

AUTOMATIC RING (YARN MACHINE) SPINDLE STOPPER

RELATED FIELD OF THE INVENTION

This invention is related to a spindle stopper which stops the spinning
5 spindle after yarn breakage.

PRIOR ART RELATED TO THE INVENTION

On the current ring yarn machines yarn is produced by winding up the
twisted strand on a cop which is on the revolving spindle. Spindle is revolving by
the help of driving belt which takes power from the main motor. If there is a yarn
10 breakage because of some reason, the spindle goes on revolving. Meanwhile
there is no yarn production

Since there is no sign or system in order to notice the breakage, the spindle
revolves in vain (without any yarn production) until the operator comes to realize
the breakage. By the breakage of the yarn(during the revolving of the spindle in
15 vain);

- the yarn which must have been produced flows through a pnomofil suction
canal and goes waste. Meanwhile until the operator joins the yarn by twisting,
the spindle revolves without any yarn production.
- since the yarn goes on revolving, the winding yarn on the cop with a free end
20 causes cotton flies by rubbing against some parts of the machine. These cotton
flies are loss of production and cause yarn breakages on the same machine or
on the other machines in the same room thus yarn breakage causes more then
one breakage and this increases the total number of breakages on the machine.
In order to take action to the increased number of the breakage in a short time
25 the number of operators around the machine must be increased since the
number of the operators are determined according to the standard number of
the breakages.
- when the number of the breakages exceed the standards, speed of machines
are decreased without paying attention to the loss of production in order to
30 make the machines run efficiently or make operators work overtime to deal with
less machines than usual to solve the problem.

- operators stop the spindles by lifting or lowering spindle brakes by their knees or hands manually according to the type of machines in order to make the necessary operations and then make them loose to twist the yarn again.

THE AIMS OF DEVELOPING OF THE INVENTION

5 By developing of this invention;

- when there is a yarn breakage, to make the revolving spindle stop immediately,
- to prevent other yarn breakages caused by broken yarn's cotton flies,
- to run the ring machine faster ,
- 10 • to decrease the number of operators per machine,
- to increase the efficiency (by increasing the productivity),
- to reduce costs,

are aimed.

EXPLANATION OF FIGURES

15 In order to explain the spindle stopper improved by this invention more clearly, some figures are presented on the appendix. The below is the definitions of the Figures.

FIGURE 1- General view of the spindle mechanism

FIGURE 2- General view of some parts of the spindle stopper mechanism

20 FIGURE 3- View of the spindle stopper ready to montage on ring (yarn) machine

FIGURE 4- demontaged view of the spindle stopper

FIGURE 5- Demontaged view of the parts of the spindle stopper during the montage on vater machine

25 FIGURE 6- Perspective view of the cylindrical metal which faller wires winded around to maintain magnetic field

FIGURE 7- Perspective view of the inserting metal which stated on the Figure 9 moving by the help of metal guide in the centre

FIGURE 8- Perspective view of the cover part of the box which makes the magnetic coiled wires insert into the covered box (used with Figure 11)

5 FIGURE 9- View of the inserting metal and its top which moves forward and backward in the magnetic field

FIGURE 10- Perspective view of the rear box which makes the magnetic coiled wires insert into the covered box

FIGURE 11- Perspective view of the brake arm which applies pressure to make the spindle stopper run

10 FIGURE 12- Perspective view of the lock system which makes the brake locked during the movement of brake arm on Figure 11

FIGURE 13- Perspective view of the connection component

EXPLANATION OF PARTS – COMPONENTS - FEATURES

15 In order to explain the automatic ring (yarn) machine spindle stopper improved by this invention more clearly, all the parts that form the components of the invention are numbered separately.

1- Main connection part

2- Coiled part

20 3- Exterior part of coiled part

4- Front cover of the rear box which covers magnetic field coiled in itself

5- Rear box which covers magnetic field coiled parts

6- Inserting Metal

7- Stopping arm

25 8- Plastic part

9- Metal weight

10- Stopping arm connection part

11- Stopping arm rear connection part

12-Stopping arm T-shaped canal

13-Stopping arm I- shaped canal

14-Inserting metal top (head)

15-Connection component

5 EXPLANATION OF THE INVENTION

The main components of the automatic ring (yarn) machine spindle stopper improved by this invention are below.

- Magnetic field coil
- Inserting metal (6) and its top (14)
- 10 - Locking mechanism (8 and 9)
- Stopping arm (7)
- Connection component (15)

Magnetic field consists of coiled part (2) exterior part of the coiled part (3) rear box which covers the magnetic field coil (5) and a cover (4) . In order to make
15 magnetic field, the coiled part is covered by wires. Magnetic field coil (1) makes magnetic field in order to give movement to the inserting metal (7).

Inserting metal (6) contains a plastic top (14). This plastic top (14) is to protect it from dust. The working principle of inserting metal is to move forward and backward inside the magnetic field. When there is a magnetic field, the inserting
20 metal (6) is pulled inside by this magnetic field to make the stopping arm (7) work. Thus knocking mechanism (8 and 9) stops the spindle by the stopping arm (7) which applies brake. The working principle of this part is to pull the metal part into the magnetized part by making magnetic field.

Locking mechanism which is shown on the Figure 12, consists of plastic part
25 (8) and preferably ball-shaped metal (9) weight. Locking mechanism is connecting to a stopping arm (7) which works by the movement of inserting metal (6) when the stopping arm (7) makes a move, the T canal (12) on the brake mechanism also makes a move by the help of weight on it and make the mechanically locked. During this time the energy is cut off and the lock becomes mechanically on.

Stopping arm which is shown on the Figure 11 (by rear connection part arms shown on the Figure 11 squeeze the spindle) is the part which makes the spindle stop. These are made by the ring machines producers on the stopping arm (7). There is a plastic part (that contains T and I shaped canals (12 and 13) which makes the manuel locking) which is pulled and pushed by inserting metal (6) to give a movement to the brake apparatus. The brake apparatus is a part on the machine.

The Main connection (1) is a metal component which is used to assemble the ring machine spindle stopper - improved by this invention- to the ring machine. The parts which mentioned above are assembled on to the main connection part (1) (Figures 1,2,3,4 and 5). These parts are assembled to the ring machine after joining together on the main connection part (15).

Connection component (15) which is a plastic part with canals and bolt holes on it is a mechanism to obtain the other components assembled to the machine.

The breakage sensor which is used to determine the number of breakages because of any reason during the production of yarn on the ring machine works in the principle pf detecting the traveller (Travellers make the yarn wind up on to kops)'s speed. As for as the traveller's speed higher than 2400 RPM, no information is sent to the main board. If the speed is below the limit 2400 RPM, information is sent to the main board.

With this information the main board send energy from it's own electronic component to the coiled part (2). During this time magnetic field makes magnetic field on the coil. Then the inserting metal that gives movement to forward and backward is pulled into the centre of magnetic field by the magnetic effect. Since the stopping arm (7) attached to the inserting metal (6) is pulled into the centre, the locking system (Figure 12) moves through the T canal on the stopping arm and locks the spindle. Meanwhile the energy of the system is cut off, and the system works by the method of mechanical locking. Operator prepares the yarn system of this spindle and release the metal weight (9) loose by his hand in order to give way to the yarn twisting process. In this case brake mechanism turns into it's first situation since the magnetic field is not on.

CLAIMS

- 1- Automatic ring spindle stopper which stops the revolving spindle after yarn breakage and characterized by comprising of magnetic field coil, inserting metal (6) and it's top (14) locking mechanism (8 and 9), stopping arm (7), main connection part (1) and connection component.
- 2- Automatic ring spindle stopper as claimed in the Claim 1 and characterized by magnetic field coil comprising coiled part (2) exterior part of the coiled part (3) rear box which covers the magnetic field coiled wires (5) and box cover.
- 3- Automatic ring spindle stopper as claimed in Claims 1 or 2 and characterized by comprising the coiled part with wires in order to make magnetic field.
- 4- Automatic ring spindle stopper as claimed in the Claim 1 and characterized by having plastic top on the head of inserting metal and being able to move forward and backward in magnetic field.
- 5- Automatic ring spindle stopper as claimed in the Claim 1 and characterized by locking mechanism comprising plastic part (8) and preferably ball-shaped metal weight (9).
- 6- Automatic ring spindle stopper as claimed in the Claim 1 and characterized by having T and I shaped canals (12 and 13) which makes the manuel locking on the stopping arm .
- 7- Automatic ring spindle stopper as claimed in the Claim 1 and characterized by plastic part with canals and bolt holes on it which mechanism will be assembled.
- 8- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by assembling magnetic field coiling, inserting metal (6), stopping arm (7) and locking mechanism on the main connection part (1).
- 9- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by having more than one magnetic field coil, inserting metal (6) stopping arm (7) and locking mechanism (8 and 9)

10- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by magnetized effect which is formed by the magnetic field when the breakage sensor (which is used to determine the number of breakage because of any reason during the production of yarn) sends energy to the main coiled part (2) and during this time inserting metal (6) which gives movement forward and backward is pulled into the centre.

11- Automatic ring spindle stopper as claimed in Claim 1 and characterized by the inserting metal (6) is moving forward backward without any deviation from the centre by the help of exterior part of the coiled part (3) which works as a guide.

12- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by the stopping arm (7) attached to the inserting metal (6) is pulled into the centre the locking system moves through the T canal (12) which is on the stopping and locks the spindle.

13- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by being cut off the energy during the locking and making the locking mechanically.

14- Automatic ring spindle stopper as claimed in any one of the previous claims and characterized by releasing the metal weight (9) loose by hand to give way to the yarn spinning process.