Mould



a: **Deckle** b: **Laid screen** mould covering c: **Ribs** d: **Drip line or drip ribs** (outer most and smaller than central ribs) e: **Brass reinforcement** elements

Appendix C
Vat, Bridge, Stay, Ass and Mould Set



a: **Vat** b: **Bridge** c: **Stay** d: **Ass, Asp, or Horn** e: **Mould,** f: **Deckle,** g: **Stuff**

Acknowledgments

In this second—or perhaps third—revival of hand papermaking, we are fortunate to have a community of artists and craftspeople, paper conservators, bookbinders, letterpress printers, and others who are generous with their knowledge and committed to keeping the practice of hand papermaking alive.

Their thinking, mould making, equipment design and fabrication, historical research, and help in locating antique papers with revealing flaws and features have contributed greatly to this endeavor: to make a simple, accurate, and visual glossary of the flaws and features found in handmade paper.

Max and I are deeply indebted to:

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