

Title (en)
OPTICAL BROKEN THREADS MONITORING DEVICE FOR TUFTING MACHINES

Publication
EP 0221546 B1 19890517 (DE)

Application
EP 86115346 A 19861105

Priority
DE 3539536 A 19851107

Abstract (en)
[origin: US4691647A] An optical thread breakage monitoring apparatus for tufting machines has a laser beam scanning apparatus (21). The retroreflecting strip (11) illuminated by this laser beam scanning apparatus (21) is secured above the eyes (12) of the needles (13) to the front side of the needle beam (14) (FIG. 1).

IPC 1-7
D05C 15/00

IPC 8 full level
D05C 15/16 (2006.01); **B65H 63/032** (2006.01); **D05C 15/00** (2006.01); **D05C 15/18** (2006.01)

CPC (source: EP US)
B65H 63/0324 (2013.01 - EP US); **D05C 15/18** (2013.01 - EP US); **B65H 2701/31** (2013.01 - EP US)

Designated contracting state (EPC)
BE CH DE FR GB IT LI NL SE

DOCDB simple family (publication)
EP 0221546 A1 19870513; **EP 0221546 B1 19890517**; DE 3539536 C1 19870619; DE 3663375 D1 19890622; JP S62125063 A 19870606; US 4691647 A 19870908

DOCDB simple family (application)
EP 86115346 A 19861105; DE 3539536 A 19851107; DE 3663375 T 19861105; JP 26413786 A 19861107; US 92437786 A 19861029