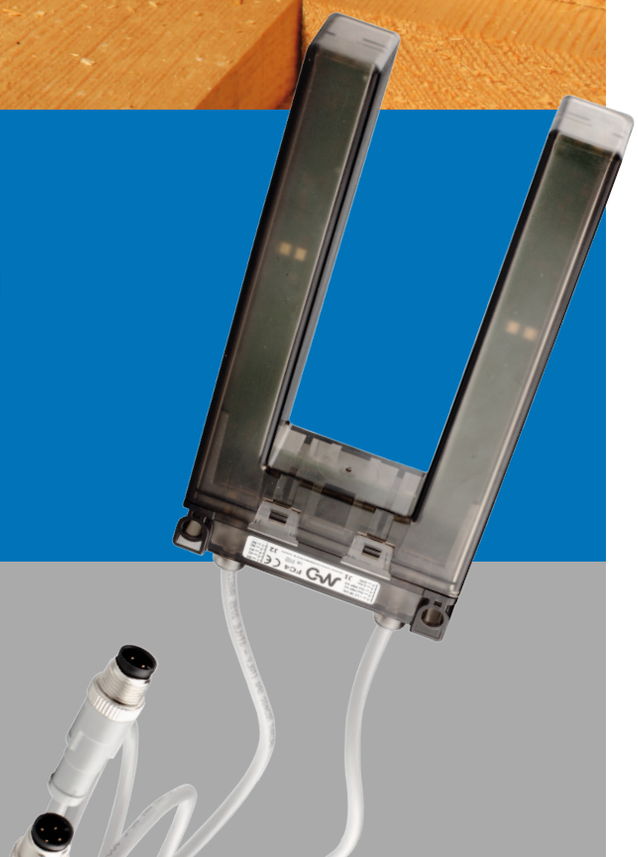
Micro Detectors

Italian Sensors Technology

Application:
Control of strap oscillation in the polishing machines

FC4 - Fork sensor for driving edge applications



Photoelectric Sensors

Application note

CAT3EFC1257201

Application note - FC4 - english - Ed.01/2012

APPLICATION SECTORS

Wood, plastic, rubber and metal processing.

Parquet production, flooring for the wood industry and wood processing, furniture and finishing furniture for the rubber industry and plastic products, panels for metals production industry and metal products.

PROBLEM DESCRIPTION

The polishing machines are typically equipped with a **strap programmed to oscillate continuously**, in order to ensure a uniform processing of the panel.
Specifically, the machine works by feeding the panel along a conveyor belt, below the polishing strap, as shown in Figure 1.
Since the raw material board could be more or less wide than the belt itself (Figure 2), it must be oscillating to ensure a **uniform polishing**.

Fig. 1

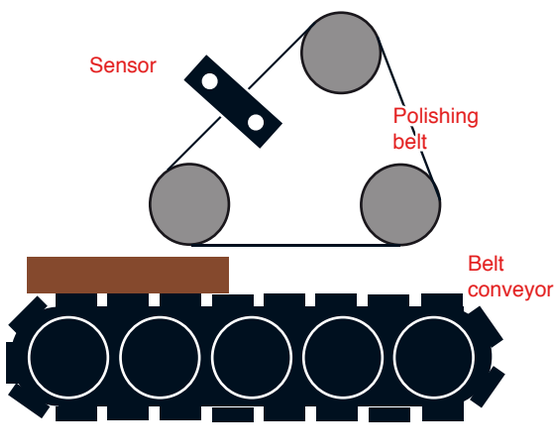
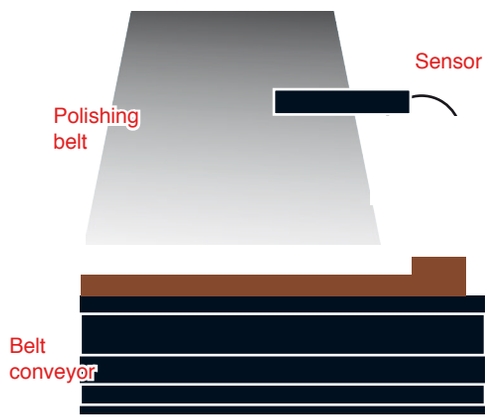


Fig. 2



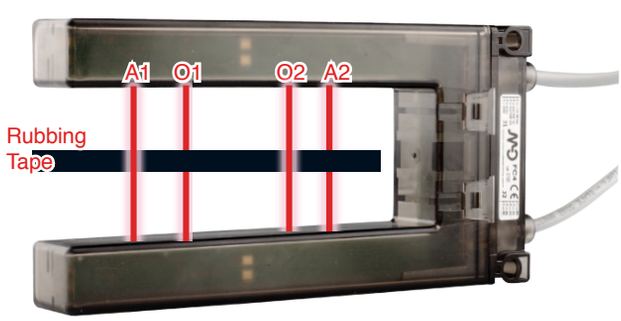
APPLIED SOLUTION

If the tape does not oscillate, the panel could take grooves. Furthermore, it is necessary to accurately control the width of this oscillation, sending an alarm signal to the operator in case the belt is moving differently from the normal working range with consequent **risks of machine breakdown.**
Moreover, these machines typically operate in high-fire-risk environments. Sudden movements of the belt may caus **potentially incendiary sparks** and, consequently, some **uncountable damages** for the whole company.

FC4 - Fork sensor for driving edge applications realizes the described control operations within 4 light beam emission (figure 3).

Description and function of beams:
- O1/O2, define the width of oscillation
- A1/A2, define alarms in case of uncorrect positioning.

Fig.3



- The A1 beam is always interrupted
- The tape, oscillating, breaks the O1 beam at first, and then the O2 beam
- At this point the output of the sensor commutes and the machine makes the belt move to the opposite side
- Consequently, the O1 and O2 beams are free
- Then the output commutes and the cycle begins again.

The right operation occurs when the tape oscillates alternately between the O1 and O2 beams, which, placed at a distance of 7mm, perfectly determine the oscillation width.

If the belt, however, stops the beam traced from the ray A1 or A2, it is out of position and the sensor stops the work alarming the operator.

The use of the FC4 sensor allows, therefore, **not to use micro-mechanical switches** (as normally used in this kind of application) to determine the alarm position; and you don't need to wire the both sides of the machine.
Moreover, the absence of micro switches makes easier the introduction of the belt in the machine, even by unskilled personnel.
A further advantage of the sensor comes from the use of two beams (O1/O2), which define properly the belt oscillation, and this allows the correct tapes detection in case of **fraying**, unlike the sensors that use only one beam.
This avoids, typically, the regulation pistons wear and also a **lower energy consumption.**

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