A textile bowl is clamped onto a carrier shaft by a sleeve secured within the bowl and which is a sliding fit on the shaft. An end-cap has a conical bore, the wider end of which receives a deformable end of the inner sleeve. Screwing home the end-cap onto the textile bowl causes the deformable end to be urged inwards thereby clamping it around the shaft, by the conical bore. This arrangement may be provided at both ends of the textile bowl, the frictional engagement of the end-caps with the ends of the inner sleeve ensuring that the inner sleeve is fixed with respect to the textile bowl.
TEXTILE BOWL AND THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to textile bowls (which are sometimes referred to in the art as take-up bowls) and the like.

As is known in the art, textile bowls are generally used as driving rollers for the cores on which textiles are wound. Hitherto, the attachment of a textile bowl to its carrier shaft has been effected by means of a grub screw or a lock nut at each end of the bowl.

There has for a long time existed a need for some improved means for fixing such bowls to their shafts and persons who have attempted to supply this need have not hitherto realised that the problem could be satisfactorily solved in the novel manner disclosed hereinafter.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide means by which a textile bowl or similar element may be attached to its carrier shaft in a rapid, simple yet reliable manner.

It is a further object to produce textile bowls that are easier to fix and cheaper to manufacture than the known textile bowls.

It is yet another object to provide a textile-bowl construction that does not necessitate, for assembly, the use of grub screws or the like, which may work loose during operation and be lost.

The present invention provides means by which a rigid, sleeve-like element, for example a textile bowl, may be attached to a carrier shaft, comprising a clamping member adapted to receive the shaft and having a surface or surfaces which can be deformed (which term includes a change in either conformation or configuration) to clamp tightly the carrier shaft, means for rigidly attaching the sleeve-like element to the clamping member and means adapted to deform the said surface or surfaces to achieve clamping of the carrier shaft.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, partly in section, of an assembled textile bowl of this invention clamped at both ends to a carrier shaft,

FIG. 2 is a perspective view, partly in section, of part of a textile bowl that is adapted to be clamped at one end only to a carrier shaft, and

FIG. 3 is a perspective view of an end of a clamping member that is an alternative to that shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS.

It is normally required that the clamping member be located within the sleeve-like member in the final assembly. To this end, the clamping member is generally substantially in the form of a hollow cylinder adapted to fit slidably over the carrier shaft and having one end deformable so that the internal surface at this end may be caused, on deformation thereof, to engage frictionally the shaft and thereby clamp it.

Deformability of an end-portion of such a cylindrical clamping member may be achieved by providing this end-portion with a frustoconical external configuration tapering towards the extremity of the said end-portion. Alternatively, the end-portion may be provided with longitudinal slits extending from its extremity, thereby forming a number of tongues which may be urged towards the longitudinal axis of the cylindrical clamping member in order to achieve a clamping action on a shaft located within the clamping member.

The clamping action may be effected by means of a substantially disc-like member (preferably in the form of an end-cap for the sleeve-like element) having an axially aligned conical bore adapted to accommodate the carrier shaft, the wider end of the conical bore being adapted to receive the deformable end of the cylindrical clamping member. Advancing the disc-like member onto the hollow cylindrical clamping member will cause the end of the latter to be deformed by the progressively diminishing cross-section of the bore. Conveniently, the disc-like member is provided with a screw-thread on its circumferential surface, this screw-thread co-operating with an internal screw-thread provided on the sleeve-like element. The disc-like member may be provided with means, such as a boss or a plurality of holes, for engagement by a suitable locking tool, e.g. a spanner, to enable it to be screwed into the sleeve-like member.

The cylindrical clamping member (in cases where only one end thereof is deformable) may be rigidly attached to the sleeve-like element, conveniently at its end remote from the deformable end, by any suitable means. For example, the end of the sleeve-like element remote from the end adapted to receive the disc-like member described above may be provided with a transverse wall (generally in the form of an end-cap and which may be either integral with the sleeve-like element or removably located therein) having a screw-threaded longitudinal bore therein; the cylindrical clamping member may be provided with an external screw-thread at its end remote from the deformable end to enable it to be screwed into the said bore in the said transverse wall. An annular bead or shoulder on the cylindrical clamping member is preferably provided in order to act as a stop; the clamping member can then be screwed firmly home with the stop abutting the transverse wall. Alternatively, the cylindrical clamping member could be permanently fixed within a central bore in the transverse wall, as by welding.

However, it has been found advantageous to provide a cylindrical clamping member having both ends deformable. In this case, each end of the outer, sleeve-like element is adapted to receive a disc-like member, each member deforming a respective end of the clamping member when screwed into the outer sleeve-like element. This particular construction is especially advantageous in that the shaft is clamped in two places, thereby giving a firmer attachment. Furthermore, since the cylindrical clamping member is not permanently attached to the outer sleeve member the replacement of worn parts is made cheaper. The frictional engagement between the ends of the clamping member and the disc-like members should be sufficient to ensure that the outer, sleeve-like element is rigidly-yet removably - attached to the internal clamping member.

The components of the textile bowl may be made of any suitable materials such as metals, although plastics materials and composites (especially synthetic-resin-bonded paper) are preferably used. The inner clamping sleeve is preferably resilient to permit easy disassembly from the shaft.

It will be seen that the present invention is applicable to hollow rollers other than textile bowls, but it is particularly useful when applied to textile bowls.
The invention will now be described in greater detail by referring to the embodiments illustrated in the drawings, in which like parts are designated by like numerals.

Referring to FIG. 1, the textile bowl 1 comprises a hollow, cylindrical outer sleeve 2 having an internal screw-thread 3 at each end. Located within the outer sleeve 2 is a substantially cylindrical inner sleeve or tube 4 having an internal bore 5 of such a dimension as to permit a sliding fit over the shaft 6 to which the textile bowl 1 is to be attached. The outer surface 7 of each end of the inner sleeve 4 is tapered to provide an external frustoconical configuration.

The outer and inner sleeves 2 and 4 are attached one to the other with their longitudinal axes coincident by means of two substantially disc-like end-caps 8, each of which is provided with a substantially central, longitudinal conical bore 9. Each end-cap 8 is provided with an external screw-thread 10 co-operating with an internal screw-thread 3 of the outer sleeve 2 so that it can be screwed into the outer sleeve. The rim of each end-cap 8 is provided with a shoulder 11 to limit the advance of the end-cap 8 into the outer sleeve 2.

An hexagonal centre boss 12 is provided within a recess 13 in the outer face of each end-cap 8, the bore 9 extending there-through, to enable the end-cap 8 to be screwed home (for example, by means of a spanner (not shown)). Alternatively the end-caps 8 could be provided with a series of holes to permit rotation thereof by means of a suitable key or C-spanner (this alternative is not illustrated).

Of the many materials from which the sleeves 2 and 4 may be manufactured, the synthetic-resin-bonded paper material known by the trade-name “Lantex” is especially useful. The end-caps 8 are conveniently plastics mouldings.

The textile bowl 1 may be assembled by screwing one end-cap 8 partially into an end of the outer sleeve 2 (say, to about one-eighth of an inch of the shoulder 11). The inner sleeve 4 is then positioned within the outer sleeve 2 with an end 7 thereof located in the conical bore 9 of the said end-cap. The second end-cap is then screwed partially into the other end of the outer sleeve (again to, say, about one-eighth of an inch of its shoulder).

The assembly is then mounted onto the shaft 6 and both end-caps 8 are screwed home until the shoulders 11 firmly abut their respective ends of the outer tube 2. This tightening of the end-caps 8 causes the end-portions 7 of the inner sleeve 4 to close onto the shaft 6, thereby locking the assembled textile bowl 1 onto the shaft 6.

Advantageously, in the embodiment of FIG. 1 the deformable ends 7 of the inner sleeves 4 are congruent and the end-caps 8 are congruent such that the end-caps 8 are interchangeable.

As mentioned above, it is possible to clamp or lock a textile bowl at one end only thereof. In FIG. 2, there is illustrated means whereby the inner clamping tube or sleeve may be firmly located, at its end remote from the deformable end, in an end-cap.

In the embodiment of FIG. 2, one end-cap 8a is provided with an external screw thread 10 whereby it may be screwed into an end of the outer sleeve 2, which end is provided with an internal screw thread 3 for this purpose. Again, an hexagonal boss 12 is provided to facilitate manipulation of the end-cap 8a.

The end-cap 8a is provided with a central, longitudinally aligned tapped bore 14 into which the inner clamping tube or sleeve 4 may be screwed by virtue of the external screw thread 15 provided at the end of the inner sleeve 4a that is remote from the deformable end (not shown). An annular bead 16 is provided on the inner sleeve 4a generally, this is so positioned that when it firmly abuts the inner face 17 of the end-cap 8a the extremity 18 of the screw threaded end of the inner sleeve 4 is flush with the external face 19 of the hexagonal boss 12.

To assemble the textile bowl of FIG. 2, the inner sleeve 4a is screwed firmly home into the end-cap 8a. The end-cap 8a is then screwed into sleeve 2 as far as the shoulder 11 will permit so that the inner sleeve 4a is firmly located within the outer sleeve 2 and along the longitudinal axis thereof.

The construction of the textile bowl of FIG. 2 at its end remote from the end-cap 8a is identical to that shown in section in FIG. 1, thereby providing the means by which the textile bowl of FIG. 2 may be locked onto a carrier shaft.

It will be appreciated that end-cap 8a serves essentially as a transverse wall whereby the inner clamping sleeve is firmly attached to the outer sleeve: unlike end-cap 8 it takes no part in the clamping action.

Textile machinery often is required to run continuously for long periods at a time and, accordingly, users will normally require the extra margin of safety offered by locking the textile bowl at both ends, as in the case of the embodiment of FIG. 1. However the arrangement of FIG. 2 may sometimes be useful in certain applications.

In FIG. 3, there is shown an alternative means of attaining deformability in an end of a cylindrical clamping tube or sleeve. As shown, the extremity 18a of a clamping tube or sleeve 4b is provided with a series of regularly spaced slots 20 that extend longitudinally back along the tube 4b for a short distance. The slots 20 define a plurality of tongues 21. These tongues are provided with a slight bevel 22 adjacent the extremity 18a of the tube 4b.

A clamping tube 4b having both ends provided with the configuration shown in FIG. 3 may be substituted for the clamping tube 4 shown in FIG. 1. On assembling the textile bowl in the manner described above, the tongues 21 will be urged towards the longitudinal axis of the tube 4b by the conical bore 9 of the end-cap 8, thereby locking the inner sleeve or tube 4b onto the carrier shaft 6.

The resistance of tongues 21 to deformation is, of course, less than that of a solid annulus as shown in FIG. 1, and the embodiment of FIG. 3 is therefore appropriate when the inner clamping sleeve is of a fairly stiff material.

What is claimed is:

1. A textile bowl comprising:
   a rigid, sleeve-like outer element having an end, the said end being provided with an internal screw thread;
   a hollow, generally cylindrical inner element having one end thereof deformable;
   means for attaching the said outer element rigidly to the said inner element such that the longitudinal axes thereof are substantially coincident, and such that the said deformable end of the said inner ele-
3,738,591

1. An textile bowl comprising: a generally disc-like member having a circumferential surface and provided, along its longitudinal axis, with a conical bore having a wider end which is adapted to receive the extremity of the said deformable end of the said inner element; the said circumferential surface bearing a screw thread co-operating with the said internal screw thread of the said outer element, the said disc-like member being advanced onto the said deformable end of the inner element, the said deformable end being thereby deformed by the conical bore.

2. An textile bowl of claim 1, in which the means attaching the said inner element to the said outer element consists essentially of a transverse wall circumferentially attached rigidly to the said outer element and having a central bore in which the said inner element is secured.

3. An textile bowl of claim 1, in which the said deformable end of the said inner element is provided with a plurality of tongues that are urgeable towards the longitudinal axis of the said inner element thereby effecting a clamping action.

4. An textile bowl of claim 1, in which the said deformable end of the inner element has an external, generally frustoconical configuration.

5. An textile bowl of claim 4 in which the said disc-like member is provided with means for engagement by a spanner to achieve screwing of the said disc-like member into the said outer element.

6. A textile bowl comprising: a rigid, sleeve-like outer element having at each end thereof an internal screw thread; a hollow, substantially cylindrical inner element hav-