

AUXILIARY EQUIPMENTS FOR CIRCULAR KNITTING MACHINES

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The circular knitting machines from the new generation are inconceivable without professional auxiliary equipment. These equipments are conceived for all the zones of the knitting process, taking care to assure the conditions for controlling and establishing the work parameters, but also the ecological aspects. The auxiliary equipments, such as creels, yarn detectors, yarn meters etc are made by companies that produce knitting machines (MAIYER & CIE) or by companies specialized only in producing auxiliary equipments for knitting machines (MEMMINGER-IRO).

Introduction

New generation circular knitting machines are conceived with professional auxiliary equipment, that ensure material conditions for the high standard equipment functioning, high reliability and not the least the obtaining of high quality knit fabric.

Such auxiliary equipments were conceived for "problem" areas in the developing of the knitting process on the whole itinerary of the thread, respectively of the knit fabric obtained. There were taken into consideration the present ecological aspects, as well as the ensuring of the conditions for working parameters control and adjustment.

1) Lint Removal Equipments

The lint produced during knitting generates many negative aspects due to the depositing of different working organs of the machine. In this way, the auxiliary equipments companies produced different types of fans, blowing or inhaling devices, set in the exposed areas of the knitting machine: fontures, suppliers, surveying devices, creels.

The MEMMINGER-IRO company offers:

- the VINTI CLEANER model, that ensures the removal of the lint with the help of oriented fans, disposed on telescopic arms;

- the FN CLEANER model disposed at the level of eye production organs, formed of a ring with oscillating movement, with air blowing orifices.

The UNIWAVE company offers:

- the ROLL KLEEN model, that uses the 360 rotation movement round its axe fans;

- the SWEEP KLEEN model, that uses oscillatory movement fans with adjustable amplitude.

From the total of lint and dust, around 33% is formed at the level of the supplying creel, the rest being distributed on the portion between the creel and the knitting machine. Therefore the use of some creels in closed board shapes fixes the problem of the environment pollution only partially. Thus, there are modern systems of sucking up the pollutants directly from the formation area; they are forcedly taken over through the closed tubes, with air recycling after filtration.

The MEMMINGER-IRO company proposes the TOTAL LINT-CLEANER TLC model, that, when used together with a supplying creel in the shape of a closed board, can ensure the elimination of approximate 90% of the pollutants generated at knitting.

The SHELTON company proposes the LINTEX MACHINE CLEANING SYSTEM model that ensures filtered air absorption and recirculation, with complete isolation of the machine in a place with flexible and transparent "walls".

2) Oiling Devices

As the technical performances of the circular knitting machines grow (working speed, sharpness, system numbers, number of eye producing organs, etc) there was the need to ensure an oiling as efficient as possible for the circular knitting machines. This thing determined the continuous development of the oiling devices and/or their projection on the basis of new working performances.

The most efficient oiling devices are made by the companies: - MEMMINGER-IRO, that proposes a PULSONIC 4-MEDI model, that ensures the oiling with the help of an oil jet conducted under pressure, made with an electromagnetic pump.

-UNIWAVE, that offers the AUTO-FLUSH model which ensures the automatic temporized oiling (the time and the duration of the oiling), in order to put the last one at the end of the knitting bale, so as to effect as little as possible the quality of the knit fabric. The PROJECTILE 419 LUBRIFICATOR model of the same company ensures the oiling by projecting oil micro particles (dimensions 419 μ m) on the eye producing organs, after having passed through a helicoidally separation device.



The PULSONIC 5.2 is a pure pressure oiler. It facilitates accurate dosage of even minimum oil quantities per pulse and an optimum oil distribution in the machine. Depending on the specific requirements, different oil quantities can be easily adjusted for all machine parts to be efficiently lubricated. Due to its high working pressure, oil can be supplied to any desired position. The oil pressure furthermore effects the cleaning of the cam block segments. The oil consumption is reduced by more than 50 percent. The small oil quantity used leaves the knitting machine surfaces in a drier state, reducing lint deposits. In addition, the knitted fabric has far fewer oil stains and the annual oil consumption can be accurately calculated.

The oiler principle is based on a reciprocating-rotary piston. The lifting and rotary piston motion is controlled by a stepper motor. After the oiler starts up, the stepper motor turns the piston to lubricating point 1. By means of a sensor, the position of the unit can be determined.

The stepper motor turns the piston and the mechanical control element to the next lubricating point to be lubricated. The control element is magnetically locked by a limit stop. The stepper motor turns the screw positioned in the blocked control element by 90° in anti-clockwise direction. The downward piston stroke is 3 mm. 100 mm³ oil, e.g. with viscosity 22, in 24 pulse packages (segments), is supplied to the lubricating point.

After the lubrication process has been completed, the check valve in the oil channel is closed. The piston is lifted by a 90° clockwise revolution and the control element is unlocked. Due to the vacuum formation in the empty pump chamber, the inlet valve opens and oil flows into the pump chamber. The next lubricating point can then be addressed.

The PULSONIC 5.2 provides a maximum of 12 oiling outlets. The oil flow per lubricating point can be set between 0.3 and 24 ml/h.

The settings are made via the pushbuttons and shown on a clearly structured display.

The oil flow is individually controlled for each lubricating point. The machine is automatically stopped if the oil does not flow through the tube to the lubricating point.

Assured even oil distribution over the entire circumference of the cylinder
Accurate, individually programmable lubrication of all the needles, elements and cam boxes

Oil volume can be set separately for each lubricating point

Low oil consumption, since no oil is wasted at the lubrication points

No generation of harmful oil mists into the environment

Low power costs as no compressed air is required

Electronic monitoring of the supplied oil volume

Machine shutdown in case of malfunctions or clogged nozzles with a corresponding fault.

3) Thread Survey Devices

The survey devices have the role to survey the presence of the threads on the supplying itinerary, with automatic stop of the machine when the thread is broken or when there are some serious imperfections (knots). They can be set in different parts of the thread itinerary.

The MEMMINGER-IRO company offers various complex models that work by direct contact with the surveyed threads.

The BTSR company makes highly efficient models that control the threads without coming into direct contact with them: the electronic ST CK-J model that works by detecting the thread movement and IDS model – completely electronic that surveys by analysis of image variations.

4) Detection Devices for Knit Fabric Faults

Fault detection devices have the role to ensure the superior quality of the knit fabric obtained on highly productive circular machines.

Therefore, the MEMMINGER-IRO company made the LMWZ device for detecting knitting faults (holes, pinches, needle marks) and counts them on categories and time gap. This device has two parts: the detecting element that functions on optical principle (detects and analysis the light ray emitted by the device and reflected by the knit fabric) and the command unit equipped with a microprocessor that ensures the automatic stop of the machine in the event of a fault and the counting of these stops.

GIN HONG YU HARDWARE CORP. made the HPF model with similar functional role.

Conclusions

In conclusion, the highly effective circular machines are inconceivable without the auxiliary equipments that ensure a high reliability, high production and superior quality of the knit fabric.

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