

- [54] **THREAD SUCTION TUBE CONNECTION**  
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[22] Filed: **Dec. 14, 1973**  
[21] Appl. No.: **424,748**  
[44] Published under the Trial Voluntary Protest Program on January 28, 1975 as document no. B 424,748.

[30] **Foreign Application Priority Data**

Jan. 17, 1973 Italy ..... 47751/73

- [52] U.S. Cl..... 57/34.5; 57/106  
[51] Int. Cl.<sup>2</sup> ..... D01h 5/68  
[58] Field of Search ..... 57/34.5, 56, 106, 107;  
  19/139, 263

[56] **References Cited**

## UNITED STATES PATENTS

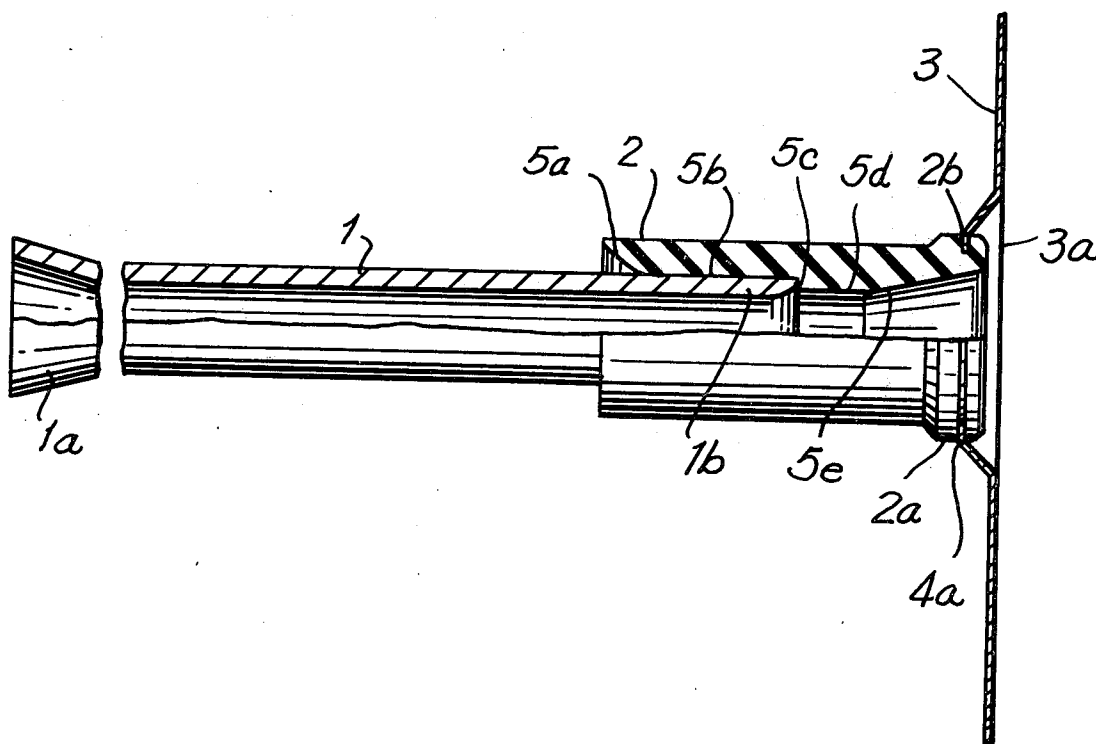
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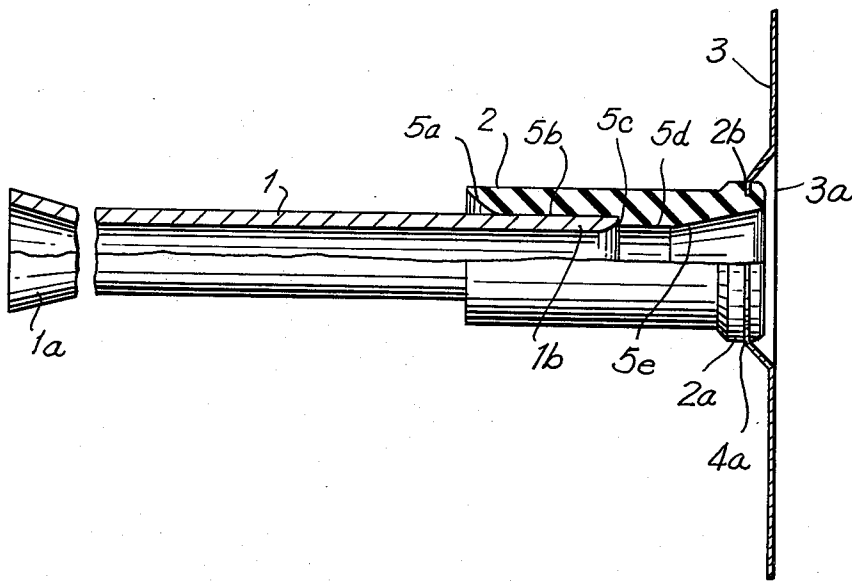
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[57] **ABSTRACT**

A system for connecting a thread suction tube to a tube carrier communicating with a suction channel and for disassembling it therefrom characterized by the fact that it comprises in combination a suction tube having an axial smooth bore with a flared inlet orifice and which is made of an antistatic rigid material, and a tube carrier constituted of a shaped sleeve made of an elastically deformable material. The sleeve has an axial conduit comprising a flared end adapted to facilitate the insertion of the rear end of the suction tube and which is provided with a radius generating a slightly conical section, the diameter of the more restricted cross sectional area is less than the outer diameter of the suction tube. The conical section ending with an annular shoulder, the inner edge of which defines the entrance of a cylindrical section of said conduit, and it is provided with a diameter substantially equal to the inner diameter of the suction tube and it has a flared end. Means are also provided to sealingly connect the said tube carrier to an orifice provided in the side wall of the suction channel.

## 2 Claims, 1 Drawing Figure





# THREAD SUCTION TUBE CONNECTION

The present invention relates to a system for connecting a tube designed to suck broken threads of a spindle associated therewith, with a tube carrier communicating with the suctional channel. The system enables the automatic assembly of said suction tube on its tube carrier in the proper position, without the use of clamping means, and said system also permits the quick and easy disassembly of the tube from its tube carrier. This suction tube is formed of a cylindrical hollow body having inner smooth walls, while the tube carrier is constituted of a shaped sleeve made of an elastically deformable material, and said sleeve having an axial conduit forming a seat to receive and elastically lock the tube end, in a predetermined position. The locking system of the parts insures a perfect seal connection therebetween, due to the particular shaping of the tube carrier and to the elastic effect of the material of which said tube carrier is made.

The experience gained in the practice of the spinning machines has proved that obstructions of the suction tubes due to the breakage of the thread of the associated spindle can be the cause of thread breakage on the adjacent spindles as well as of the formation of thread coils about the drawing roller, which negatively affect the working cycle and the product. These obstructions are commonly eliminated by clearing said tubes by means of tube brushes having rigid bristles, which can scratch the inner surfaces of said tubes so that further obstructions are made easier. Further with conventional suction tubes, provision is made to mount each tube on one of the connections of the suction channel by locking said tubes by means of tie springs which cause deformations of the inner conduits of said tubes which are another cause of fibre entanglement.

The accompanying drawing containing a single view, shows an example or an embodiment of the invention, wherein the tube, its tube carrier and a part of the suction channel are shown partly in a side elevational view and partly in a sectional view which has been taken along a plane passing through the common axis of the tube and tube carrier and which is set at a right angle to the axis of the suction channel.

As shown therein, a suction tube 1 made of an anti-static rigid material and having an inner smooth axial hole is provided with a flared inlet orifice through which the filaments are sucked. A tube carrier 2 is constituted of a shaped sleeve having an axial conduit comprising a flared orifice 5a to make the introduction of the tube 1 therethrough easier. The flared end 5a is provided with a radius generating a slightly conical section 5b, the more restricted area of which has a diameter which is slightly less than that of the outer diameter of the tube 1. The section on 5b ends with a shoulder 5c, after which follows a cylindrical section 5d having a diameter substantially equal to the inner diameter of the axial hole of the tube 1. The section 5d blending to

a flared end portion 5e, designed to be received into an orifice 3a arranged in the side wall of a suction channel 3. Around the circular orifice 3a is provided an outer flange 4 extending towards the inner space defined by the orifice 3a. In order to be co-operatively associated with said flange 4, the sleeve 2 is provided with an outer collar 2a, and said sleeve 2 being made of an elastically deformable material, such as synthetic rubber or the like.

In the collar 2a, a peripheral groove 2b is arranged to receive the free edge of the flange 4. For such a purpose the collar 2a must be forced to pass beyond said edge until this latter enters said groove 2b. Then, due to the elastic effect of the material, the sleeve remains sealingly connected to the suction channel wall. Thus, for assembling the tube 1, its rear end 1b is forced to enter the conduit length 5b so as to elastically deform the wall of this portion of the tube carrier 2. As the rear end 1b of the tube 1 comes into contact with the shoulder 5c, the tube cannot move further or be displaced forwards and therefore the elastic material constituting the tube carrier 2 due to its natural condition, sealingly locks the tube 1 into the tube carrier 2.

Disassembly can be performed by forceably removing the tube 1 from the tube carrier 2, overcoming the elastic action of the sleeve 2 which frictionally holds in a tight manner the tube 1.

I claim:

1. A thread suction tube and a tube carrier adapted for communicating with a suction channel of a spinning machine comprising in combination: a suction tube having an axial smooth bore with a flared inlet orifice and which is made of an antistatic rigid material, and a tube carrier shaped in the form of a sleeve and made of an elastically deformable material; said sleeve having an axial conduit comprising a flared end adapted to facilitate the insertion of the rear end of the suction tube and which has a radius forming a conical section, the diameter of the more restricted cross-sectional area is less than the outer diameter of the suction tube; said conical section ending with an annular shoulder, the inner edge of which defines the entrance of a cylindrical section of said conduit, having a diameter substantially equal to the inner diameter of the suction tube and having a flared end; and means being provided to sealingly connect the said tube carrier to an entrance orifice provided in the side wall of the suction channel.

2. The combination according to claim 1, wherein the tube carrier has an outer collar near its end, opposite to the end through which is inserted the suction tube, and an annular groove is provided in said collar to receive the free edge of a flange extending towards the inside and projecting from the channel wall about the said entrance orifice; and said flange being so shaped and positioned that its inner edge can enter said peripheral groove of the collar of the tube carrier due to the elastic effect of the material forming said tube carrier sleeve.

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