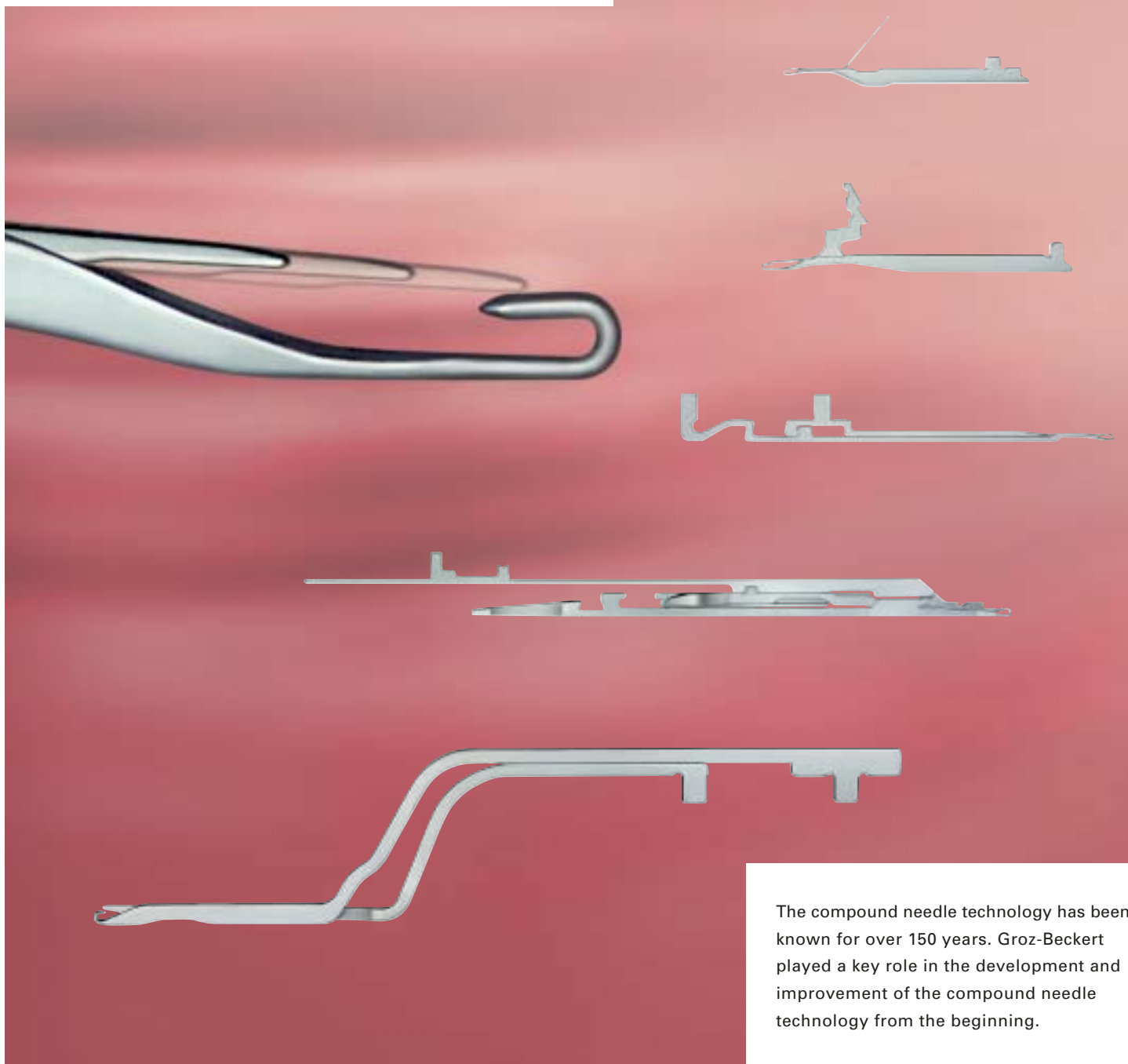


**COMPOUND NEEDLE**  
INNOVATION IN THE LOOP  
FORMING TECHNOLOGY



The compound needle technology has been known for over 150 years. Groz-Beckert played a key role in the development and improvement of the compound needle technology from the beginning.

Compound needles have been used in many areas of the loop forming technology. Today they can be found mainly in, warp knitting machines, flat bed knitting machines and narrow fabric warp knitting machines.

## LOOP FORMING PROCESS

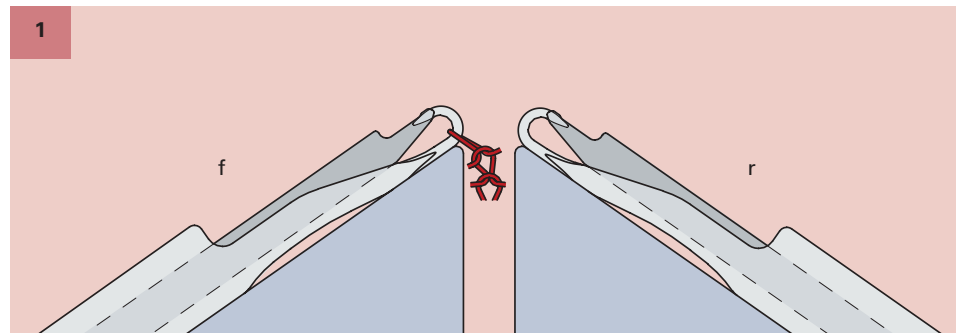
### COMPOUND NEEDLE FOR FLAT BED KNITTING MACHINES

#### Definition:

The compound needle consists of two parts, needle body and slider. These two parts are moved independently.

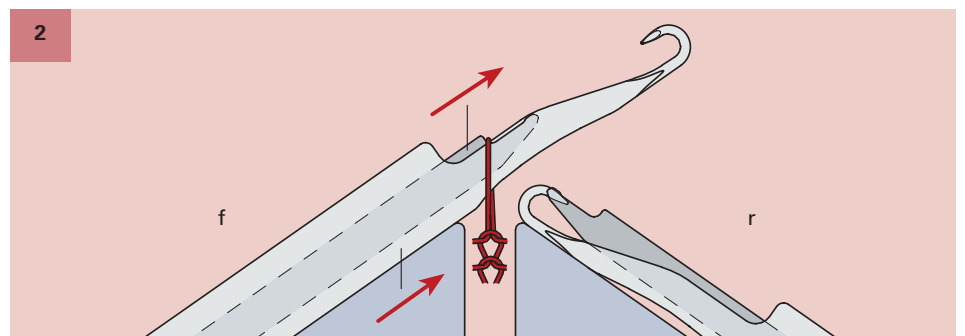
#### Starting position

The needles are in their starting position. The loop is in the front needle bed.



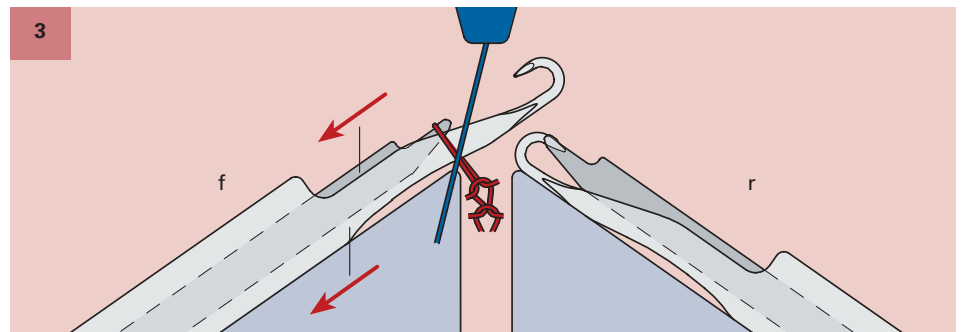
#### Rising of the needle body

Needle body and slider are being raised, the loop is being positioned onto the slider clips.



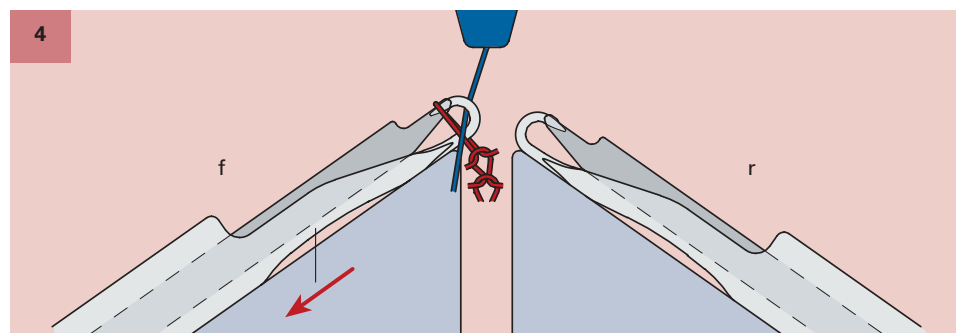
#### Lay in yarn

Needle body and slider are moving back, and the new yarn is laid into the hook.



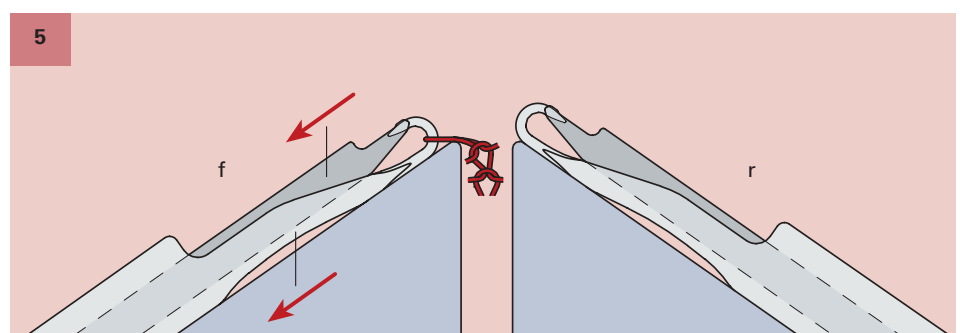
#### Casting off

The needle body moves back further thereby the latch closes the hook and the loop is placed onto the needle hook.



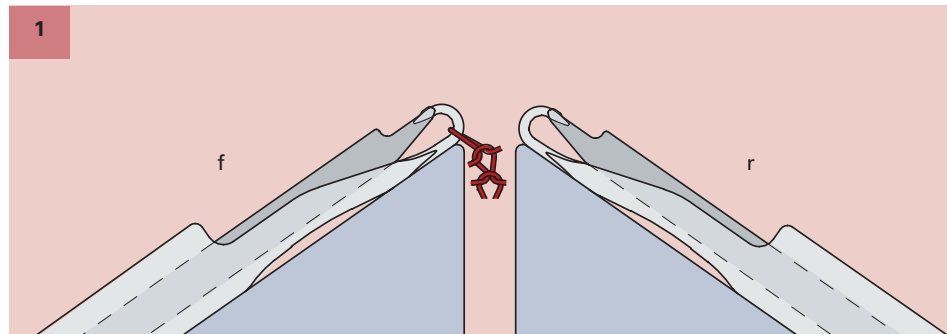
#### Knock over and loop forming

The needle body and the slider are moving back simultaneously. During this process the loop is knocked over and the size of the loop is determined by the stitch cam adjustment.



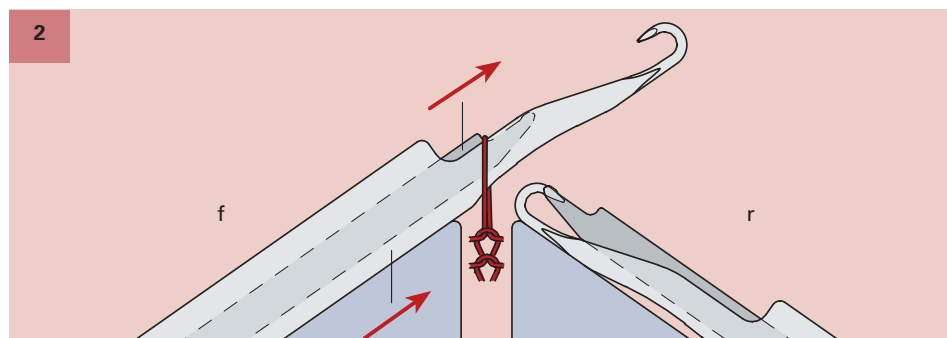
## TRANSFER PROCESS

### COMPOUND NEEDLE FOR FLAT BED KNITTING MACHINES



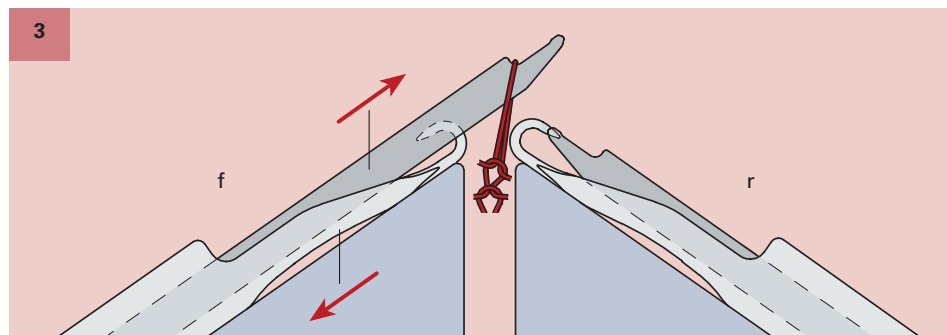
#### Starting position.

The needle is in its starting position.  
The loop is in the front needle bed.



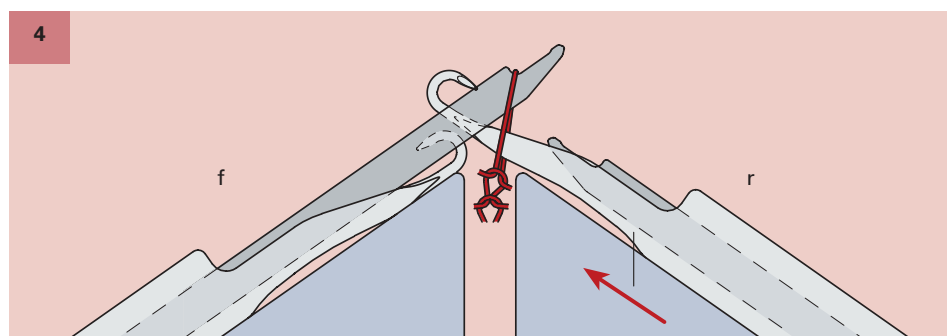
#### Rising of the needle

Needle body and slider of the transferring needle (f) are rising. The loop is thereby placed on to the slider clips.



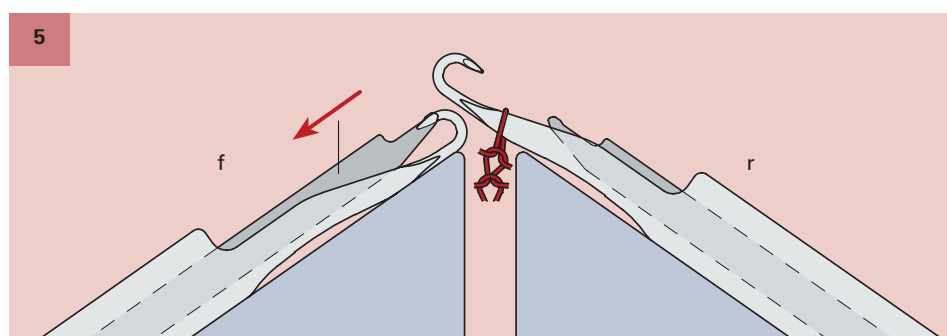
#### Rising of the slider

The slider of the transferring needle (f) is raised to its most forward position. The slider clips are passing the needle hook on either side, the loop is being spread and is ready to be transferred onto the receiving needle (r)



#### Transfer position

The needle body of the receiving needle (r) rises and the hook is moved through the slider clips of the transferring needle into the loop.



#### Transfer

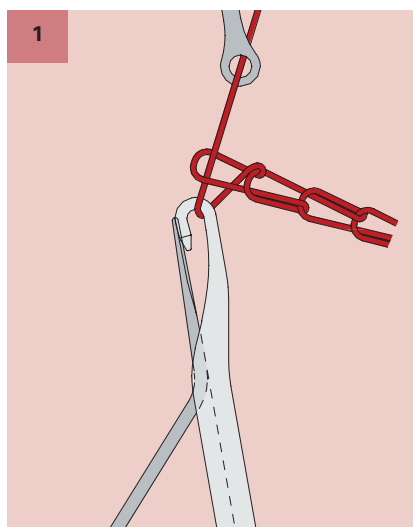
The slider of the transferring needle (f) moves back, the loop is thereby being transferred onto the receiving needle (r)

f = FRONT NEEDLE BED

r = REAR NEEDLE BED

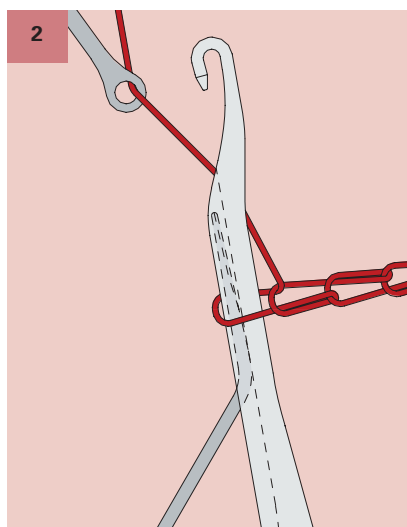
## LOOP FORMING PROCESS

### WARP KNITTING MACHINES WITH COMPOUND NEEDLES



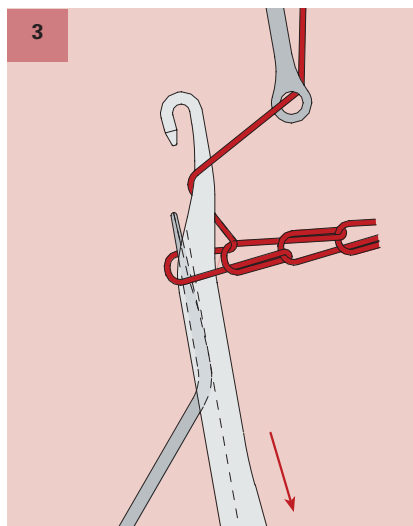
**Knock over position**

Needle body and closing element are in their lowest position. The closing element covers the needle hook. Guide bar fully forward in their underlap position. The guide bar is performing the underlap.



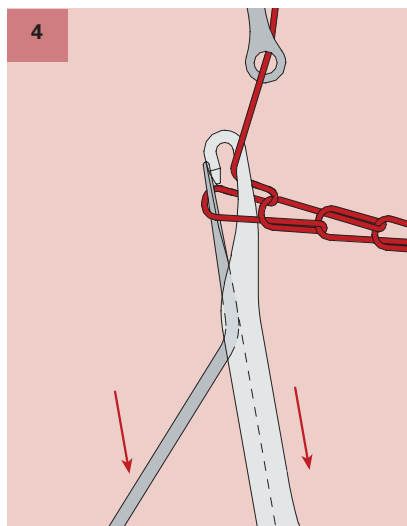
**Overlap of the warp threads**

The needle body and the closing element remain in their highest position. The closing elements rise but do not project out of the needle slots. The guide bar swings backwards to its rear most position the guide bar is performing the overlap.



**Catching the warp threads**

The guide bar swings forwards, the warp thread is laid into the hook of the needle as it is moving downwards. The closing element remains in its upper position and thus projects from the needle slot.



**Closing the needle**

Needle body and closing element move downwards together, thus the needle hook is being closed by the closing element and the loop slides from the needle shank onto the closing element.

#### Characteristics / features / advantages

- **Reduced needle stroke allows for higher machine speeds**
- **Due to the reduced looping angle higher loop density possible**
- **More transfer possibilities in the flat knitting area**
- **No scissoring**
- **Less problems with dirt build up on the warp knitting area.**