

June 12, 1962

M. PÁVEK
SPINNING BASKET

3,038,293

Filed April 19, 1960

2 Sheets-Sheet 1

FIG. 2

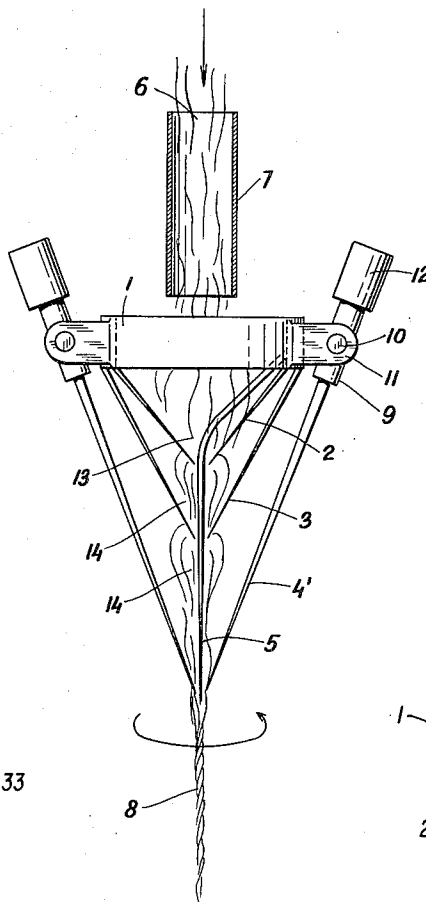


FIG. 1

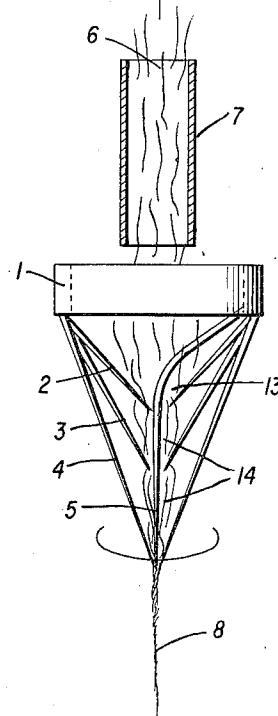
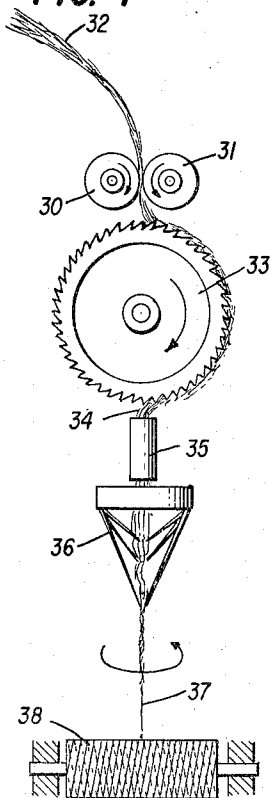


FIG. 4



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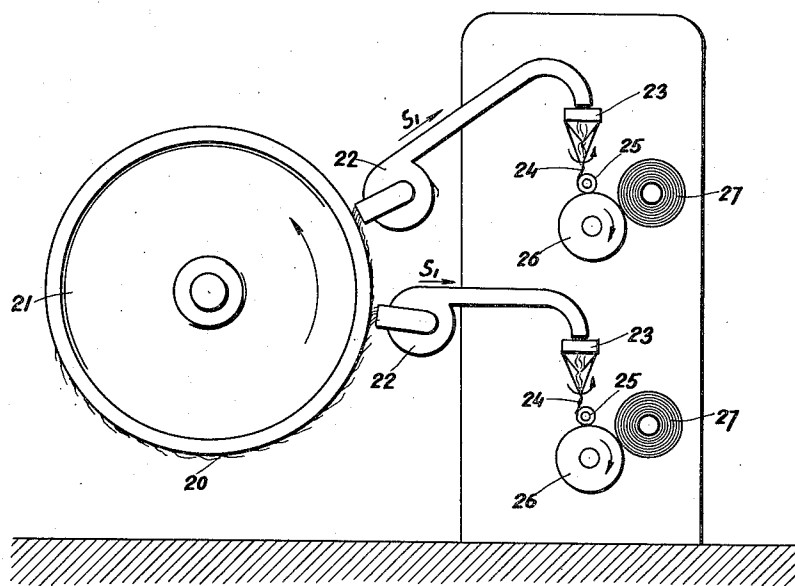
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FIG. 3



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1

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SPINNING BASKET

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8 Claims. (Cl. 57—58.93)

The present invention relates to a device for the continuous production of yarn directly from loose fibres and deals more particularly with a multi-stage spinning basket for use with a device for the continuous production of yarn or roving.

Methods and devices for producing yarn directly from loose fibres are known, the loose fibres being supplied to a spinning basket from a card or similar machine by means of a stream of air, water or any other suitable medium. The spinning basket, revolving at a high speed, comprises a needle system, the needles being fixed to the periphery of a ring and converging conically towards a central point.

During their passage through the spinning basket the loose fibres strike against the various needles and are pulled along the needles to said conical central portion, where they are compacted, and due to the rotation of the spinning basket twisted to yarn or roving. After the required twist has been imparted to the yarn or roving in the spinning basket, the yarn or roving is wound in the usual way on bobbins of any desired shape.

The machines of the described type show certain disadvantages because for a satisfactory operation a considerable twist and therefore a high speed of rotation is necessary, apart from the fact that the yarn does not possess the required quality considering that in a spinning basket of this type the loose fibres are not brought in parallel position to a sufficient degree.

In order to improve the parallel positioning of fibres in such a spinning basket, a tube is accommodated therein, the cross sectional area of which is smaller than that of the supply ring or supply pipe and the length of which exceeds half the maximum length of the treated fibres. The fibres supplied in a loose state into the basket strike against the upper edge of the tube, are bent over the same and are thus placed in parallel relationship. The fibres which are straightened in their entire length proceed to the conical tip of the spinning basket, with the result that a yarn of better quality and higher strength is obtained. The adjustment of the tube in the rapidly rotating ring is, however, rather difficult, as it requires a relatively intricate design of the adjusting device, and moreover, does not fully answer the required purpose.

It is an object of the present invention to provide a spinning basket in which the placing of the fibres in parallel relationship is considerably improved.

A further object of the invention is to provide a spinning basket in which yarn or roving of satisfactory quality is obtained at relatively low rotation speeds of the spinning basket.

Further objects and advantages of the present invention will appear from the ensuing disclosure thereof.

According to the invention the spinning basket comprises a series of systems of conically converging needles, a guiding needle extending through the tips or apices of the cones. Said needle cones are inclined under different angles, the height of the tips being therefore also different. Some needles, in particular those forming the outer cone, have preferably the shape of two-arm levers which are pivoted on a fixed pin. The lever arms carrying the needles are pressed by the centrifugal force of weights, provided on the other lever arm, against the tip of the cone i.e. against the guiding needle.

2

The invention will now be described with the accompanying drawings which illustrate several exemplary embodiments thereof.

FIGURE 1 shows one example of the multi-stage spinning basket in a diagrammatic elevational view,

FIGURE 2 is a similar representation of another example of the multi-stage spinning basket,

FIGURE 3 shows diagrammatically the overall arrangement of a spinning machine wherein use is made of either of the above two spinning baskets for the manufacture of yarn or roving directly from a carding machine and

FIGURE 4 shows an exemplary embodiment of the invention wherein either of the above spinning baskets is used as a rotary compacting member in a drawing frame used for the spinning of carded yarn or similar material.

The multi-stage spinning basket comprises a rotary ring 1 provided at its periphery with several needle systems, such as the systems 2, 3, 4, the needles of each system converging conically towards a guiding needle 5 passing through the tips or apices of the systems. Each of said needle systems has a different length and inclination. The loose fibres of the material which has to be spun are supplied to the system by means of a stream of air, water or another suitable medium through a supply pipe 7 as shown in FIG. 1. The described apparatus serves for producing a yarn or roving.

FIG. 2 shows a modified embodiment of the multi-stage spinning basket. Secured to the periphery of a ring 1 are needle systems 2 and 3, and an outer needle system 4' is provided, comprising needles which are secured in two-arm holders 9 carrying weights, comprising said holders being pivotally mounted on pins 10 arranged in lugs 11 of the ring 1. Similarly to the previous example the guiding needle 5 extends through the apices of the needle systems 2, 3, 4'. On rotation of the spinning basket the needles 4', fixed in the two-arm holders 9, are pressed by the centrifugal force exerted by the weights 12 against the apex of the cone, i.e. against the guiding needle 5.

It will be appreciated that further systems of conically converging needles can be arranged in the ring 1 in a similar way, without departing from the scope of the present invention, at least two such systems, however, being employed in the spinning basket.

The multi-stage spinning basket according to the invention operates as follows:

Fibres 6 of the material which has to be spun and which have been suitably separated in any desired known manner, are supplied to the spinning basket through the supply pipe 7 by means of a stream of air, water or another suitable medium. The stream of air or liquid, having passed through the ring 1, flows through the spinning basket between the conically converging needles of the spinning basket, while the entrained fibres 6 are retained by and on the needles, in particular on their converging ends. A portion of the fibres 6 is retained by the first conical needle system 2, where they form the initial fibre core 13, some of their ends penetrating as far as the conical needle system 4, where they are retained and drawn so as to form the initial yarn 8.

Between the top needle systems 2, 3 and the lower needle systems 3, 4 a fibre balloon 14 is formed, the lower part of which is caught beyond the needle system 4 or 4' and drawn so as to form the yarn or roving. The guiding needle 5 extends through the centre of the spinning basket, and the fibres 6 are partially wound around the guiding needle, which is the essential factor in achieving the correct parallel position of the fibres. Fibres, the parallel positioning of which has not been fully effected in the upper systems, are successively placed in parallel relationship in the further needle systems 3 and 4 or 4',

prior to leaving the spinning basket in the form of yarn or roving 8.

The device according to the invention can be used with advantage for the production of yarn or roving directly from the card, as shown diagrammatically in FIG. 3. The fibres 20 of the material to be treated are taken off the surface of a known carding roller 21 by means of an air suction device 22, shown diagrammatically only, said device conveying the fibres in the direction of the arrow S_1 into a spinning basket or spinning baskets 23 as described above and operating as the rotary member. The produced yarn or roving 24 is drawn from the spinning basket by means of a known system of drawing cylinders 25 and 26, whereupon it is wound on a bobbin 27. A plurality of such spinning systems can be arranged next to one another along the entire width of the carding roller 21. FIG. 3 shows by way of example two such systems only.

FIG. 4 illustrates the use of a multi-stage spinning basket in the form of a rapidly rotating compacting member provided in a drawing frame as used for the production of carded yarn or similar material. Feed rollers 30 and 31 supply a sliver 32 produced in a known way to a saw-tooth roller 33, which divides the sliver 32 into individual fibres. Such individual fibres 34 are sucked off the surface of the saw-tooth roller 33 by means of a suction device 35, illustrated diagrammatically, into the above described spinning basket 36, which, due to the speed of its rotary movement produces directly the yarn or roving 37.

When the spinning basket 36 revolves with a relatively high number of revolutions, a yarn is produced which is wound on a suitable bobbin 38. At lower velocities of the spinning basket a roving is produced, which is drawn off by means of known roller-systems (not illustrated) and the required twist is then imparted to the roving by means of a twisting and winding spindle of a known type (not shown in the drawing).

I claim:

1. A multi-stage spinning basket for the continuous production of yarn and roving from loose fibres, comprising a rotary ring, at least two systems of conically converging needles carried by said ring, a guiding needle mounted in the ring and extending through the tips of said needle systems, and means for supplying loose fibres to said needle systems, the needles of said systems being differently inclined towards the axis of the spinning basket and having a different length.

2. A multi-stage spinning basket for the continuous production of yarn and roving from loose fibres, comprising a rotary ring, at least two needle systems conically converging towards the axis of the spinning basket, pins provided in said ring, holders pivotally mounted on said pins, the converging needles of at least one system being secured in one arm of said holders, weights secured to the other arm of said holders, said weights being adapted to exert centrifugal force upon rotation of the spinning basket so as to press the ends of the needles against each other in the apex of the cone formed by them, a guiding needle secured in the ring and passing through the apices formed by the needles of the various systems, and means for supplying loose fibres to the needle systems.

3. A spinning basket for the continuous production of a roving from loose fibres, comprising at least two systems of conically converging needles having a common central axis and being turnable about said central axis, the needles of said systems being differently inclined toward said axis; a guiding needle located on said axis and extending through the apices of said needle systems, and means for supplying loose fibers in axial direction to the conical space bounded by one of said systems of conically converging needles.

4. A spinning basket for the continuous production of a roving from loose fibers, comprising a rotary member having an axis of rotation; a set of pivot means mounted on said rotary member along a circle having a center

coinciding with said axis; a system of conically converging needles respectively mounted on said pivot means and forming a cone having an axis coinciding with said axis of rotation; means biasing said needles to turn about said pivot means so that the free ends of said needles located at the apex of said cone are urged toward each other; a second system of conically converging needles located within said first mentioned system and being differently inclined; and means for supplying loose fibers into the conical space defined by one of said systems of needles.

5. A spinning basket for the continuous production of a roving from loose fibers, comprising a rotary member having an axis of rotation; a set of pivot means mounted on said rotary member along a circle having a center coinciding with said axis; a system of conically converging needles respectively mounted on said pivot means and forming a cone having an axis coinciding with said axis of rotation; means biasing said needles to turn about said pivot means so that the free ends of said needles located at the apex of said cone are urged toward each other, said last-mentioned means including centrifugal weights secured to the other ends of said needles; a second system of conically converging needles located within said first mentioned system and being differently inclined; and means for supplying loose fibers into the conical space defined by one of said systems of needles.

6. A spinning basket for the continuous production of a roving from loose fibers, comprising a rotary member having an axis of rotation; a set of pivot means mounted on said rotary member along a circle having a center coinciding with said axis; a system of conically converging needles respectively mounted on said pivot means and forming a cone having an axis coinciding with said axis of rotation; means biasing said needles to turn about said pivot means so that the free ends of said needles located at the apex of said cone are urged toward each other; a second system of conically converging needles located within said first mentioned system and being differently inclined; and a guiding needle located on said axis of rotation and extending through the apex of said needle system so that said free ends of said needles are urged against said guiding needle.

7. A spinning basket for the continuous production of a roving from loose fibers, comprising a rotary member having an axis of rotation; a set of pivot means mounted on said rotary member along a circle having a center coinciding with said axis; a system of conically converging needles respectively mounted on said pivot means and forming a cone having an axis coinciding with said axis of rotation; means biasing said needles to turn about said pivot means so that the free ends of said needles located at the apex of said cone are urged toward each other, said last-mentioned means including centrifugal weights secured to the other ends of said needles; a guiding needle located on said axis of rotation and extending through the apex of said needle system so that said free ends of said needles are urged against said guiding needle; and means for supplying loose fibers into the conical space defined by said system of needles.

8. A spinning basket for the continuous production of a roving from loose fibers, comprising a rotary member having an axis of rotation; a set of pivot means mounted on said rotary member along a circle having a center coinciding with said axis; a system of conically converging needles respectively mounted on said pivot means and forming a cone having an axis coinciding with said axis of rotation; means biasing said needles to turn about said pivot means so that the free ends of said needles located at the apex of said cone are urged toward each other; another system of conically converging needles secured to said rotary member for rotation and being located within the conical space bounded by said first mentioned system of needles; a guiding needle extending along said axis of rotation and passing through the apices of said conical systems of needles so as to be surrounded

by the free ends of said needles; and means for supplying loose fibers into the conical space defined by said systems of needles.

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