

Title (en)
Tilting punching device and method

Title (de)
Kippbare Vorrichtung und Verfahren zur Nadelung

Title (fr)
Dispositif et procédé d'aiguilletage inclinable

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Application
EP 07121867 A 20071129

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Abstract (en)

The needle punching apparatus for making non-woven materials from a fiber lap, comprises a frame, a unit for guiding a product e.g. fiber lap according to a forward longitudinal direction in a plane and a width of the product, a support (42) intended to carry a needle plate (1), actuating and guiding unit to activate the support so that the needles carry out a successive striking movement in the product with a main component, which is transverse to the plane, and a unit for defining an inclination of the main component. The needle punching apparatus for making non-woven materials from a fiber lap, comprises a frame, a unit for guiding a product e.g. fiber lap according to a forward longitudinal direction in a plane and a width of the product, a support (42) intended to carry a needle plate (1), actuating and guiding unit to activate the support so that the needles carry out a successive striking movement in the product with a main component, which is transverse to the plane, a unit for defining an inclination of the main component around an axis significantly parallel to the width of the product with respect to a normal level, and a unit for adjusting the inclination of the main component. The striking movement is a movement in closed loop defining the main component combined with a secondary component substantially parallel to the longitudinal direction of the product, and a substantially straight movement. The actuating and guiding unit comprises a unit for guiding a positioning pivot (49) linked to support according to a predetermined path. The inclination defining unit allows to define an orientation of the predetermined path, which is straight. The unit for guiding the positioning pivot comprises a slide, and a deformable quadrilateral having an intermediary rod connected to the support by an articulation in the positioning pivot and two guiding rods articulated each of a part with a respective end of the intermediary rod and other part with the frame along an anchor axis. The deformable quadrilateral is constituted by Watt's and Tchebycheff's mechanisms. The inclination of the main component is adjusted by the orientation of predetermined path. The anchoring axis is moved with respect to the frame to adjust the inclination of predetermined path and the orientation of the main component. The anchoring axis moving unit defines a path for the anchoring axis into an arc form of a circle centered on an axis parallel to the width of the product. The anchoring pivot displacement path is substantially in an arc form, which is centered on the axis of positioning pivot when the needle tips are at middle in the product. The anchoring axis moving unit comprises a guiding slide, and a unit for blocking a position of anchoring axis in the slide. The unit for guiding the positioning pivot is mounted on a turning plate around an axis parallel to the width of the product. The actuating unit comprises two actuating rods of which one part is connected with a respective crankshaft and other to the support of needle board by the actuating axis, where the two crankshafts turn in opposite direction from each other. A mutual angular setting of both crankshafts is adjustable. An outlet shaft is connected to the first crankshaft, and an inlet shaft is connected to an outlet shaft of motor. An angular adjustable element is intended to adjust a phase difference of the first crankshaft with respect to the second crankshaft. An independent claim is included for a needle punching process.

Abstract (fr)

Le dispositif d'aiguilletage comprend un bâti, des moyens pour guider (21, 23) un produit (22) selon une direction d'avance longitudinale (24) dans un plan définissant une direction longitudinale et une largeur du produit, un support (42) destiné à porter une planche à aiguilles (1), et des moyens (2, 3, 5-19) d'actionnement et de guidage pour actionner le support de façon que les aiguilles effectuent dans le produit un mouvement de frappe ayant une composante principale transversale au plan. Le dispositif comprend des moyens pour définir, par rapport à la normale au plan, une inclinaison de la composante principale autour d'un axe sensiblement parallèle à la largeur du produit. Le mouvement de frappe est de préférence sensiblement elliptique. Dans un mode de réalisation, le dispositif selon l'invention comprend un quadrilatère déformable relié à la planche, et des glissières pour modifier la position des pivots reliant le quadrilatère au bâti et ainsi régler une direction de guidage de la planche et l'inclinaison du mouvement des aiguilles. L'invention concerne aussi un procédé mis en oeuvre dans un dispositif selon l'invention. Utilisation pour optimiser l'interaction des aiguilles avec les fibres.

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