March 26, 1968 G. FRANZEN 3,374,618

PROTECTIVE POT FOR TWO-FOR-ONE TWISTING SPINDLES

Filed April 27, 1967 3 Sheets-Sheet 1

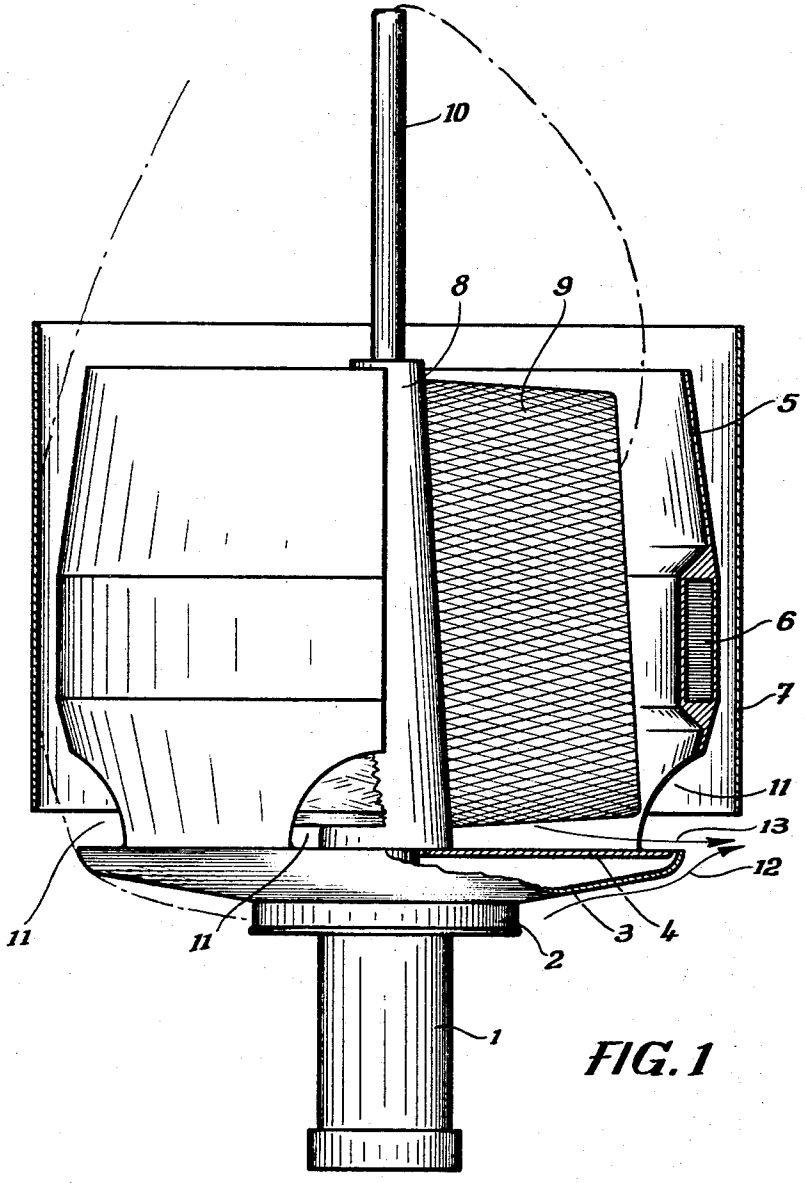


FIG. 1

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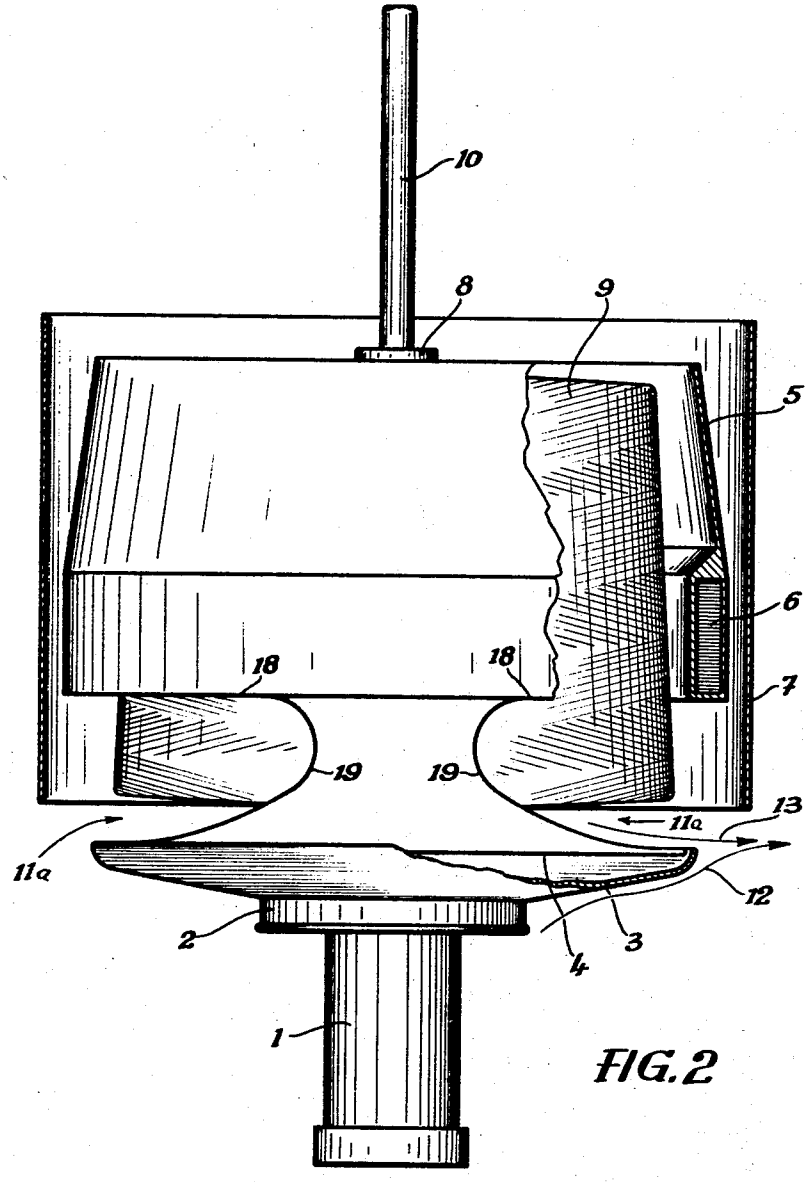


FIG. 2

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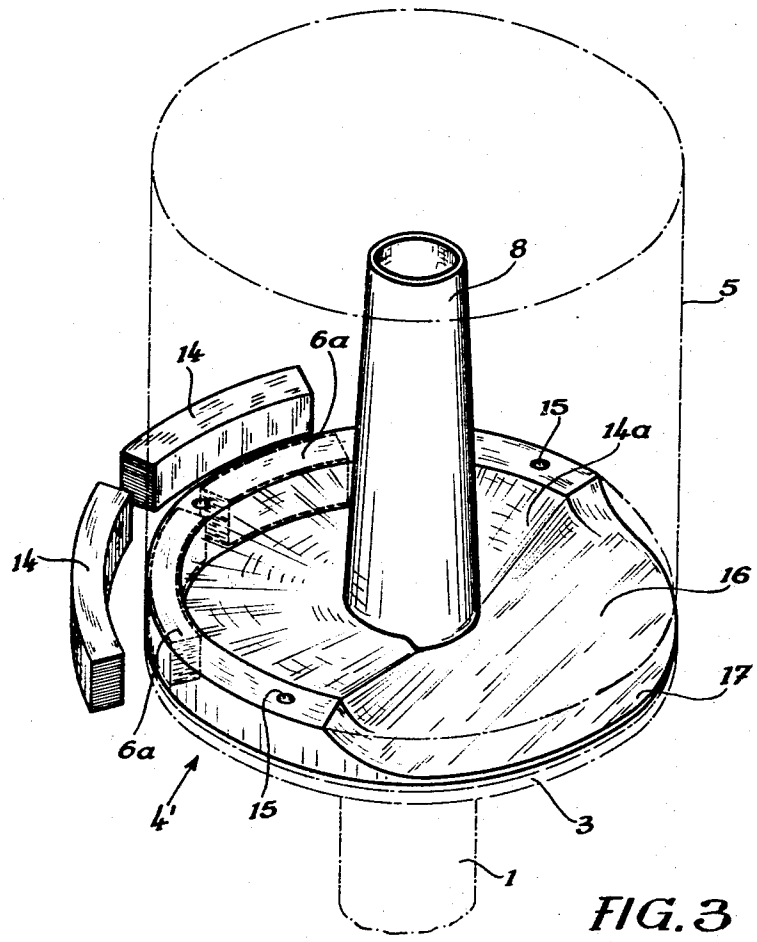


FIG. 3

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PROTECTIVE POT FOR TWO-FOR-ONE TWISTING SPINDLES

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4 Claims. (Cl. 57—56)

ABSTRACT OF THE DISCLOSURE

The present invention relates to a protective pot for two-for-one twisting spindles, in which the pot comprises a bottom portion and a tubular mantle portion which latter adjacent said bottom portion is provided with passage means in which, in view of the rotation of the spindle rotor, a suction is created for withdrawing lint and similar deposits from the bottom of the protective pot.

The present invention relates to a protective pot for two-for-one twisting spindles. With two-for-one twisting spindles, the bobbin carrier is customarily journalled on the driven spindle rotor in such a way that it is relative thereto and independently thereof freely rotatable. The bobbin carrier is secured against rotating together with the spindle rotor by pairs of magnets which are so arranged that one magnet of each pair is mounted on the bobbin carrier while the other magnet pertaining thereto is arranged radially outside of the bobbin carrier on the machine frame or the balloon restrainer which latter may also be designed in the form of a separator.

As indicated by the name itself, the bobbin carrier receives the delivery bobbin from which the thread or threads are withdrawn, or in the case of the so-called inner winding up the bobbin carrier receives the winding up bobbin which is equipped with a drive of its own and has associated therewith a traversing device likewise supported by the bobbin carrier.

With these two types of two-for-one twisting spindles, the thread will, between the exit and entrance opening of the thread storage disc rotating together with the spindle rotor, and the thread guiding member arranged axially above the spindle, move along a path which has the shape of a balloon while the thread circulates around the bobbin on the bobbin carrier. Inasmuch as the balloon shape of the thread path forms only at a higher speed of the spindle rotor, there exists the danger, at least during the start of the spindle rotor, that the thread on its way between the thread storage disc and the thread guiding means axially above the spindle or during its passage in the reverse direction will contact the bobbin whereby a thread break might occur. In order to avoid such a situation, with heretofore known two-for-one twisting spindles, the bobbin is surrounded by a cylindrical or barrel-shaped mantle which is connected to the outer edge or marginal portion of the bobbin carrier so that the bobbin carrier and the mantle form a protective pot the bottom of which is formed by the bobbin carrier proper.

Experience has shown that when processing certain types of yarns, lint may deposit on the bottom of the protective pot. This lint may partially get stuck on the threads and may be turned into the threads. Therefore, it it necessary frequently to clean the interior of the protective pot.

This problem is absent with such bobbin carriers which are designed as wire or sheet metal basket and have a thread rejecting edge at the upper edge only. Such wire or sheet metal baskets, however, lack the necessary strength so that in view of deformations which easily occur in practice, the centering precision, especially of the thread deviating edge, is frequently lost.

It is, therefore, an object of the present invention to provide a protective pot for two-for-one twisting spindles, which will overcome the above mentioned drawbacks.

It is another object of this invention to provide a protective pot for two-for-one twisting spindles, which is characterized in that it is self-cleaning from lint, fiber dust, and the like.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 illustrates partially in view and partially in section a two-for-one twisting spindle according to the present invention.

FIG. 2 shows a two-for-one twisting spindle similar to that of FIG. 1 but modified thereover by a different shape of the recesses in the mantle of the protective pot.

FIG. 3 is a cutout in perspective of a double-walled protective pot bottom with a slide leading into a recess in the mantle of the protective pot.

The protective pot according to the present invention, which is equipped with magnetic bodies having radially outwardly located magnets associated therewith by means of which the protective pot is prevented from rotating together with the spindle rotor, is characterized primarily in that the protective pot mantle is provided with at least one cutout directly adjacent to the upper surface of the bottom of the protective pot, said cutout being of a relatively short height which extends over a partial section of the circumference while the lower edge of said cutout is substantially flush with the upper outer edge of the spindle rotor. The clear cross section of the cutout is so selected that the air flow produced on the outside by the spindle rotor will within the range of said cutout produce a suction effect.

The provision and arrangement of at least one cutout of this type bring about a self-cleaning of the protective pot bottom in view of the air flow conditions created thereby. As mentioned above, the spindle rotor which rotates below the protective pot bottom produces a radially outwardly directed air flow which circulates simultaneously with the spindle rotor and the thread which circulates in the form of a balloon. This circulating air will flow directly above the spindle rotor, namely at the outer edge of the protective pot bottom, produce an underpressure so that in the interior of the protective pot through the cutouts in the protective pot mantle a suction effect will be created by means of which the protective pot bottom will through the said cutouts be freed from lint and the like. Thus, before being able to solidify to knots or the like, the lint, fiber dust, and the like is continuously withdrawn from the interior of the protective pot and can then by means of suction devices be removed from the range of the spindle.

It has proved particularly advantageous to shape the contour of the cutout in the form of a semicircle the diameter line of which is flush with the upper outer edge of the protective pot bottom. Such a design has the further advantage that it can easily be cut into the protective pot mantle which, as a rule, is produced independently of the protective pot bottom and is later connected thereto.

It has been found that under some circumstances fibers get caught at the lower corners of such cutouts. The free fiber end radially hangs outwardly in view of the air flow. Such fiber may then engage the thread which in the form of a balloon circles around the protective pot and may then be taken along with said balloon-shaped thread with the result that a fiber is turned into the thread. In order to avoid such possibilities which can occur with some

types of yarns, the present invention provides that the two edges which form the connection between the lower edge of the respective cutout with the upper edge thereof are in circumferential direction curved outwardly along an arc.

The shape of the two mentioned connecting edges brings about a fiber which might get caught on one of such edges will in view of the upwardly directed component of the air flow move upwardly on said edge and thus move into that area of the thread balloon in which the thread has a greater distance from the protective pot mantle so that the free fiber end can no longer be engaged by the balloon-shaped circulating thread and consequently cannot be turned into the thread. Instead, such fiber will not be engaged by the circulating balloon-shaped thread while the upwardly directed component of the air flow will aid the upwardly moving fiber to get detached from said edge so that it can be removed radially outwardly.

With the arrangement of the cutouts according to the present invention, the location of the magnetic bodies has to be considered by means of which the protective pot is prevented from rotating together with the spindle rotor. With the above mentioned design according to the invention, it is advantageous to arrange the magnetic bodies approximately within the range of the maximum balloon diameter in or on the protective pot mantle, for instance at half the height thereof.

Protective pots have become known in which the bottom unilaterally directly supports the magnetic bodies so that at least within the range thereof the provision of cutouts according to the invention is not possible but such cutouts can be arranged in portions of the mantle which are located opposite said magnetic bodies.

Another heretofore known protective pot is provided with a double bottom while between the bottom walls unilaterally thereof there are provided the magnetic bodies. In such an instance, the present invention suggests that the upper bottom wall within the section free from magnetic bodies be shaped in the form of a gradually outwardly dropping slide which leads into a cutout in the protective pot wall. The lower edge of said cutout is formed by the outer edge of said slide and is substantially flush with the upper edge of the spindle rotor.

With such a design, the above mentioned suction effect will be created by means of which the bottom of the protective pot will be continuously cleaned of lint and the like. The movement of the lint in the direction toward the cutout is aided by the fact that the suction eflect is effective above all within the range of the slide whereby the lint is guided in the direction toward the cutout.

It has been found that with each of the above mentioned designs lint will not deposit or collect in the corners between the bottom and the adjacent marginal edges of the cutout. The lint cannot stay anywhere on the protective pot bottom.

Referring now to the drawings in detail, according to the arrangement shown in FIG. 1, the bobbin carrier is journalled on the spindle rotor **1** provided with the thread deviating or rejecting dish **3** and the thread storage disc **2**. The bobbin carrier is freely rotatable relative to the spindle rotor. The bobbin carrier comprises the protective pot bottom **4** on which is placed the mantle **5** which has an approximately barrel shape. The walls of said mantle **5** within the area of the maximum extension of the thread balloon have arranged therein magnetic bodies **6** which have associated therewith outwardly located holding magnets (not shown) which may, for instance, be connected to the balloon restrainer **7**. The mandrel (not shown) of the bobbin carrier has placed thereon the bobbin **8** with the yarn body **9** which has the yarn wound thereon in a crosswise arrangement and from which the thread is withdrawn in upward direction. The thread is then passed axially downwardly through the hollow spindle shank **10** and then passes radially outwardly from the thread storage disc **2** of the spindle rotor **1**. Thereupon the thread again passes upwardly and, more specifically, in the form of a balloon while circulating around the mantle **5** of the protective pot but within the balloon restrainer **7**. Finally, the thread is then axially above the hollow spindle shank **10** passed through a thread guiding member and is wound up further above.

According to FIG. 1, directly above the protective pot bottom **4**, the protective pot mantle **5** is provided with four semicircular cutouts **11**. However, it should be noted that the invention is not limited to four of such cutouts but that the number of the cutouts may be less or more. The diameter line of the semicircle of said cutouts is preferably precisely located in the upper plane of the outer edge of the protective pot bottom **4** so that any lint which might collect on the said bottom **4** can freely radially move outwardly through said cutouts **11**. This movement is created by the fact that the spindle rotor **1** the upper outer edge of which, namely the outer edge of the thread rejecting or deviating dish **3**, is approximately flush with the lower edge of the cutouts **11**, produces an air flow as indicated by the arrow **12**. This air flow will within the range of said cutouts **11** produce a suction **13** by means of which lint collected on the protective pot bottom **4** will be drawn outwardly through the cutouts **11**. In this way the protective pot bottom **4** will continuously be freed and kept free from fibers and the like.

Also with the embodiment according to FIG. 2, two cutouts **11*a*** are provided directly above the slightly outwardly dropping protective pot bottom in the mantle **5**. The lower edge of said cutouts **11*a*** is formed by the outer edge of the protective pot bottom **4** to which the upper edge **18** is parallel. The two edges are connected to each other by the edges **19** which in the circumferential direction are arched outwardly. They gradually merge with the upper and lower edges.

The self-cleaning of the protective pot bottom **4** is due to the fact that the thread rejecting or deviating dish **3** as a part of the spindle rotor **1** will during its rotation produce an air flow according to arrow **12**. This air flow will within the range of the cutouts **11*a*** produce a suction **13** by means of which lint collected on the protective pot bottom **4** is drawn outwardly through the cutouts **11*a***. Any fibers which might get caught on an edge **19** will in view of the rising component of the air flow have the tendency to move upwardly on edge **19** and to fly off outwardly. If, however, this should initially not occur, the said upward movement will bring about that the fibers which get caught on edge **19** will be removed from the thread balloon area directly adjacent to the lower edge of the cutout **11** and will be moved to an area where the thread balloon has a greater expansion so that the balloon-shaped circulating thread will no longer be in the danger of contacting such fiber, tear the same off, and turn the same into the circulating thread. Thus, it will be realized by the present invention that fibers which might get caught on the edges **19** will similar to lint and fiber dust collecting on the protective pot bottom be moved radially outwardly away from the area of the protective pot while temporarily caught fibers will move into a position in which they are relatively far spaced from the thread circulating in the form of a balloon.

A self-cleaning of the protective pot bottom is also realized with the embodiment according to FIG. 3 of the drawing in which the protective pot bottom has a double wall. According to FIG. 3, the spindle rotor **1** and the thread rejecting or deviating dish **3** as well as the cylindrical protective pot mantle **5** are indicated by dot-dash lines only. The protective pot bottom **4'** comprises the covered lower circular disc-shaped bottom wall and the upper bottom wall **4*a*** around which extends the protective pot mantle **5**. Between the lower bottom wall and the upper bottom wall **4*a*** there are provided circular segment-shaped magnetic bodies **6*a***. Radially outwardly of said segment-

shaped magnetic bodies **6***a* and in radially spaced relationship thereto there are provided circular segment-shaped outer magnets **14** which may be connected to a balloon restrainer in conformity with FIG. 1.

The lower bottom wall and the upper bottom wall **4***a* are connected to each other by rivets or the like whereby the magnetic bodies **6***a* are firmly held therebetween.

On that side which is located opposite the magnetic bodies **6***a*, the upper bottom wall **4***a* drops in the manner of a slide **16** gradually toward the outside onto the level of the lower bottom wall. The outer edge of the protective pot mantle **5** has a flat cutout **17** the lower edge of which is formed by the outer edge of the slide **16**, whereas the upper edge of said cutout **17** is located at the level of the upper bottom wall **4***a* outside the slide **16**. In this way the cutout **17** will assume the shape of at slot which gradually tapers at the ends and extends over a portion of the circumference. In view of this slot, the lint or the like collecting on the upper bottom wall **4***a* can move out of the protective pot which is due to the suction effect created by the air flow **12** according to FIGS. 1 and 2 and effective on the bottom **4** as indicated in FIGS. 1 and 2 by the arrow **13**. To this end, it is required that the lower edge of the cutout **17** or the outer edge of the slide **16** is substantially flush with the upper outer edge of the thread deviating or rejecting dish **3** of the spindle rotor **1**.

Although the embodiment of FIG. 3 has only a single cutout **17**, the design of the protective pot bottom **4'** with the slide **16** directed toward the cutout **17** will assure a complete withdrawal of lint from the protective pot bottom **4'**. In this connection it is also assured that no lint will remain stuck at the ends of the cutout **17** in the corners thereof.

Similar to the embodiments of FIGS. 1 and 2, also in this instance a self-cleaning of the protective pot bottom **4'** will be assured and the danger is eliminated that lint interferes with the spinning or twisting operation by moving with the thread or by being turned into the thread.

It is, of course, to be understood that the present invention is, by no means, limited to the particular embodiments shown in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. In combination with a rotatable spindle rotor for two-for-one twisting spindles: a protective pot journalled on said rotor and adapted to be held stationary relative

to said rotor, said protective pot including a bottom and a tubular mantle mounted on said bottom substantially co-axially therewith, said mantle being at the lower marginal area thereof provided with at least one cutout extending over a circumferential section of said mantle with the lower edges of said cutout located at least approximately in the plane defined by the upper outer edge of said spindle rotor, the clear cross-section of said cutout being such that the air-flow produced by the rotating spindle rotor will create a suction within the area of said cutout.

2. The combination according to claim **1**, in which each cutout has a semi-circular contour with the area of the largest extension thereof directly adjacent the upper surface of said bottom of said protective pot.

3. The combination according to claim **1**, in which each cutout has its lateral edges which connect the lower edges of the cutout with the upper edge thereof concavely arched with regard to each other.

4. The combination according to claim **1**, in which said protective pot bottom has an upper and a lower bottom wall, segmental magnet means unilaterally arranged on said pot and located between said bottom walls, the top surface of said upper bottom wall within an area free from segmental magnet means gradually declining toward that peripheral portion of said pot bottom which is remote from said magnetic means, the outer peripheral edge portion of said outwardly declining bottom top surface being located in approximately the plane through the lower edges of said cutout.

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