

Title (en)

Apparatus for detecting polluting matter in the fibre materials such as cotton or other

Title (de)

Vorrichtung zum Erkennen von Fremdstoffen in Fasermaterialien solchen wie Baumwolle oder anderen

Title (fr)

Dispositif de détection des matières polluantes dans les matières fibreuses telles que le coton ou autres

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Application

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Priority

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Abstract (en)

The appts. (2) to detect the presence of impurities in fiber materials, such as cotton and the like, is located between the bale breakers and the downstream fiber processing stations where it passes in front of an impurity ejection opening (3). The detection system is a combination of an optical detector (4) and an ultrasonic detector (5) across the material flow and upstream of the separator (6) which removes detected matter. The sorting machine is pneumatic with an air carrier channel (1) where the fiber material is transported by a flow of compressed air. The material is a mixture of air or fibers or a web, to move in front of the detector (2), and the impurities are ejected through an opening (3) in the channel (1). The fiber material can also be in the form of a web which is moved mechanically, such as by a feed drum or a conveyor belt. The fiber material can also be allowed to drop by gravity through a shaft, to build up at the bottom to be taken off for scanning. The feed drum or conveyor belt are of materials which absorb ultrasonic waves, and generate a command to separate and remove detected impurities. The detected matter is ejected by air jets under the perforated drum or belt, and be carried in the air streams to a facing collection system. The accumulated fibers at the base of a drop shaft build up in a supply bin or the like, to be moved passed the detector (2) and impurities are ejected through a channel opening (3). The optical detection system (4) has an array of lights to deliver light beams at the fiber flow in the channel (1) or at the mechanical feeds, to be registered by opposing light receivers which determine changes in contrast which occur through the reflection of light by impurities within the fibers. The ultrasonic detection system (5) has at least one assembly composed of a transmitter (5'), absorber (5) and receiver (5'), deployed at the fiber feed path. The transmitter delivers ultrasonic waves in a wavelength of ≤ 1 cm and at frequencies of 50-200 kHz. The ultrasonic transmitter has a long and thin shape, and the receiver (5') has a large number of small cells forming a surface area matching the shape and dimensions of the transmitter (5'). The bandwidth of each receiver cell is at least 4 kHz, forming the receiver (5'). The ultrasonic transmitter (5') has a width equal to that of the pneumatic carrier channel (1) or the mechanical fiber transport system. The individual receiver cells each have a reception surface area of max. 1 cm², next to each other without gaps, to form the receiver (5') across the width of the pneumatic carrier channel (1) or the mechanical transport system. The ejection system (6), for the detected impurities, is an assembly of jets across the width of the pneumatic carrier channel (1) or the mechanical transport, facing the ejection opening (3). The jets are operated by command signals derived from the detection of impurities at the optical detection system (4) or the ultrasonic receiver cells (5').

Abstract (fr)

La présente invention concerne un dispositif de détection des matières polluantes dans les matières fibreuses telles que le coton ou autres, équipant une machine de tri interposée entre une machine d'ouvroison et des machines de traitement en aval, dans laquelle la matière à trier est déplacée devant un dispositif (2) de détection des matières polluantes, qui sont éjectées à travers une ouverture (3) de la machine. Dispositif caractérisé en ce qu'il est essentiellement constitué par la combinaison de moyens (4) de détection optique et de moyens (5) de détection à ultrasons disposés transversalement à un flux de matière transportée depuis une machine d'ouvroison, en amont d'un moyen (6) d'extraction des matières polluantes, vers des machines de traitement en aval. L'invention est plus particulièrement applicable dans le domaine de l'industrie textile, en particulier le traitement de la matière brute après ouvroison et notamment le tri et l'élimination des matières polluantes dans le coton. <IMAGE>

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