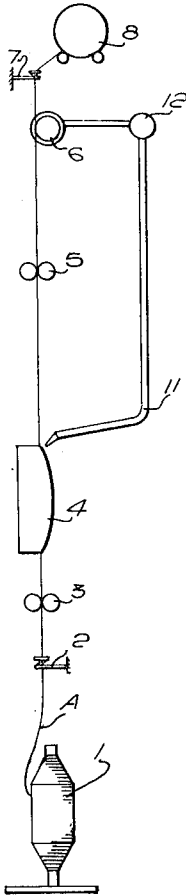


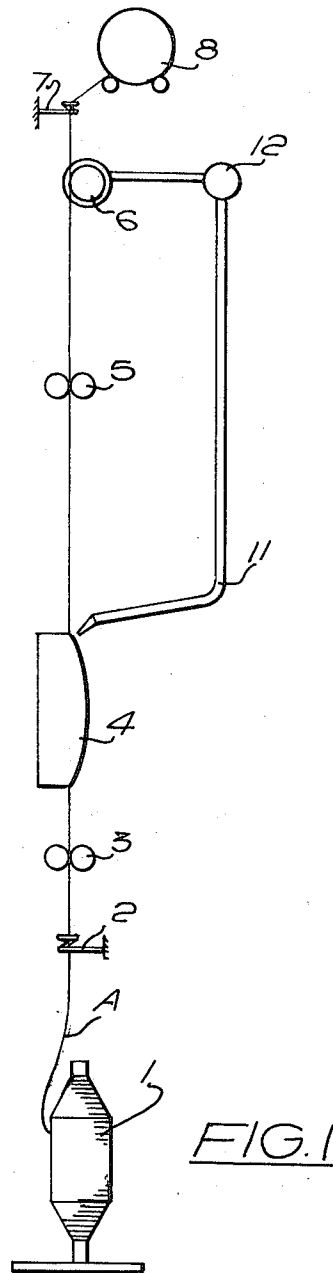
[54] **MACHINES ACTING ON CONTINUOUSLY
RUNNING TEXTILE YARNS**
[75] Inventor: **Frederick Hugh Howorth**, Withnall,
England
[73] Assignee: **Howorth Air Conditioning Limited**,
Bolton, England
[22] Filed: **Dec. 5, 1972**
[21] Appl. No.: **312,318**
[30] **Foreign Application Priority Data**
Dec. 9, 1971 Great Britain 57162/71
[52] **U.S. Cl.**..... **57/34.5, 57/34 HS**
[51] **Int. Cl.**..... **D02g 1/02, D01h 11/00**
[58] **Field of Search**..... **57/34 HS, 34.5;**
242/35.6 R, 35.6 E, 37 R, 35.5 A;
19/2, 263

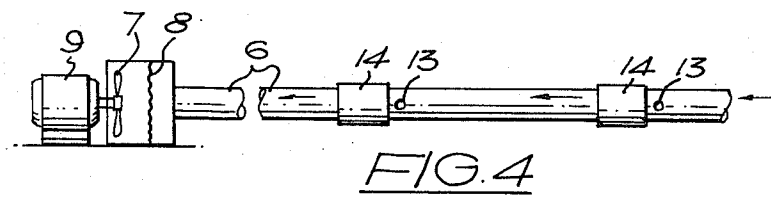
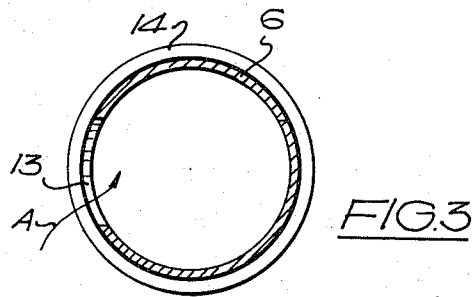
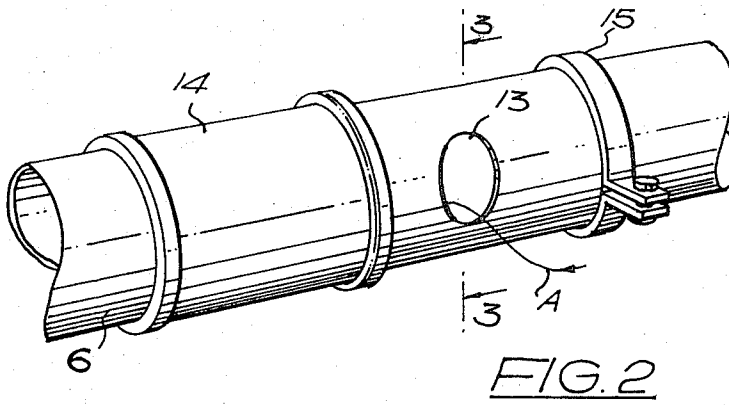
[56] **References Cited**
UNITED STATES PATENTS
3,066,471 12/1962 Scragg 57/34.5
Primary Examiner—John Petrakes
Attorney, Agent, or Firm—Norris & Bateman

[57] **ABSTRACT**
A suction apparatus for a machine for processing continuously running textile yarns to enable bobbins to be doffed without stopping the machine in which one end of a doffer tube or tubes is connected to a high pressure low volume suction fan, the tube being formed with a plurality of regularly spaced holes throughout its length to receive yarns ends and a plurality of resilient sleeves on the tube one adjacent each hole to seal the holes when not in use for carrying away yarn ends during doffing and when an end breaks.

1 Claim, 4 Drawing Figures







MACHINES ACTING ON CONTINUOUSLY RUNNING TEXTILE YARNS

The invention relates to improvements in machines acting on continuously running textile yarns and more particularly for enabling full bobbins in such machines to be exchanged for empty bobbins without stopping the machine of the type in which a suction tube or tubes extend the length of the machine to take away broken ends or yarn during doffing.

It has been proposed to provide suction means disposed in the vicinity of the path of a yarn in its movement through the machine towards a take-up package, such suction means comprising a suction tube having an inlet hole therein adjacent the path of said yarn, a yarn receiving container connected to the suction end of said tube and a suction source connected to exhaust said container whereby, if the yarn is severed beyond a point corresponding to said hole toward the take-up package, the free end of the yarn being fed is drawn into the hole and the yarn is continuously drawn into said container as it is fed, and means cooperating with said suction tube for optionally closing said inlet hole thereof.

It has now been found that yarn tensions or the speed at which a doffing system can convey the yarn depends on the velocity of air in the tube.

According to the invention a suction apparatus of the type referred to comprises a high pressure low volume suction fan connected to one end of a doffer tube, a plurality of holes in the tube arranged at intervals throughout its length, a sleeve of synthetic rubber or other resilient material mounted on the tube adjacent each hole to seal the holes when not in use for carrying away yarn ends during doffing.

The invention will be described with reference to the accompanying drawings:

FIG. 1 is a schematic elevation of a layout of the apparatus showing the passage of a single yarn;

FIG. 2 is a detail perspective view of a suction tube;

FIG. 3 is a transverse section of line 3—3 FIG. 2;

FIG. 4 is a side elevation showing a suction tube connected to a suction fan.

A machine for continuously processing yarn A is constructed with a plurality of bobbins arranged in rows side by side and one such bobbin 1 is shown in FIG. 1 by way of example. The yarn is drawn from the bobbin through guide eyes 2 by feed rollers 3 and feed through a heater 4 by further rollers 5 and over a suction tube 6 on its way through a further guide eye 7a to a take up bobbin 8a. The suction tube 6 may be connected at one to a two stage suction fan 7 arranged in a filter chamber 8, the fan 7 being driven by a motor 9, or the tube 6 may be connected to a header 12 connecting with the fan chamber. Any fumes from the heater may be exhausted through a pipe 11 being connected to the header 12 all in known manner.

The fan 7 applying the suction to the pipe 6 or header 12 is a high pressure low volume exhaust fan, for example, 80 inches W.G. at 400 cubic feet per minute, and the increased pressure over fans employed in known machines allows for a reduction in the diameter of the suction tubes 6 and of holes 13 therein with an in-

creased air velocity through the tubes 6. It has been found that with a tube 6 of 1 inch diameter the holes 13 should be 0.5 inches in diameter.

A slide 14 in the form of a sleeve is provided on the tube 6 adjacent each hole 13 to close or open the hole, the slide when closing the hole engaging a stop ring 15 clamped on the tube.

In order to prevent air leakage between the tube 6 and the slide 14, the slide is formed of a flexible, preferably synthetic rubber or other similar material sufficiently pliable to be drawn slightly into the hole 13 due to the high fan vacuum, thereby making a positive seal around the perimeter of the hole and permitting the use of a high pressure low volume fan without any significant increase in consumed horsepower.

The increased velocity of the air in the tubes of the hereinbefore described construction increases the efficiency of the suction apparatus by providing a substantially consistent and much higher yarn tension along the full length of the tubes and in doing so has increased the performance by substantially ten times over that of the existing system for substantially the same horsepower consumption.

Two suction tubes 6 are preferably employed, one for each side of the machine, with holes 13 therein positioned at, say, 9 inches apart along the length of 50 foot tube.

When the machine is running and a full bobbin is required to be replaced by an empty bobbin the yarn is broken and the free end is inserted into a hole 13 until the bobbin is changed so that the yarn is drawn along the tube 6 until an operator again breaks the yarn and transfers the end to the new bobbin, thereby preventing an accumulation of yarn during bobbin changing. The yarn tension in the tube varies along the length of the tube and by increasing the yarn tension at the holes such provides a more constant tension along the full length of the tubes, and by preventing leakage at the holes when not in use this greater efficiency is obtained without substantial increase in the power consumption.

What I claim is:

1. A suction apparatus for a machine for processing continuously running textile yarns to enable bobbins to be doffed without stopping the machine the invention comprising a suction tube formed with a plurality of holes therein spaced along the length of the tube, low volume high suction means connected to one end of said tube, and a sleeve of resilient material slidably mounted on the tube adjacent each hole for selectively covering and sealing the holes not in use for carrying away yarn ends during doffing and when an end breaks, each said sleeve being sufficiently pliable that when in position to fully cover the associated hole the sleeve is deformed by the suction within the tube into positive sealing contact all around the perimeter of the hole, said suction tube being about 1 inch in internal diameter, said holes each being about one-half an inch in diameter, and said suction means operating to draw air through said tube at a pressure of about 80 inches W.G. and a velocity of about 400 cubic feet per minute.

* * * * *