June 17, 1958 J. SUTTER 2,838,903

RING SPINNING MACHINES

Filed Feb. 9, 1956

Fig. 1.

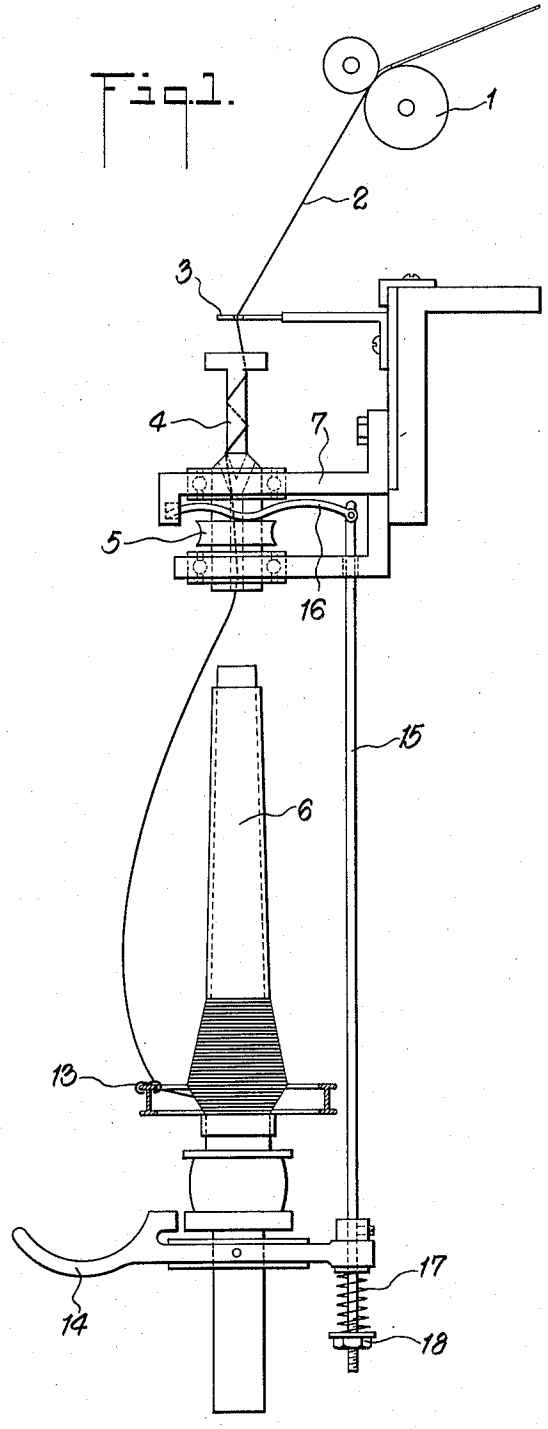


Fig. 2.

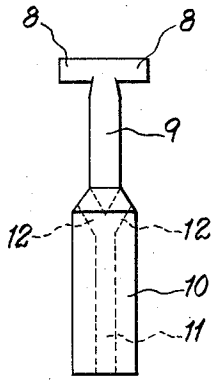
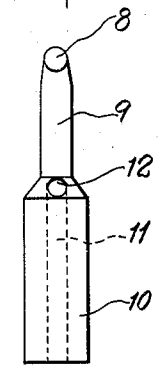


Fig. 3.



INVENTOR:
Joseph Sutter
BY
Robert Henderson
ATTORNEY

United States Patent Office 2,838,903
Patented June 17, 1958

2,838,903

RING SPINNING MACHINES

Joseph Sutter, Raddon, France

Application February 9, 1956, Serial No. 564,533
Claims priority, application Germany April 22, 1955
4 Claims. (Cl. 57—51)

This invention relates to machines for spinning yarn and is directed, more particularly, to the provision of an improved spinning machine which includes means for twisting the yarn before it is wound.

In ring spinning machines, yarn breakages mostly occur at that portion of yarn which is adjacent to the drawing rollers. The reason for this is that the twist given to the thread at the spindle does not travel upwardly to reach the said portion of yarn fast enough. Hence, this upper portion of yarn is only weakly twisted and has insufficient strength to withstand the tension to which it is subjected.

It is known to provide a supplementary element between the runner or traveller and the drawing rollers in order to improve the upward travel of the twist on the yarn. Such known aids, however, solve the problem only incompletely.

According to the invention, a twisting element is provided between drawing rollers and a traveller, which element gives the yarn all its twist and right up to the drawing rollers.

This feature has considerable advantages. Twisting now takes place completely at the above-mentioned upper portion of the yarn so that yarn breakages are almost entirely eliminated, because the yarn is sufficiently strengthened closely behind the drawing rollers.

The twisting element is preferably a rotating spindle member having two upper arms and around which the yarn is wound at least once, but preferably one and one half times or even twice. The arms of this spindle member carry the yarn with them so that when the spindle member rotates at a speed which suits the main spindle, the entire twisting takes place in the upper yarn portion. Winding of the yarn around the spindle member has the further advantage that the tension on the lower yarn portion is not transmitted to the upper portion of yarn. Thus, twisting in the upper portion of yarn takes place without substantial tightening and consequently the elasticity of the yarn is retained as much as possible. In view of these conditions it has been shown possible to rotate the traveller faster than in hitherto known ring spinning machines. Speeds from 14,000 to 15,000 revolutions per minute may be used.

According to a further feature of the invention, the spindle member has a hollow lower portion to allow the yarn to run off axially, the bore so formed being extended upwardly and outwardly by one or two inclined channels.

An example of the invention is shown in the drawing in which:

Figure 1 is a side elevation of the important parts of a ring spinning machine;

Figure 2 is a front elevation of the spindle member;

Figure 3 is a side view of the member of Figure 2.

Referring to the drawings, yarn **2** issues through drawing rollers **1** and runs through a yarn guide **3** to a twisting element **4** which is driven by a pulley **5** from

a drum (not shown). The twisting element **4** is driven at a speed slightly higher than the main spindle **6**, and is illustrated in the form of a spindle member.

The spindle member **4** is mounted on a bed **7** of the machine frame, and, as shown in Figs. 2 and 3, comprises three main parts. At the top two short arms **8** are arranged substantially perpendicular to a shaft portion **9**. A lower portion **10** is formed with a larger diameter than the shaft portion **9** and a bore **11** which branches upwardly and outwardly in two inclined channels **12**.

The yarn coming from the guide **3** is wound around the shaft portion **9** at least once. It is preferred that it be wound one and one half times as shown in Fig. 1. The yarn then runs from the shaft portion **9** through one of the channels **12** into the bore **11** and thus leaves the spindle member downwardly and axially.

As is usual, the yarn then extends to the runner or traveller **13** and is wound onto the main spindle **6**.

The pulley **5** is mounted on the lower part of the spindle member between two rails of the bed **7**. A mutual braking arrangement may be provided to stop both the spindle member **4** and the main spindle **6**. A brake **14** for the main spindle is connected to a friction disc **16** for the twisting element by a rod **15**, the friction disc acting on the pulley **5**. Correct adjustment of the mutual braking arrangement can be effected by a nut **18**, which communicates with a compression spring **17**.

The yarn is threaded by inserting a threading hook into one of the channels **12**, the hook part of which is adapted to protrude from the bore **11**. The yarn from the cop is threaded through the traveller and then pulled upwardly through the bore **11** by the threading hook, wound as desired once to twice around the shaft portion **9**, threaded upwardly through the thread guide **3** and then knotted.

By means of the twisting element **4**, which is adapted to rotate somewhat faster than the main spindle, the yarn is completely twisted at its upper portion so that the main spindle merely has to wind the yarn. The portion of thread extending upwardly from the arms **8** to the drawing rollers **1** is thereby effectively twisted and becomes so strong that yarn breakages at that portion are substantially eliminated. By means of the winding on the shaft portion **9** of the spindle member **4**, the tension that exists is retained upwardly thereof. Thus, the tension in the upper yarn portion is small and the elasticity of the yarn is largely retained. Since the traveller **13** can rotate faster, the performance of the machine is improved so that the expense of fitting the spindle member is more than compensated. In addition, it has been found that an arrangement according to the invention produces harder cops. The weight of the cop is thus greater than that of cops having the same annular diameter and wound on other machines.

What I claim is:

1. In a spinning machine, yarn twisting means disposed between yarn drawing means and a traveller for twisting yarn passing between said yarn drawing means and the traveller, said yarn twisting means comprising a rotary twisting element adapted to engage such passing yarn and substantially twist it during its passage between said yarn drawing means and said element, said element having a shaft portion adapted for the reception spirally therearound of at least one turn of the passing yarn, and having a laterally extending arm, at the end of the shaft portion operatively nearest to said drawing means, for entraining the yarn as the twisting element rotates.

2. Yarn twisting means according to claim 1, said twisting element having a plurality of such arms and having guiding means at the end of the shaft portion

operatively nearest to said traveller for terminating such spiral disposition of the yarn at a non-variable circumferential point.

3. Yarn twisting means according to claim 1, said twisting element having an enlarged portion, at its end which is distal from said arm, of greater diameter than said shaft portion, said enlarged portion being formed with a central, axial bore and an inclined transverse channel communicating with said bore and opening at the exterior of the twisting element at the junction of said shaft portion and said enlarged portion.

4. A twisting element for a spinning machine, comprising a shaft formed with a yarn guiding passage therein, one end of which opens centrally at one end of the shaft and the other end of which opens at the shaft's side wall, and a pair of oppositely and laterally extending arms at the other end of the shaft; the shaft having a cylindrical surface, intermediate said pair of arms and said side-wall opening of said passage, adapted to receive yarn spirally therearound.

References Cited in the file of this patent

UNITED STATES PATENTS

777,696	Rhodes	Dec. 20, 1904
1,771,656	Roe	July 29, 1930
1,899,730	Schweizer	Feb. 28, 1933

FOREIGN PATENTS

277,673	Great Britain	Jan. 19, 1928
858,654	Germany	Dec. 8, 1952