March 3, 1959 M. S. ROBINSON 2,875,727

DEVICE FOR COATING MULTIPLE STRAND YARNS

Filed Dec. 17, 1956

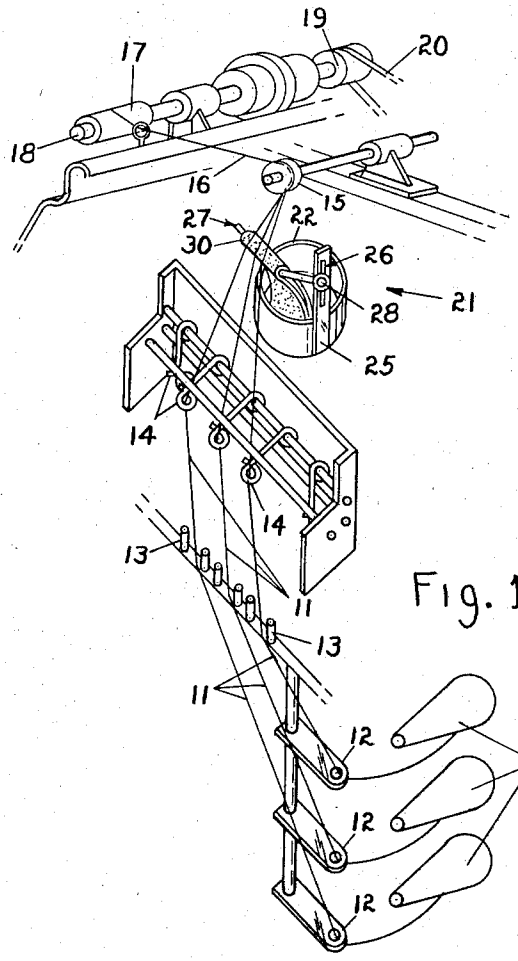


Fig. 1

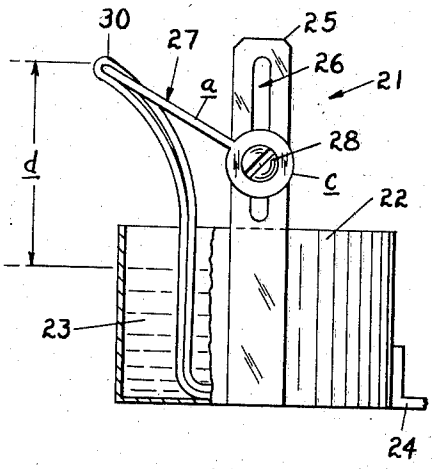


Fig. 2

Fig. 3

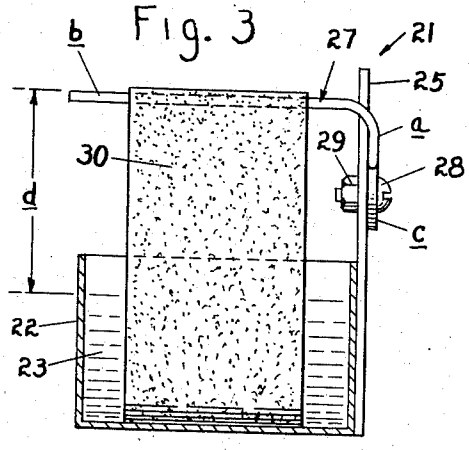
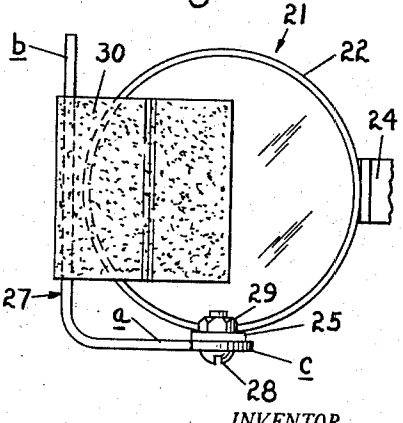


Fig. 4



INVENTOR.
Miles S. Robinson
BY
Robbe & Swope
ATTORNEYS

United States Patent Office 2,875,727 Patented Mar. 3, 1959

2,875,727

DEVICE FOR COATING MULTIPLE STRAND YARNS

Miles S. Robinson, Maumee, Ohio, assignor to L-O-F Glass Fibers Company, Toledo, Ohio, a corporation of Ohio

Application December 17, 1956, Serial No. 628,846

2 Claims. (Cl. 118—268)

This invention relates broadly to the forming of continuous strands from materials which are capable of being drawn into fibers, such as for example glass, and more particularly to an improved device for applying a coating material to the strands prior to being gathered into a multiple strand yarn.

A conventional method of producing multiple strand yarns is to apply a lubricant and/or sizing material to a plurality of glass fiber strands and then gather them together by drawing the strands through a groove in a guide wheel or stationary pad at a very high rate of speed. The multiple strand yarn thus formed is then wound into a package on a rapidly rotating spool.

As stated above, prior to the formation of the yarn it is customary to apply a lubricant and/or a sizing material to the strands for binding them together. The application of a lubricant is especially important where the strands are formed of glass fibers since the lubricant reduces the inter-abrasive forces of the strands during the formation of the yarn. This frictional or abrasive force between the strands is substantial, since in the formation of the yarn the rotating spools on which the yarn is wound pull the strands at a very high velocity, i. e. in the neighborhood of 2,000 to 5,000 feet per minute. A sizing material is applied to the strands not only to bind them together, but also because of some special quality that it is desired to impart to the finished strands. For example, some binding materials are used because they possess electrical insulative properties, whereas other materials are used because of their moisture resistant quality.

It is customary for the application of the sizing material to be effected by rollers driven by small electric motors. These rollers receive the sizing liquid from a trough or other suitable receptacle and apply it to the strands as they are drawn over the rollers. In general, the greater the speed of the roller the more liquid is applied to the strands. This method of application not only involves a high initial expense for rollers, electric motors and the drive mechanism, but there are also maintenance costs for replacement and repair of the motors and rollers. Additionally, in the application of a coating liquid by a rotating roller there is a tendency for the roller to throw or spatter the liquid beyond the strands and into the surrounding work area, which is obviously an undesirable condition.

Therefore, it is an important object of the present invention to provide a novel device for the coating of strands which requires relatively less maintenance than coating devices heretofore employed.

Another object of the invention is the provision of such a device including a wiping member which, by a simple positioning adjustment, can be made effective to apply different amounts of the coating liquid to the strands.

Other objects and advantages of the invention will become more apparent during the course of the following description when taken in connection with the accompanying drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Fig. 1 is a perspective view of a strand coating device according to the present invention, shown in operative position for coating strands which are being formed into a multiple strand yarn;

Fig. 2 is a side view of the strand coating device, partially in section;

Fig. 3 is a front elevation of the strand coating device; and

Fig. 4 is a plan view of the strand coating device.

Although the invention is illustrated and will be described in connection with the coating of strands made from glass fibers with a lubricant and/or sizing material it is to be understood that the invention may also be used for coating strands made from various types of fibers, for example, rayon or cellulose acetate.

Referring now to the drawings and particularly to Fig. 1, there is illustrated a plurality of strand packages **10** of glass fibers. The continuous strands **11** are drawn from the packages **10** through openings in guide bars **12**, between spaced positioning pins **13**, through knockoff guides **14**, and then gathered together by a grooved guide wheel **15** to form a multiple strand yarn **16** which is wound on a spool **17** into a package. The spool **17** is carried by a rapidly rotating shaft **18** provided with rotative motion by pulley **19** which is driven by drive belt **20** through the action of a motor (not shown).

Positioned at a point between the knockoff guides **14** and the guide wheel **15** is the improved coating device of this invention, indicated generally by the numeral **21**. This device, which applies a coating to the strands **11**, includes a receptacle **22** for the coating material which preferably is in the form of a liquid **23**. The receptacle **22** is secured to a suitable supporting means by bracket **24**.

Secured to the wall of the receptacle is an upwardly extending support member **25** and spaced slightly inwardly from the upper extremity thereof is a vertical slot **26**. Carried by the support member **25** is a support arm **27** comprising a forwardly and upwardly extending portion *a* terminating at its upper end in a horizontal portion *b*, the portion *a* being provided with a head *c* secured to support member **25** by a bolt **28** inserted through slot **26** and having threaded thereon a nut **29**.

A wiping member **30** preferably in the form of a strip-like pad of absorbent material, is slipped over the horizontal portion *b* of the support arm **27**. The wiping member is arranged with its lower end being received in the coating liquid while its upper part is in contact with the strands. The pad may be of felt or any other suitable material which is capable of absorbing the coating liquid **23**.

As shown in Fig. 2 the support arm **27** holds a portion of the pad upwardly and outwardly away from the receptacle **22** while another portion of the pad is immersed in the coating liquid **23**. Thus, with one part of the pad resting in the liquid **23**, the pad will remain saturated because of capillary action bringing the liquid to all parts of the pad. The amount of liquid which is applied to the strands in this way, using a particular pad, is dependent on the viscous nature of the coating liquid and the height of the wiping portion of the pad above the surface of the liquid, which height is designated by the distance *d*. That is, the greater the distance *d* the less fluid will be applied to the strands with a given liquid. Also by maintaining the distance *d* constant the more viscous a liquid is and the less material will be applied to the strands.

In operation, when it is desired to increase or decrease the ampunt of coating liquid applied to the strands, this can be accomplished by loosening nut **29**, raising or lowering the support arm as described hereinabove, and then retightening the nut. The simplicity of this pad positioning adjustment allows its accomplishment to be left to relatively unskilled personnel.

A special feature of the invention is that when the pad **30** becomes completely worn, and it is necessary to replace it with a new one, this change may be accomplished very quickly by simply lifting the old pad off the supporting arm **27** and placing a new one thereon, the complete change involving a matter of seconds. This is a decided advantage over the prior use of roller applicators since when a roller became too worn for further use it was necessary to shut down the yarn production while the roller was being replaced, which down-time is considerably longer than that required to replace a pad of the present invention.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred embodiment of the same, but that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A device for applying a coating material to moving strands, comprising a receptacle for the coating material, a support member carried by the receptacle and extending upwardly therefrom, a support arm carried by said support member and having a substantially horizontal portion, a wiping member in the form of a relatively wide pad of absorbent material removably carried by the horizontal portion of said support arm and having a portion thereof received in the coating liquid, means for mounting the receptacle to position the wiping member in the path of the moving strands, and means for securing said support arm to said support member for vertical adjustment relative thereto to raise or lower the horizontal portion of said support arm and the strand contacting portion of the wiping member relative to the coating material in said receptacle.

2. A device for applying a coating material to moving strands, comprising a receptacle for the coating material, a support member carried by the receptacle and extending upwardly therefrom having a vertical slot therein, a support carried by said support member and having a forwardly and upwardly extending portion the extremity of which is a substantially horizontal portion, a wiping member in the form of a relatively wide pad of absorpent material removably carried by said support arm and having a portion thereof received in the coating liquid, means for mounting the receptacle to position the wiping member in the path of the moving strands, and means carried by said support arm and received in the vertical slot in said support member for securing said support arm to the support member for vertical adjustment relative thereto to raise or lower the horizontal portion of said support arm and the strand contacting portion of said wiping member relative to the coating material in said receptacle.

References Cited in the file of this patent

UNITED STATES PATENTS

1,769,250	Arvidson	July 1, 1930
2,022,854	Greenwood	Dec. 3, 1935
2,120,110	Morrell	June 7, 1938
2,201,803	Todd	May 21, 1940

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,875,727 March 3, 1959

Miles S. Robinson

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 71, after "liquid is" strike out "and"; column 4, line 13, after "support", first occurrence, insert — arm —.

Signed and sealed this 28th day of July 1959.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents