Using Fines to Determine Wire Side vs Felt Side

Fines: finely divided matter found in the white water: cellulose, hemicellulose and additives (i.e., $MgCO_3$, fillers, pigment).

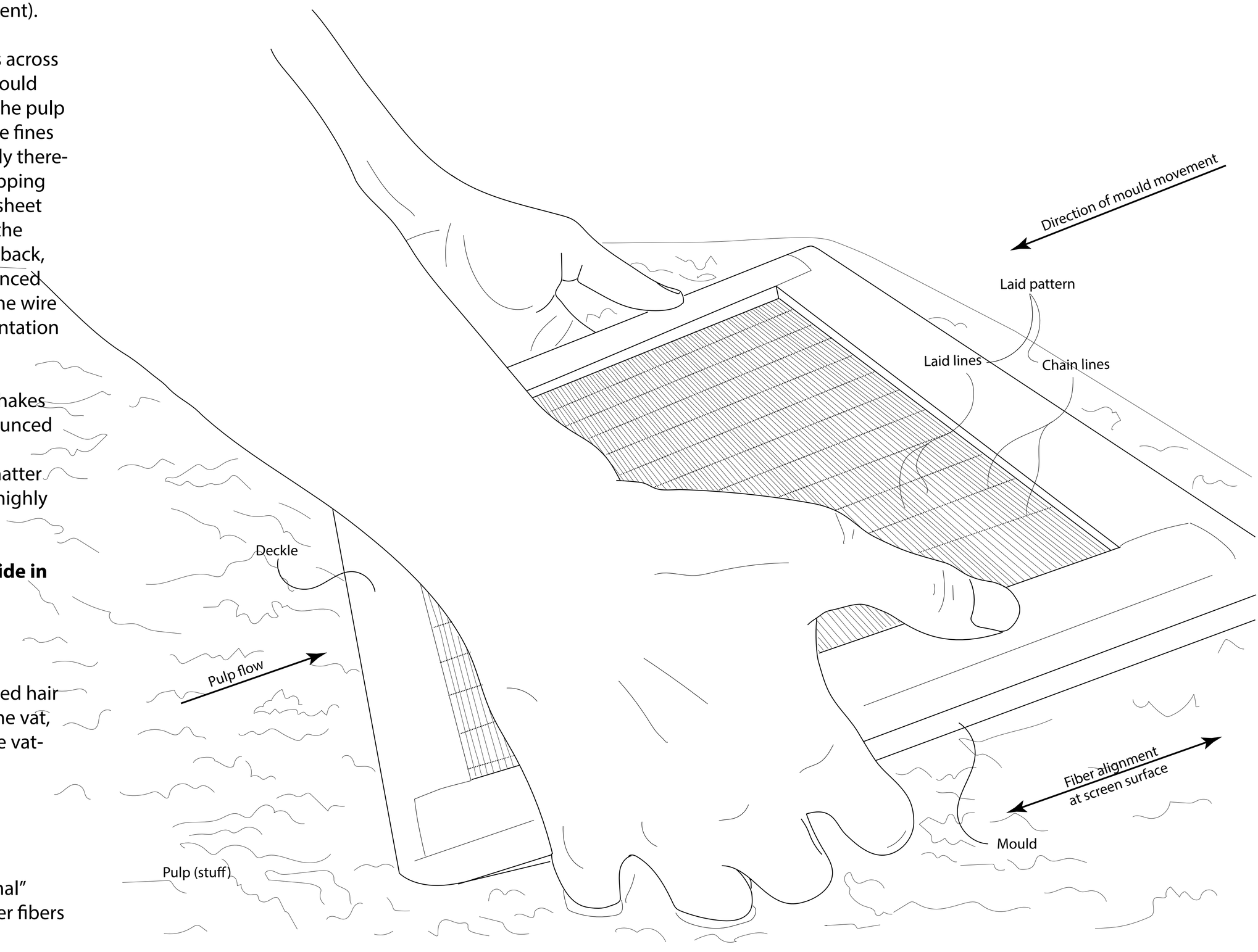
During sheet formation pulp flows across the mould perpendicular to the mould covering laid lines. Initially, when the pulp first impacts the mould surface, the fines fall through the screen; very quickly thereafter a fiber mat starts to form, trapping the fines on the upper side of the sheet (the felt side). The vatman shakes the screen side to side and forward to back, crossing the grain. A more pronounced grain direction may be found on the wire side and a more random fiber orientation is found on the upper, felt side.

Note: Machine-made paper only shakes side to side creating a more pronounced grain directionality.
Note: Freer pulp retains less fine matter (cellulose and mineral fines) than highly processed pulp.

Characteristics of wire and felt side in a finished sheet of paper:

Wire side:
Chain lines indented (if visible)
Fibers are more aligned, like combed hair (in parallel to the swirl of pulp in the vat, combined with the direction of the vat-man's dip).
Fewer fines - more fibrous

Felt side:
Fibers more random
More fines - areas where the "normal" fibers are hidden by smaller, shorter fibers



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