



Camera-assisted, real-time marker matching. Adjustments made in accordance to the pattern of the currently spread fabric.

Target industry:

Manufacturers of high quality clothing made from patterned, woven or printed fabrics.

Characteristics:

- Semi-automatic pattern matching with millimetre accuracy in a pre-determined hierarchical sequence.
- X/Y piece realignment in accordance with the pattern, within the blocking tolerance while retaining the exact piece dimensions (no bow & skew).
- A camera bridge with its own matching window (1st table segment) makes it possible to work with a time overlap without reducing the cutter capacity (2nd table segment).
- No specialist matching or cutting knowledge is required for this application.
- Easy to learn and productive after only a few hours of introductory training.

match-it

Procedural Description

Application data:

A normal, optimised single marker (from lay.assyst, for example) is the prerequisite for the matching process. A sufficiently large blocking tolerance (movement allowance) is then added around the pieces so that they can be shifted in the X or Y direction to correspond to the repeat pattern. A marker prepared in this way may even be used for different repeat sizes. In the interests of fabric economy, it is therefore prudent to lay markers containing blocking tolerances of varying sizes in order to achieve optimal matching when several repeat sizes and types are invoked.

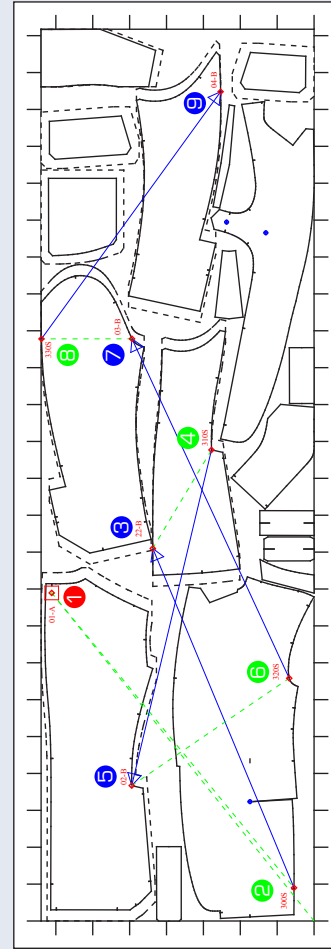
Work area:

match-it is integrated into a cutting line that may consist of up to four, usually equally long table segments loaded via a continuous conveyor belt, and comprised of:

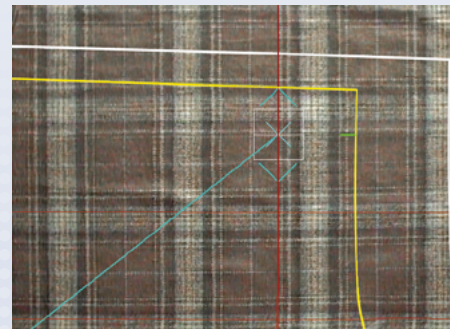
- the matching segment with a camera bridge and terminal (workstation);
- the cutting segment, containing a single, medium or high ply cutter; and
- the clearing segment for removing the cutout pieces.
- Additionally, in order to support smaller configurations, for example, markers consisting of only two segments, can the components be installed on an existing spreading table at the material intake (front-end) and the matching camera mounted onto the cutter bridge.

Process sequence:

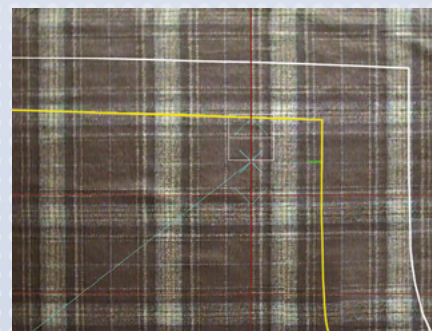
1. The pattern positioning correction process (matching) as described here transpires exclusively on a PC workstation, preferably located near the cutting table where the matching is to take place.
2. The spread fabric ply is referenced at two points by means of the camera image at the workstation and in this manner aligned paraxial to the marker. Thereafter the corresponding marker is then superimposed onto the camera's live image. The camera captures a section measuring approximately 16 x 12 cm.
3. Before the camera moves to the first matching point, the user defines the actual repeat size by drawing a box over a repeat with two mouse clicks.



Hierarchical dependency of the matchpoints in the marker



Piece position (yellow) prior to correction

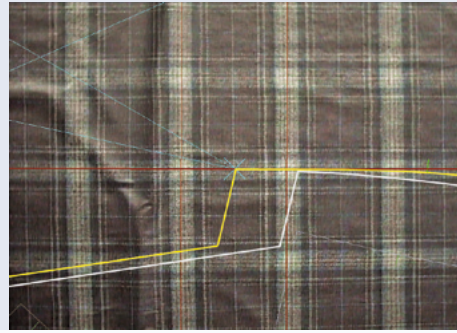


Piece position (yellow) after correction

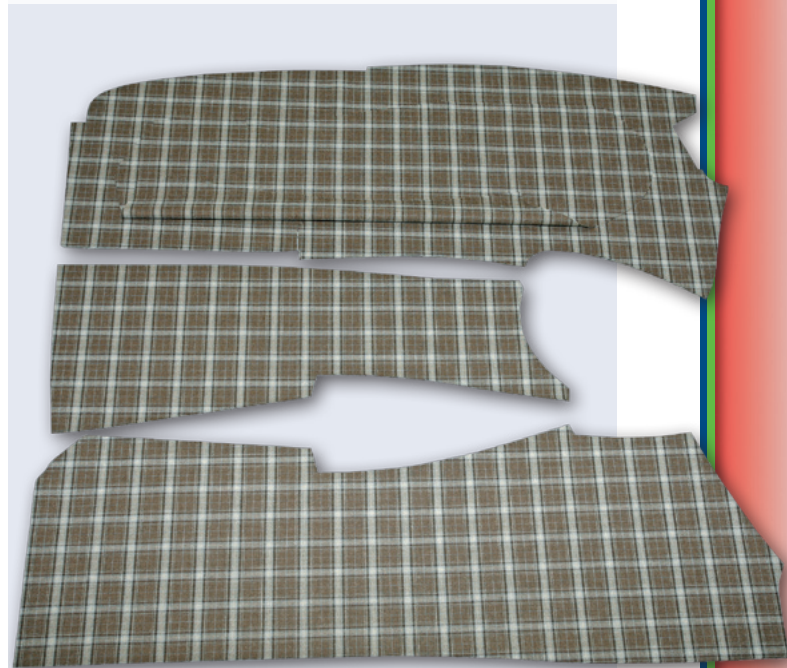
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Procedural Description

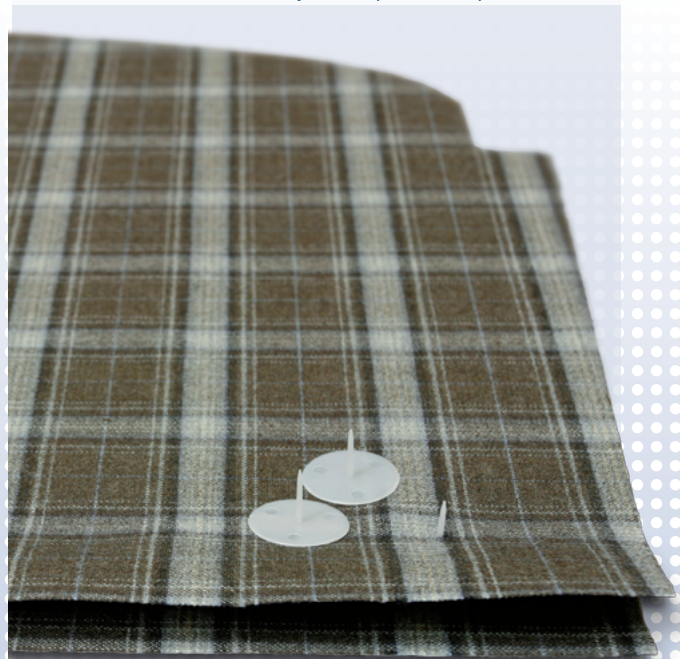
- Once the repeat size has been defined the camera automatically traverses to the first matchpoint. The marker contains information about which match point has which function. This is a hierarchically structured system on two levels. Within it there are absolute points, for example, those that must be positioned precisely between two stripes in order to generate a specific pattern on the finished product. The secondary level contains points whose position in the pattern repeat must be established so that it can be transferred in order to transfer it and apply it to other points that are dependent thereon. This information is not relevant for the application as such because the software automatically processes the match points (in the background) in accordance with their function. The user only has to click on a repeat stripe at each position approached by the camera. Depending on whether the respective matchpoint is to be adjusted in an X or Y direction, the cursor changes shape, enabling the user to always recognize if the point is to be shifted in a vertical or horizontal direction.
- The user is warned if a correction happens to cause a partial overlap, for example if an attempt is made to position the piece outside of the blocking tolerance. A deeper understanding of the system is not required! Hence, semi-skilled personnel can soon master this workstation.
- If all of the match points within one cutting window were corrected during the automatic sequencing, the marker segment then traverses into the cutting window via the conveyor belt, with the advantage that the spiked and matched bundle can no longer be shifted during conveyance, as there exists no transfer station at this point. As a result, the material is cut with millimetre precision and in accordance with the pattern repeat. During the cutting process the next matching procedure takes place in the subsequent marker segment. This means that the cutter can work and be loaded without interruption.
- In view of the fact that alignment and correction of the matchpoints conform to the pattern of the top ply, the individual material plies must be spiked on the top, in the case of lay piles the individual material plies must be needled so that the pattern positioning remains congruent to the top ply. A good result can be feasible, for example, when using small, plastic needles that can be cut through. In this way, then, it is possible to multiply the cutter capacity by comparison with single a ply. If doubled plies are used, depending on the working width of the table, it is possible to adjust and cut two plies parallel to each other.



Jump to side piece and correction (yellow)



Sections cut exactly to the pattern repeat

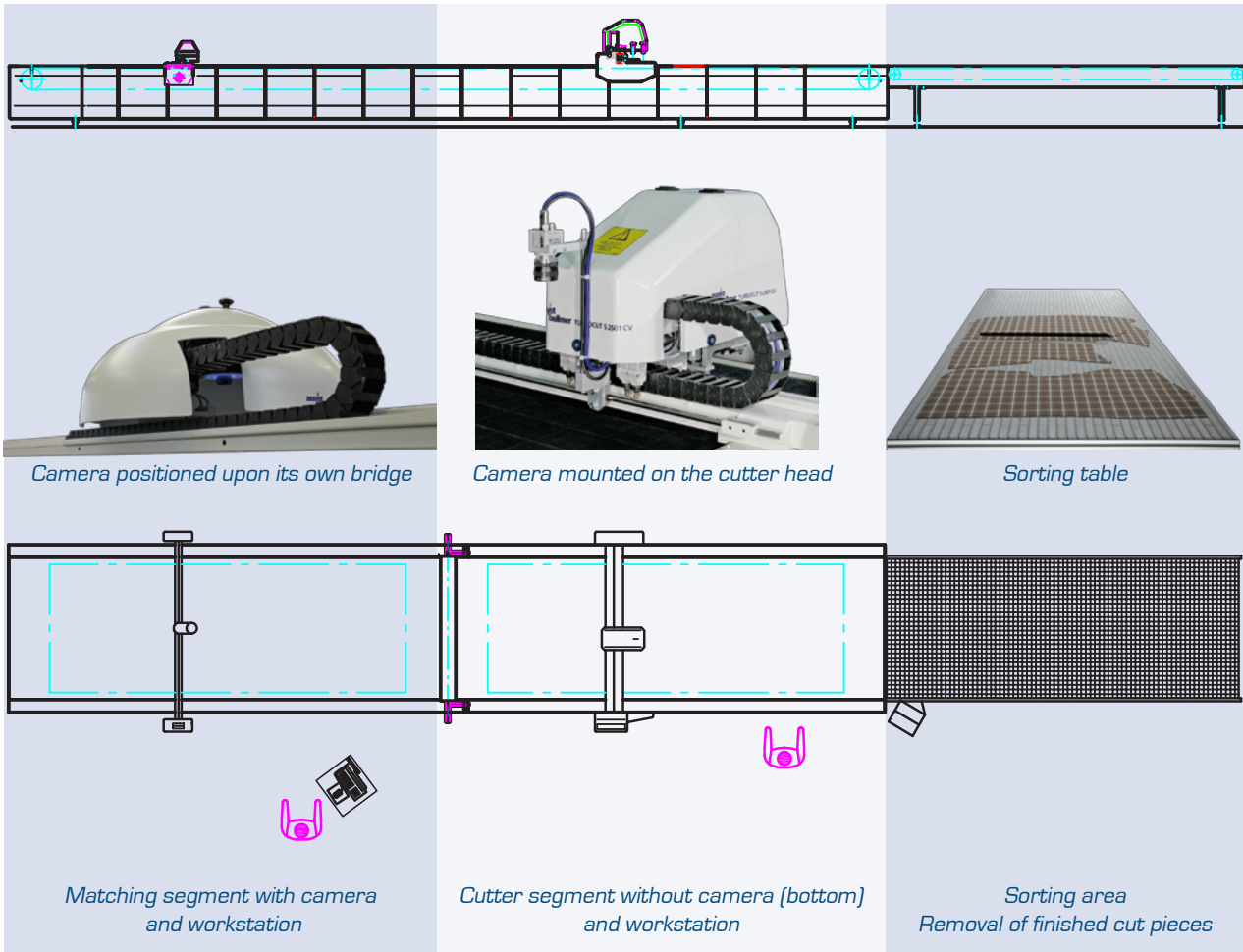


Plastic needles for spiking the laid material stack



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Example configuration



Technical data:

Working widths:	1600/1800/2000 mm (more widths upon request)
Camera technology:	CCD DSP colour camera 1.5 lux photosensitivity Backlight compensation
Connected camera bridge loads	230/400 Volt, 50/60 Hz
Power consumption	incl. vacuum system approx. 25 kW
Cutter data:	please request specifically for each type