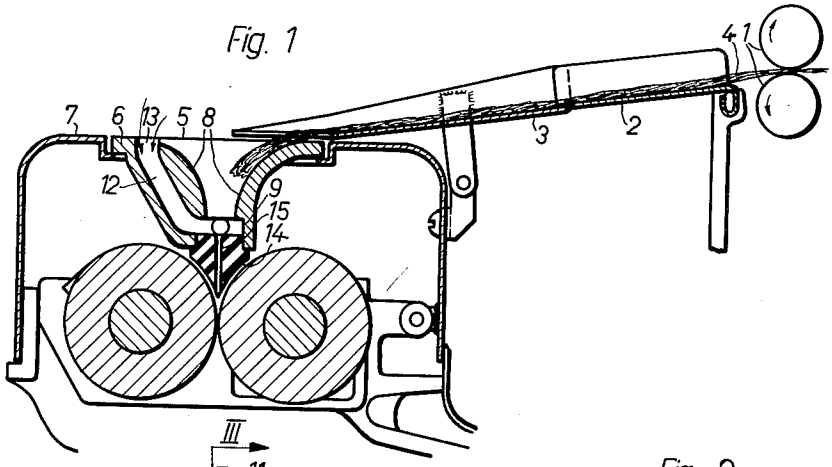
May 22, 1962 W. NAEGELI ETAL 3,035,313

CONDENSING TRUMPET

Filed Dec. 9, 1959

Fig. 1



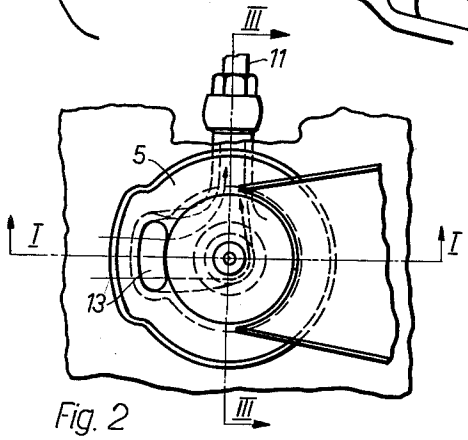


Fig. 2

Fig. 3

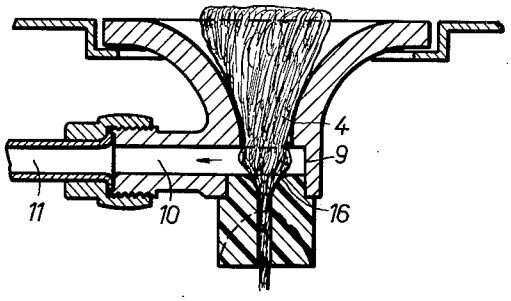
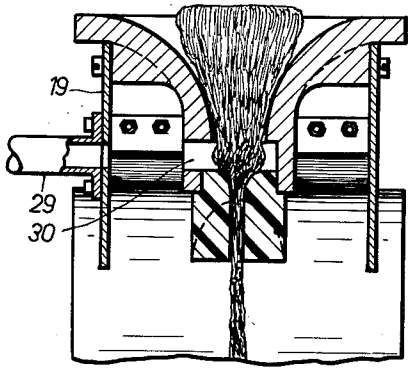


Fig. 5



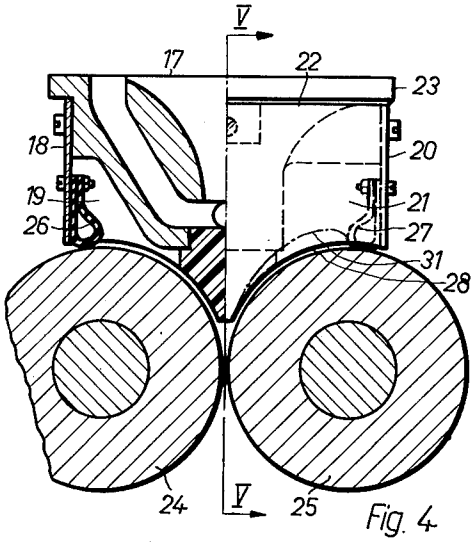


Fig. 4

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CONDENSING TRUMPET

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The present invention relates to a condensing trumpet arrangement for use in preparatory drafting arrangements of spinning machines.

Conventional condensing trumpets or funnels have a cross section which is continuously reduced in the direction of the movement of the strand passing through the funnel. This configuration is satisfactory for strands, roving, or slivers moving at conventional speeds. At greater speeds, the air carried along with the strand has not enough time to escape when the strand is compressed. Since the strand is not completely homogeneous, the air moves to localities where the flow resistance is relatively small, tearing individual fibres and small fibre tufts out of the strand and throwing same out of the funnel inlet. These fibres or tufts settle in the vicinity as fly or on the oncoming strand, disturbing the homogeneity of the strand. This is very undesirable.

It is the object of the present invention to provide an inlet funnel or trumpet arrangement for drafting arrangements whose flow area is continuously reduced to a suitable flow area, the subsequent flow area being substantially enlarged and followed by a relatively small bore. The air in the strand which is taken along into the trumpet is released in the large flow area following the trumpet before the strand enters the bore.

The enlarged cross sectional portion or cavity following the trumpet preferably communicates with a space in which there is a relatively low pressure. In this way, impurities and fly whose ejection from the strand is unavoidable, are withdrawn from the enlarged portion of the passage of the strand through the condenser.

The novel features which are considered characteristic of the invention are set forth with particularlity in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of embodiments thereof when read in connection with the accompaning drawing, in which:

FIG. 1 is a cross sectional view of a strand inlet apparatus of a preparatory drafting arrangement. The section is made along line I—I of FIG. 2.

FIG. 2 is a plan view of the inlet portion of the apparatus shown in FIG. 1.

FIG. 3 is a longitudinal section of the trumpet arrangement forming part of the apparatus shown in FIGS. 1 and 2, the section being made along line III—III of FIG. 2.

The left side of FIG. 4 shows a longitudinal section of a modified trumpet arrangement according to the invention, the right side of FIG. 4 being an elevation of this trumpet arrangement.

FIG. 5 is a longitudinal sectional view of the trumpet arrangement shown in FIG. 4, the section being made along line V—V in FIG. 4.

Referring more particularly to FIG. 1 of the drawing, numeral 1 designates a pair of delivery rollers supplying a fibrous strand 4 to a trough 2 having a tiltable portion 3. The latter guides the strand 4 to an inlet trumpet or funnel 5. The latter has a rim portion 6 resting on a stationary cover 7 and has a circular cross section whose size is gradually reduced to form a funnel or trumpet channel 8 whose smallest diameter corresponds substantially to the diameter of the slightly condensed strand 4. In this way the strand is not compressed while passing through the trumpet so that no air enclosed in the strand will escape upwardly, producing the undesired conditions described in the outset of this specification.

The trumpet channel 8 is followed by a considerably enlarged passage portion or cavity 9 which permits radial expansion of the strand all around. A suction channel 10 communicates with the cavity 9 and is connected through a conduit 11 with a space in which the air pressure is substantially lower than the pressure in the space 9. An air inlet channel 12 is connected to the cavity 9 which channel has an inlet 13 adjacent to the inlet of the trumpet channel 8 and located substantially diametrically opposite the delivery end of the trough portion 3. The bottom of the enlarged space 9 is closed by an insert 14, preferably made of synthetic resin and having a small diameter bore 15 coaxial of the trumpet channel 8. The inlet 16 of the bore 15 is slightly flared or rounded. The part 14 is preferably in the form of an individual interchangeable member.

The trumpet arrangement according to the invention operates as follows:

The strand 4 received in the channel 8 is just so much condensed that the lower end of the channel 8 is closed (FIG. 3). To achieve this, the flow areas of the channel 8 must correspond to the type of strand to be worked and can easily be found by experiments. The strand leaving the channel 8 passes through the cavity 9 into the bore 15 of the insert 14 where the strand is compressed to its final state. This causes a damming of the air contained in the strand at the inlet 16 of the bore 15. The enlarged space 9 permits unhindered lateral exit of the air from a relatively great circumference without tearing out or taking along good fibres, because the strand is held all around below and above the enlarged space 9. Impurities which may still be present in the strand and very short useless fibres are thrown into the cavity 9 and seized by the air flowing from the channel 12 into the channel 10 and carried away.

The strand running in the trough 3 usually loses some fibres which are carried towards the inlet of the trumpet channel 8 by the weak air current developing adjacent to the strand. Such fibres are seized in the arrangement according to the invention by the air entering the inlet 13 of the channel 12 and are carried through the channel 10 into the conduit 11 and removed.

The modified trumpet arrangement shown in FIGS. 4 and 5 includes a trumpet member 17 provided with a casing 22 formed by four plain sheetlike walls 18, 19, 20, 21 which are bolted to suitable outside surfaces of the trumpet member 17. A flange 23 at the top of the trumpet is rectangular. The walls 18 and 20 have lower edges adjacent to the rollers 24 and 25 and provided with bent rubber skirts 26, 27 which slightly press against the rollers 24 and 25, wiping fibres from the rollers and sealing the inside of the casing 22 to the outside along the rollers. The lower edges of the walls 19 and 21 are conformed to the rollers 24 and 25, defining a downwardly converging space inside the casing. The lower edges of the walls 19 and 21 are adjacent to the rollers, leaving only a narrow clearance 28. A vacuum conduit 29 is connected to the wall 19 and communicates with the inside of the casing 22 in contradistinction to the conduit 10, 11 of the embodiment shown in FIGS. 1 to 3, which communicates with the inside of the trumpet arrangement. The cavity of the trumpet arrangement according to FIGS. 4 and 5 has an opening 30 communicating with the inside of the casing 22. By suffiiciently enlarging the clearance 28, a relatively strong air current can be produced at 31 where an accumulation of loose fibres may occur because of the provision of the rubber skirt 27.

We claim:

1. A condensing trumpet arrangement for feeding a fibrous strand to a pair of rollers of a spinning machine, said trumpet arrangement including a trumpet portion having a trumpet channel of gradually reduced cross section, a part having a cavity of relatively large cross section adjacent to the smallest cross section of said trumpet channel, a part placed adjacent to said cavity and having a bore substantially coaxial of said trumpet channel, the strand moving consecutively through said trumpet channel, said cavity, and said bore, and suction means operatively connected to said cavity for withdrawing air therefrom.

2. A condensing trumpet arrangement as defined in claim 1 wherein said part having said bore is in the form of an individual interchangeable member.

3. A condensing trumpet arrangement according to claim 1 including an air supply channel connected to said cavity.

4. A condensing trumpet arrangement according to claim 3 wherein said air supply channel has an inlet placed in proximity of the inlet of said trumpet channel.

5. In a spinning machine having a pair of rollers forming a nip, a condensing trumpet arrangement for feeding a fibrous strand to said nip, said trumpet arrangement including a trumpet portion having a trumpet channel of gradually reduced cross section, a part having a cavity of relatively large cross section adjacent to the smallest cross section of said trumpet channel, a part placed adjacent to said cavity and having a bore substantially coaxial of said trumpet channel, the strand moving consecutively through said trumpet channel, said cavity, and said bore into said nip, suction means operatively connected to said cavity for withdrawing air therefrom, and a casing surrounding said trumpet arrangement, the bottom of said casing being closed by said rollers.

6. In a spinning machine as defined in claim 5 wherein the interior of said casing communicates with said cavity.

7. In a spinning machine according to claim 6, and wherein said suction means is connected to said casing for withdrawing air from said casing and said cavity.

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