

Dec. 29, 1931.

M. INGHAM

1,838,682

CAP FRAME

Filed July 3, 1931

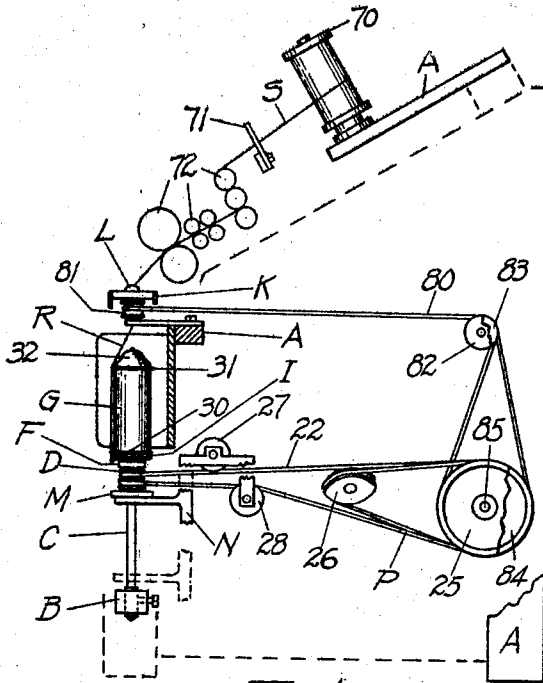


Fig. 1.

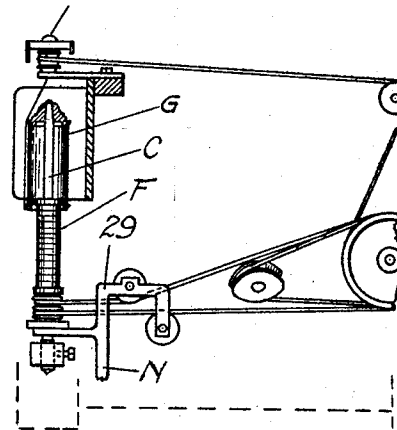


Fig. 2.

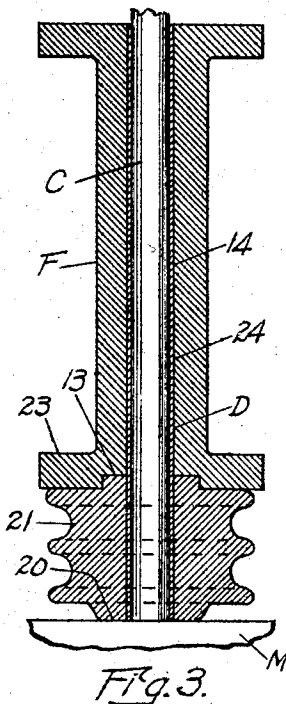


Fig. 3.

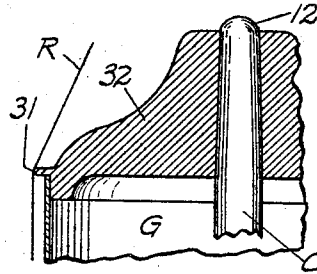


Fig. 4.

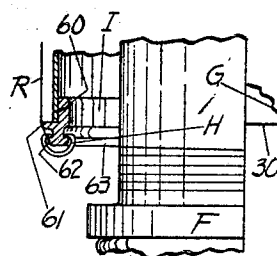


Fig. 5.

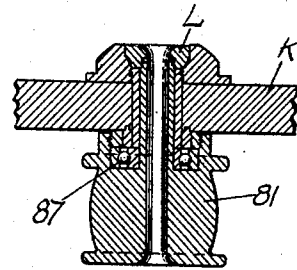


Fig. 6.

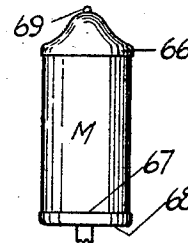


Fig. 7.

INVENTOR
Mark Ingham
BY
Gardner D. Pearson
ATTORNEY

UNITED STATES PATENT OFFICE

MARK INGHAM, OF LOWELL, MASSACHUSETTS

CAP FRAME

Application filed July 3, 1931. Serial No. 548,511.

This invention relates to the formation of textile strands particularly what is known as roving and also to spun and twisted yarn. It is peculiarly applicable to the treatment of wool fibres in forming worsted yarn.

In worsted processes, the untwisted sliver is somewhat twisted in the process of forming slubbing and roving and the strand or strands are then drawn and spun after which usually two or more strands of spun yarn are twisted to form twisted yarn.

In twisting roving, what is known as a flyer having an arm has been used and also cap frames and ring frames.

In the ring frame, a revolving spindle carrying a bobbin is used in connection with a ring carried by a rail, such ring being provided with a traveller through which the roving or slubbing from the feed rolls travels. The ring rail with its ring and traveller traverses or moves up and down to wind and build the yarn on the bobbin.

In the cap frame, there is a fixed spindle which carries a cap at the top and there is a bobbin tube and whirl carrying a bobbin which revolves and also moves up and down on the spindle, the yarn being wound and built on the bobbin from the lower edge of the cap. The size of the bobbin is limited by the vertical distance it can travel to bring each part in line with the lower rim of the cap and such caps are frequently made tapering from the top towards the bottom so that as the roving balloons, it will fly clear of the outside surface of the cap which is not always smooth and might catch it causing breaks.

This invention might be described as a combination of cap and ring. By using a special type of cap and also something in the nature of a traveller, I can use a cap which is substantially longer and of substantially greater diameter and can also increase the speeds.

I can, therefore, on the same frame increase the size of the bobbin or spool as for instance from seven inches to nine inches in length and from three and a half inches to four and a half inches in diameter.

Where used for roving on a roving frame, as the sliver or slubbing when it is delivered by the delivery rolls is not twisted and, there-

fore, weak, I prefer to carry it through a revolving guide eye or trumpet which puts into it a false twist thus adding to its strength. Such a false twist is not necessary when my device is used on a spinning or twisting frame, although with tender stock, it may be used to advantage on a spinning frame.

On my device, I can increase the speed of delivery one hundred per cent and can increase the revolutions per minute of the bobbin from around fifteen hundred to four thousand while the yarn package can be increased as from twelve ounces to sixteen ounces.

The resulting product is stronger and the twist is more even for the following reason. While the distance from the barrel of the bobbin or spool to the lower rim of the cap increases as the yarn package is built, from the lower rim of the cap to the guide eye, the distance is constant with nothing to interrupt the even twist.

In a general way, my device consists of using a fixed spindle rail with fixed guide spindles extending upward therefrom and using on each spindle a spool carrier which carries a spool or bobbin and has means to revolve it and also move it up and down on a spindle, combined with a cap of large size which instead of being conical is substantially cylindrical except where it narrows in at the top, such cap being provided near the top of the cylindrical part with an outwardly projecting top strand guide ring of smooth hardened metal and at its lower rim with a downwardly and outwardly projecting hardened strand guide ring so formed that a traveller can move around depending from the last named guide ring. These may be associated with a revoluble guide eye carried by a rail positioned between the delivery rolls and the top of the spindle.

My device is particularly useful when the frame is started or is stopping as the strand of fibre slips around the two strand guide rings or bands with very little friction until it starts to balloon.

Fig. 1 is a diagrammatic side elevation of what might be a roving frame, a spinning frame or a twisting frame showing the rela

tion of the various parts which affect my device, the bobbin being shown in its highest position in the cap.

Fig. 2 is a view similar to Fig. 1 on the same parts and showing the bobbin in its lowest position with reference to the cap, the cap being shown in section.

Fig. 3 is a vertical sectional view of the spindle, spool carrier and spool.

Fig. 4 is a vertical sectional view of the top part of a cap.

Fig. 5 is a vertical sectional view showing part of the bottom of a cap with a spool in place.

Fig. 6 is a vertical sectional view of the revoluble guide eye.

Fig. 7 is an elevation of a modified form of cap.

In the drawings, A represents the frame of a worsted cap machine which might be a roving frame or a spinning frame. B is a fixed spindle rail and C a guide spindle fixed thereto and projecting upwardly therefrom.

D is a spool carrier which includes a base 20 which rests on a bobbin rail M, a whirl 21 driven by a band such as 22, the shoulder 23 which enters a recess 13 in spool F and a tube 24 which fits smoothly inside the central hole 14 of spool F.

N represents means to move bobbin rail M up and down. It may be connected to and operated by any of the well known builder motions such as the Scaife motion or any heart cam actuated builder means.

P represents the means to revolve the spool carrier and as shown includes a well known arrangement of pulleys such as 25 and 26 around which travels a continuous band such as 22.

I also prefer to provide the two guide pulleys 27 and 28 carried by a frame 29 connected with the builder means N of the bobbin rail M whereby the band 22 is kept in horizontal alinement with the whirl 21 during the building. This last arrangement is desirable as I use a considerably longer spool or bobbin than is customary. Preferably pulleys 27 and 28 are revoluble in ball bearings.

G is a cap which is cylindrical from the bottom edge 30 to the top guide ring 31 which projects outwardly and is made of smooth hardened metal so that the roving R will slide around on its outer rim smoothly and with the least amount of friction. The top of cap G is constricted at 32 and is forced upon the top 12 of spindle C.

I is a hardened metal ring which as shown has a part 60 which fits just inside the lower rim 30 of cap G and at 61 projects out beyond lower rim 30 while below are the flanges 62 and 63 which serve as a track for a traveller or brake H. This traveller H depends below ring I and as the roving R, as shown in Figs. 4 and 5, when the machine starts, runs down over ring 31 then over the outer edge 61

of ring I and thence under and between the flanges 62 and 63, as it moves around, it carries traveller H with it.

The roving R does not run through traveller H but pushes it along at a speed which can be regulated by increasing or decreasing the weight of the traveller.

The sliver or slubbing S has been wound on spools such as 70 and runs from there through a suitable traversing guide 71 and through drawing rolls 72 all of any usual type thence through a guide eye L in guide eye rail K.

This guide eye L may be stationary or may be allowed to remain stationary or may be revoluble as by means of an endless band 80 which travels around a whirl 81, around guide pulleys such as 82 and 83 and thence around another pulley 84 carried by the same shaft 85 which carries the pulleys 25. As shown, the revoluble guide eye L may run in ball bearings such as 87.

While I prefer to use a top strand guide ring such as 31 made of hardened metal and projecting, and at the bottom a downwardly and outwardly projecting hardened strand guide ring such as I with flanges which serve as a raceway for a traveller such as H, I can, as shown in Fig. 7, use a cap M, carried by a spindle 69, which is of substantially cylindrical form and which at the top 66 has an annular band which is smoothly polished and at the outside lower edge a smoothly polished band 67 which merges into another smoothly polished band 68 around the bottom rim.

The top band 66 preferably extends partly over the rounded part at the top of the cap and while it is desirable that the top and bottom strand guiding bands should project slightly, they are a distinct advantage even if they do not project.

I claim:

1. The combination in a worsted roving machine, of a frame, a fixed spindle rail, a guide spindle fixed thereto, a spool carrier slidable on said spindle, means to revolve said spool carrier and means to move it up and down on the spindle; with a cap carried at its top at the top of the spindle, said cap having near its upper part a hardened outwardly projecting top strand guiding ring and at its bottom, a downwardly and outwardly projecting hardened strand guiding ring; a traveller slidable on, around and below said last named ring; strand delivery rolls; a guide eye rail between the delivery rolls and the top of the spindle; and a revoluble guide eye in said rail; together with means to revolve said guide eye.

2. The combination in a worsted roving machine, of a frame, a fixed spindle rail, a guide spindle fixed thereto, a spool carrier slidable on said spindle, means to revolve said spool carrier and means to move it up and down on the spindle; with a cap carried

at its top at the top of the spindle, said cap having near its upper part a hardened outwardly projecting top strand guiding ring and at its bottom, a downwardly and outwardly projecting hardened strand guiding ring; a traveller slidable on, around and below said last named ring; strand delivery rolls; a guide eye rail between the delivery rolls and the top of the spindle; and a guide eye in said rail.

3. The combination in a worsted roving machine, of a frame, a fixed spindle rail, a guide spindle fixed thereto, a spool carrier slidable on said spindle, means to revolve said spool carrier and means to move it up and down on the spindle; with a cap carried at its top at the top of the spindle, said cap having near its upper part a hardened outwardly projecting top strand guiding ring and at its bottom, a downwardly and outwardly projecting hardened strand guiding ring; strand delivery rolls; a guide eye rail between the delivery rolls and the top of the spindle; and a guide eye in said rail.

4. The combination in a textile strand twisting machine, of a frame, a fixed spindle rail, a guide spindle fixed thereto, a spool carrier slidable on said spindle, means to revolve said spool carrier and means to move it up and down on the spindle; with a cap carried at its top at the top of the spindle, said cap having near its upper part a hardened outwardly projecting top strand guiding ring and at its bottom, a downwardly and outwardly projecting hardened strand guiding ring; strand delivery rolls; a guide eye rail between the delivery rolls and the top of the spindle; and a guide eye in said rail.

5. The combination in a textile strand twisting machine, of a frame, a fixed spindle rail, a guide spindle fixed thereto, a spool carrier slidable on said spindle, means to revolve said spool carrier and means to move it up and down on the spindle; with a cap carried at its top at the top of the spindle, said cap having near its upper outside part a smoothly polished top strand guiding band and at its bottom on its outside and bottom edges smoothly polished bands which merge together; strand delivery rolls; a guide eye rail between the delivery rolls and the top of the spindle; and a guide eye in said rail.

In testimony whereof I affix my signature.
MARK INGHAM.