

Jan. 29, 1963

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3,075,251

TRUMPET CLEANER

Filed Oct. 16, 1959

FIG. 1.

FIG. 2.

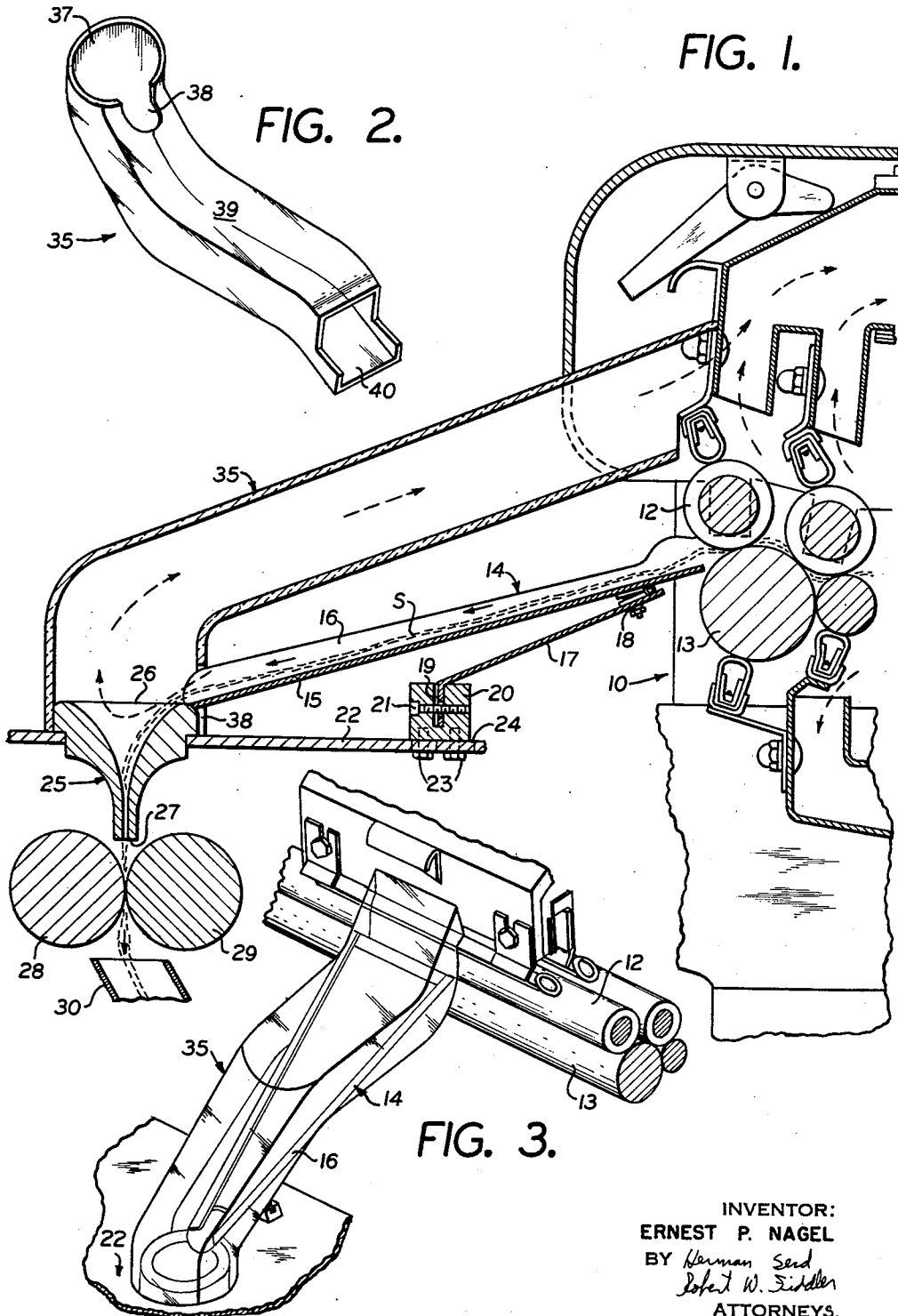


FIG. 3.

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3,075,251

TRUMPET CLEANER

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Filed Oct. 16, 1959, Ser. No. 846,962
3 Claims. (Cl. 19—157)

This invention relates to textile manufacture, more particularly to means for implementing the passage of textile fibers through a trumpet which is normally employed to aid in condensing the fibers during the processing of said fibers into yarn.

Trumpets are utilized at a variety of production stages in the processing of textile fibers into yarn. The trumpet functions to confine the fibers into a relatively constricted path serving to aid in the condensing of the paralleled fibers into the ultimate yarn product. Thus in cotton production, trumpets are utilized at the discharge of the card to condense the carded cotton fibers into sliver. Similarly trumpets are utilized in the various subsequent drafting operations to aid in condensing the sliver or roving. On the draw frame, where trumpets are employed, problems are encountered due to the speed with which the sliver is fed from the drafting rolls to the trumpets. Contemporary textile technology developments have permitted an increase in the speed of feeding of textile fibers through the processing apparatus, with a resulting increase in production. At the presently employed delivery rates, from the drafting rolls of a draw frame, often in excess of 300 feet per minute, the movement of the sliver from the drafting rolls to the trumpet induces an air flow which sets up a turbulence at the trumpet entry. This turbulence produces a backwash at the trumpet entry which establishes a "volcano" of lint thrown up at the trumpet entry. The resultant lint and fly dispersal necessitates constant cleaning of the equipment with an uneconomical increase in cost, and additionally prevents proper visual supervision of the equipment. Other problems arise in that the turbulence at the trumpet entry produces a lack of parallelism in the fibers being processed. Attempts to prevent the loss of fibers thrown up by the aforementioned "volcano" by redirecting these fibers into the processed sliver serves only to increase the lack of parallelism, and decrease the quality of the processed yarn.

It is with these, and other problems in mind that the present means have been evolved, means including both method and apparatus by which the fibers thrown up at the trumpet entry as a result of trumpet backwash are removed for reprocessing without interfering with the rate of flow of the processed fibers through the trumpet, and without interfering with the parallelism or quality of the fibers being processed.

It is accordingly a primary object of this invention to provide means permitting an increase in the rate at which material may be fed through a trumpet.

An additional object of the invention is to provide means eliminating the deleterious effects on the processed material arising from the backwash produced by the feeding of this processed material through a trumpet.

A further object of this invention is to provide means preventing the interference of any material thrown up by the backwash of a trumpet with the quality of the processed material.

A further object of the invention is to provide means preventing a disturbance of the parallelism of the fibers in sliver being fed to the trumpet of a draw frame.

An additional object of the invention is to provide means for preventing the admixture of foreign material with the processed material being fed to a trumpet.

Another object of the invention is to provide means

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facilitating the inspection of sliver during its drafting on a high speed draw frame.

A further object of the invention is to provide means minimizing any required cleaning of a high speed draw frame.

These, and other objects of the invention which will become hereafter apparent are achieved by provision of a duct having one end coextensive with the trumpet entry, and having the other end of the duct extended to a low pressure area remote from the trumpet entry and the sliver fed to the trumpet, whereby an air stream will flow from the trumpet entry to the low pressure area. The resultant air stream which may arise either due to an increase in pressure at the trumpet entry or a suction established at the duct discharge will entrain any material thrown up as a result of trumpet backwash, and deliver this material to the low pressure area which may be a part of an air cleaning system of the Pneumafil type utilized in conjunction with textile machinery, or may be a collection point for the material, whence the material may be redistributed through the processing apparatus.

A primary feature of the invention resides in the fact that the air stream constrained by the duct leading from the trumpet entry to the area of low pressure serves to permit a substantial increase in the rate of speed at which material can be fed to the trumpet since the backwash normally encountered which throws up the material fed to the trumpet in proportion to the rate of speed of such feeding no longer can exert any effect on the material being processed.

Another feature of the invention resides in the fact that the backwash has no effect on parallelism of the fibers of the sliver fed through a draw frame.

A further feature of the invention resides in the fact that the trumpet is continuously cleaned to increase the quality of sliver fed therethrough.

An additional feature of the invention resides in the fact that the fibers normally thrown up by trumpet backwash instead of having to be treated as waste, may be maintained in a relatively clean condition permitting economical reprocessing.

The specific structural details of a preferred embodiment of the invention, and their mode of functioning, will be made most manifest and particularly pointed out in clear, concise, and exact terms in conjunction with the accompanying drawing, wherein:

FIG. 1 is a cross sectional view through the drafting roll stand of a draw frame showing how the inventive concept may be embodied in conjunction with a draw frame having an air cleaning system applied thereto;

FIG. 2 is a perspective view, showing the duct of FIG. 1 inverted to reveal its structural details; and

FIG. 3 is a perspective view of a detail of a draw frame to which the novel duct has been applied.

Referring now more particularly to the drawings, the invention is shown as applied to a high speed draw frame of the Whitin type having a drawing head 10 of the type disclosed in Patent 2,862,249.

Arranged at the discharge of front rolls 12 and 13 of the drawing head 10 is a sliver pan 14 receiving the sliver S as it emerges from the drawing head.

Sliver pan 14 is formed with a plate member 15 having upstanding side walls 16 arranged on each side of the plate. The plate 15, as viewed in FIG. 3, is formed of a tapering configuration, and the side walls 16 are bent inwardly towards each other to cause a convergence of the sliver as it is directed towards trumpet 25. Support for the sliver pan 14 is provided by means of hinge plate 17 secured to the bottom of sliver plate 15 by means of hinge 18. Elbow 19 is formed in hinge plate 17 secured in bearing block 20 by means of set screw 21. Position-

ing of the block with respect to drawing head 10 is accomplished by orienting the block 20 on support plate 22. After proper orientation bolts 23 extending through slot 24 are tightened to secure the sliver pan in operative position.

The sliver pan 14 discharges to the entry 26 of trumpet 25 which as seen in the drawing is a conventional trumpet of infundibular cross section having an entry orifice 26 of considerably larger diameter than the discharge orifice 27 of the trumpet. Conventional calendar rolls 28, 29 are arranged beneath the discharge orifice 27 of the trumpet 25, said rolls feeding the condensed sliver emerging from the trumpet to spout 30 of the coiler head which coils the drawing sliver in a sliver can (not shown).

Means for constraining an air stream in the form of a duct 35 is arranged to extend from the trumpet entry to a low pressure area. At the trumpet entry, the duct is formed with an inlet 37 having a configuration coextensive with that of the external periphery of the trumpet 25 whereby the duct may be securely positioned over the trumpet. A passageway 38 is formed in a bottom wall 39 of the duct 35 as best viewed in FIG. 2 to permit the sliver pan 14 to pass therethrough to the trumpet entry 26. At the end of the duct remote from inlet 37, outlet 40 is provided for coupling to a low pressure source. In the illustrated embodiment of the invention, the duct 35 is joined to a low pressure source established by a suction cleaning system of the Pneumafil type which is applied to the drawing head 10 of the draw frame. It will be apparent to those skilled in the art that connection to the suction system as shown results in the establishment of an air stream in duct 25 moving in the direction of the arrows.

The duct 35 is preferably fashioned of a transparent plastic material permitting visual observation of the proper function thereof, so that as viewed in FIG. 3 the structural components of the sliver pan 14 are shown as viewed through the duct 35. The particular shape of the duct is such as to permit most efficient flow of the entrained material therethrough. Here where connection is made to the collecting header of a suction cleaning system the outlet 40 has been shaped to permit ready connection to a simply provided opening in the header. This connection may be made with or without bypass.

Operation

The aforescribed structure may be utilized to implement an increase in the rate of passage of the sliver S through the trumpet 25 of the draw frame.

This is accomplished by establishing a flow of air in the direction of the arrows through duct 35 whereby any fibers thrown up as a result of the passage of the sliver into the trumpet 25 are entrained in the air stream passing through duct 35 and fed to the low pressure source which in the illustrated embodiment forms part of the draw frame air cleaning system whence the thrown up fibers are drawn to a collection point for reprocessing.

It will be observed that the air stream established in duct 35 serves the threefold function of: collecting the fibers thrown up by the backwash of the trumpet entry; preventing return of these fibers to the sliver to interfere with the parallelism of the sliver fibers; and cleaning the trumpet entry 26 to expedite sliver flow therethrough, and improve the quality of the yarn produced from the sliver.

Though it is desirable to connect the outlet end of the duct to a suction cleaning system as described, it has been found that the pressure built up at the trumpet entry is such as to provide air flow through duct 35 without connecting to a positive suction source, so that the duct may merely be extended to a suitable collection point.

It is thus seen that improved means have been provided for use in conjunction with the condensing trumpets conventionally employed in textile manufacture. The novel means implement the passage of textile fibers through the trumpet by continuously cleaning the trumpet entry and diverting any excess fibers fed to the trumpet, which normally are thrown up, back to a collection point permitting re-use of these fibers. The novel means permits an increase in the rate of flow of the fibers to the trumpet thus increasing the production rate of the apparatus; improves the quality of yarn formed since parallelism of the fibers is not interfered with; and serves further to minimize maintenance requirements by providing for substantially automatic cleaning of the area about the trumpet. Additional benefits accrue since the cloud of lint fly and the like fibers normally encountered in the vicinity of the trumpet of a high speed textile operation are eliminated and the clear plastic duct permits visual supervision of the operation.

The above disclosure has been given by way of illustration and elucidation, and not by way of limitation, and it is desired to protect all embodiments of the herein disclosed inventive concept within the scope of the appended claims.

What is claimed is:

1. In a high speed draw frame in which sliver is fed from the drafting rolls to a condensing trumpet, apparatus implementing the flow of sliver to the trumpet, said apparatus comprising: a sliver pan adjustably mounted between the front drafting rolls and the trumpet; adjustable supporting means for said pan; a duct having an inlet coextensive with the periphery of the trumpet, said duct having a passageway adjacent said inlet through which the sliver pan may extend to the duct, and an outlet on said duct remote from said inlet through which any fibers collected in an air stream constrained within said duct may be discharged.

2. Apparatus as in claim 1 in which said duct is formed with a progressively decreasing cross section.

3. Apparatus as in claim 2 in which side walls are arranged along the upstanding edge of said pan to aid in confining the sliver in its flow along said pan, and the portions of the side walls passing through the passageway into said duct are curved inwardly to further confine the sliver path.

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