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2,844,333

RESILIENT BOBBIN

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FIG. 1.

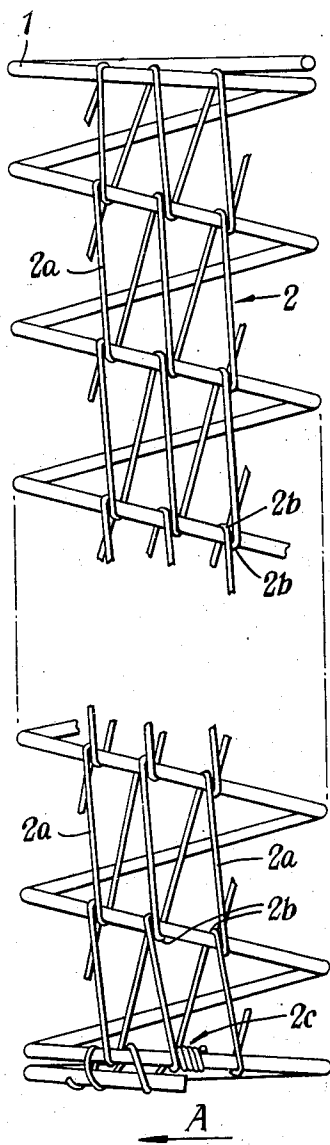
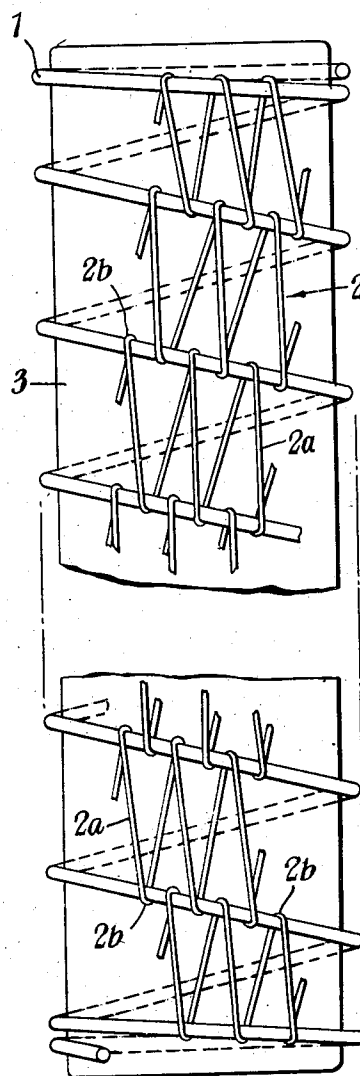


FIG. 2.



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RESILIENT BOBBIN

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2 Claims. (Cl. 242—118.11)

This invention relates to skeleton cores or bobbins of the kind composed of a helical spring encased within a cage-like sheath formed by a length of wire laced progressively around adjoining coils of the spring from one end of the latter.

Such skeleton core or bobbin structures are commonly employed in the treatment of textile fibres which are wound thereon into the form of a cheese or cop. For this purpose the skeleton structure is mounted on a mandrel which must be a tight fit within the structure to prevent slippage. To obtain an effective frictional grip it is, however, necessary for the known skeleton structures to be made exactly to fit the mandrel, within very narrow limits, and this gives rise to serious manufacturing difficulties.

A main object of the invention is largely to obviate the need for exact fitting, thereby avoiding the aforementioned difficulties. Accordingly the invention provides a skeleton core structure composed of a helical spring encased within a cage-like sheath formed by a length of wire laced progressively, in substantially equally spaced turns, around adjoining coils of the spring from one end of the latter to permit limited radial spring movement, the characteristic feature being that the said lacing is applied whilst the spring is radially expanded under an externally applied torsional force and acts, by abutment between oppositely directed lacing turns around individual spring coils, when said force is removed, to prevent the laced spring returning to the position which would, but for the lacings, be its neutral position of rest, whereby the whole of said permitted spring movement is available for further radial expansion of the spring.

In order that the invention may be clearly understood and readily carried into effect an embodiment thereof will now be described in detail with reference to the accompanying drawings in which:

Figure 1 is a side elevational view showing a skeleton core or bobbin structure laced in accordance with the invention, part of the lacing being broken away for purposes of clarity, and

Figure 2 is a view similar to Figure 1 but showing the structure in position over a mandrel, the latter being in chain-dotted lines.

Referring now to the drawings, a skeleton core or bobbin structure is composed of a main helical spring 1 and a lacing wire 2 which is bound in uniform zig-zag turns 2a around adjoining coils of the spring 1 over the whole length of the spring so that the spring coils

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pass through turn loops 2b in the lacing wire which are directed alternately towards opposite ends of the spring. Each end 2c of the lacing wire is firmly secured to the adjoining end of the spring and the lacing turns 2a are spaced along adjoining spring coils to permit twisting of the spring and consequential radial movement of the laced structure over a limited range determined by the spacing of the lacing turns. In the drawings only one end 2c of the lacing wire 2 is shown but it will be appreciated that the opposite wire end is secured in exactly the same manner to the opposite end of the helical spring 1.

The lacing wire 2 is applied to the spring 1 whilst the latter is twisted in the direction of unwinding and thus radially expanded under torsion. The reaction of the spring, therefore, when the expansive force is removed, tends radially to contract the structure to the neutral position of rest of the spring but this is prevented by abutment between adjoining oppositely directed lacing loops 2b around each spring coil as illustrated in Figure 1. The structure is conveniently dimensioned so that, when thus held under torsion by the lacing, the minimum internal diameter is slightly less than the external diameter of a mandrel 3 to be fitted therein so that the structure has to be further radially expanded to receive the oversize mandrel. Such radial expansion is effected by turning the lower end of the spring 1 in the direction of the arrow "A" and, at the same time, either holding the upper spring end or turning this upper end in the opposite direction. As a result, the spring will be ultimately under considerable torsion as shown in Figure 2 and will exert a very firm grip on the inserted mandrel 3.

With the foregoing arrangement, the mount by which the external diameter of the mandrel 3 exceeds the internal diameter of the laced structure can vary sufficiently to provide adequate manufacturing tolerances since virtually the whole range of permitted radial movement of the structure will be available in the expansive direction to permit entry of the mandrel.

I claim:

1. A skeleton core structure comprising a radially expanded helical spring, and a length of wire laced progressively in substantially equally spaced turns around adjoining coils of the spring from one end of the latter to the other, said turns being spaced to maintain the spring in a partially expanded condition by abutment of adjacent turns, the spacing of adjacent turns permitting a determinable radial expansion of the spring.

2. A skeleton core structure as claimed in claim 1 in combination with a mandrel having an external diameter which is slightly oversize in relation to the minimum internal diameter of the laced structure, whereby the latter has to be further radially expanded against considerable spring reaction to fit over the mandrel which is then gripped firmly by the structure.

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