

Title (en)

APPARATUS AND PROCESS FOR DOWEL INSERTION TO CONCRETE PANEL JOINTS

Publication

EP 0117323 B1 19870826 (EN)

Application

EP 83300675 A 19830210

Priority

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Abstract (en)

[origin: EP0117323A1] A dowel insertion apparatus and process is disclosed for the insertion of a plurality of joining dowels between freshly poured and cured concrete panels. Each dowel (14) is grasped each by an individual inserter (17). Typically the inserter is mounted from a carrier and includes paired tangs (30) having female dowel receiving ends of arcuate configuration at the lower portion thereof which female arcuate ends precisely mate to and receive the dowels. These tangs are connected at a depth above maximum concrete penetration by an electromagnet (E). A vibrator (V) is attached to communicate vibrational energy to the inserter, this vibrator being chosen to have sufficient vibrational energy to fully liquefy the concrete. Dowel insertion includes positioning the paired tangs of each inserter over a steel and magnetic dowel, turning on the magnet and grasping a dowel by a precise fit at the female arcuate surfaces to the dowel. Thereafter, the dowel and inserter are positioned over a joint between two freshly poured concrete panels (10, 11). When insertion is to occur, the vibrators are turned on and the inserter lowered. Upon insertion to the concrete panel, the inserter and firmly grasped dowel liquefy the concrete in their downward passage and allow full depth penetration of the dowel in precise horizontal alignment to the referenced line and grade of the dowel insertion apparatus. At full depth, the vibrator is turned off and the dowel instantly becomes embedded in the freshly poured concrete as the lack of vibration solidifies the concrete relative to the dowel. When the inserter is withdrawn a short distance from the dowel, the vibration is recommenced with the vibrator fluidizing the concrete and filling any resultant voids. Vibration of the inserter continues until the inserter - at least in the vicinity of the female arcuate surface - is cleaned, such cleaning occurring by passage of the tangs over a wire brush. Upon withdrawal of the inserter at the downwardly protruding tangs, the finished surface of the concrete is substantially undisturbed. A dowel storage bin with distributing conveyor enables a row of inserters mounted to a carrier to distribute a plurality of dowels between two panels simultaneously, the dowels being evenly distributed the width of any expansion joint. A carrier for handling a group of correspondingly distributed inserters enables the disclosed mechanism to be operated off of a moving platform referenced to line and grade, such as a slip from paver, or on an independently mounted and moved frame. By synchronizing carrier movement so that speed relative to the ground is not present, dowel insertion along a joint after pouring can occur without disruption of paver movement.

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CPC (source: EP)

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Cited by

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