Nov. 17, 1953 F. C. GUYER 2,659,543

WINDING CORE

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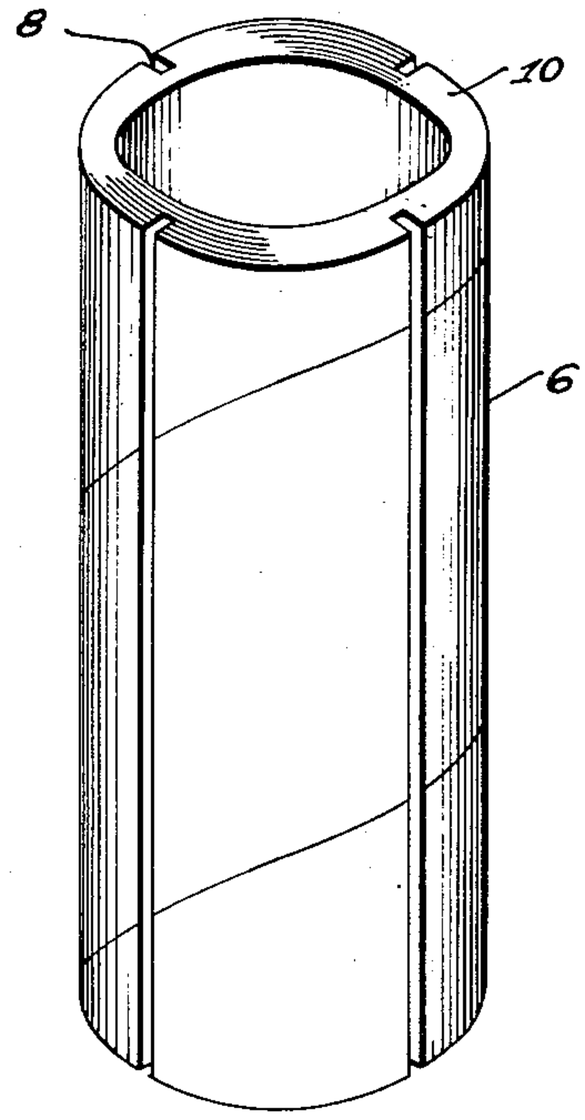
Fig. 1



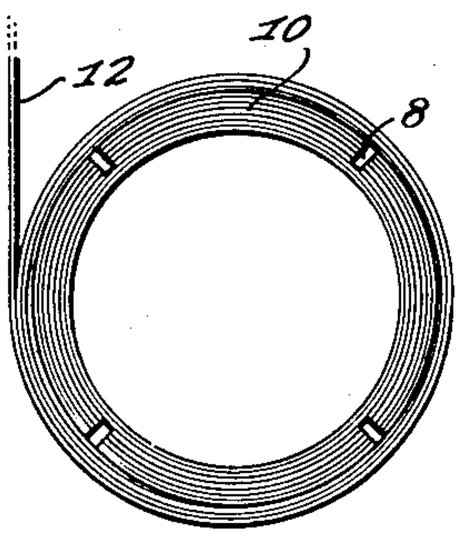


Fig. 2

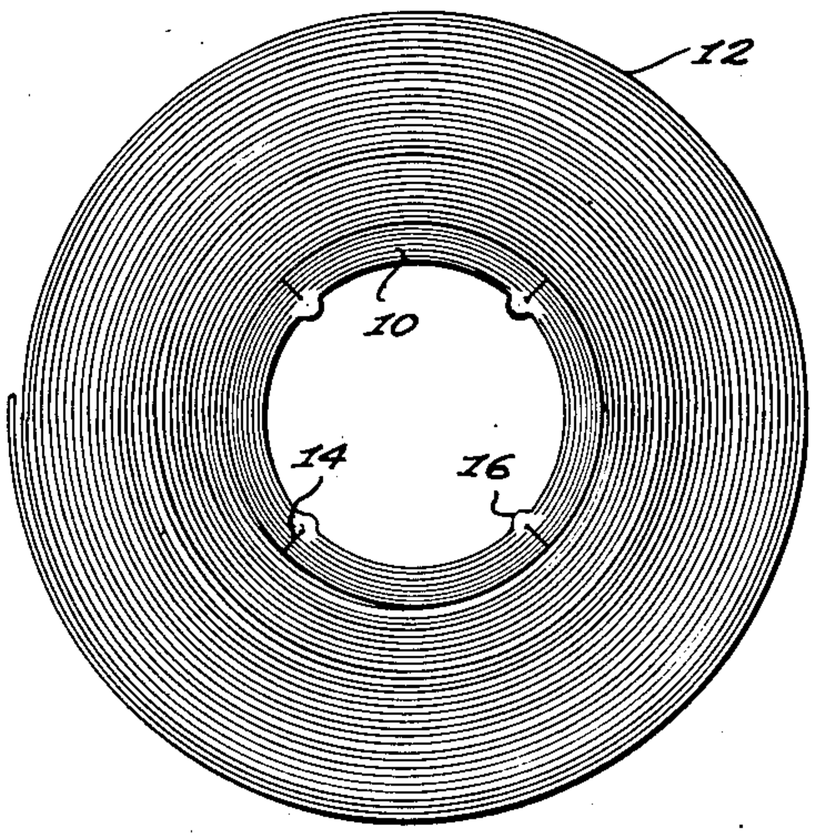


Fig. 3

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WINDING CORE

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4 Claims. (Cl. 242—72)

1

This invention relates to a winding core adapted for supporting rolls of elastic material, such as cellophane tape, friction tape and the like.

In winding strips of adhesive materials, such as these just mentioned, the common practice is to provide a relatively strong winding core of tubular or annular shape about which the material is convolutely wound to form the desired roll. Most tapes of this type exhibit a certain amount of elasticity and in winding them onto the core, the web must be maintained taut to prevent wrinkling or uneven winding. As the roll becomes larger in the winding process, however, an increasing compressive stress is developed, and difficulty is often encountered with crushing of the core as a result of this stress.

In accordance with the present invention, a winding core is provided which is uniquely adapted to be deformed according to a predetermined plan by the above noted compressive stress without having its general tubular shape altered and without completely collapsing. For this purpose, the winding core of the present invention is formed with one or more grooves or slots in its peripheral surface extending longitudinally throughout the length of the core. These grooves are so formed that the roll will normally be self-supporting and the tape or other elastic material can be wound thereon without difficulty. When the compressive stress on the core becomes sufficiently great, however, the inner layers of the core at the location of the peripheral grooves buckle inwardly and the adjacent segments of the core walls are forced together to close the longitudinal grooves. This reduces the circumference of the tube and effectively relieves the compressive stress developed during winding.

The present invention is described further below in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of a winding core constructed in accordance with the present invention;

Fig. 2 is an end view of the winding core shown in Fig. 1, and illustrating its disposition as the winding of material thereon is begun; and

Fig. 3 is a corresponding end view showing the completed roll of material and illustrating the collapsing action of the winding core.

Referring now in detail to the drawings, the tubular winding core of the present invention may be conveniently formed by convolutely or spirally winding a paper strip or blank to form a multi-ply tubular core 6. This core 6 might

2

also be formed of a suitable plastic material if desired. In any case, the core 6 provided is then appropriately machined or cut to form a plurality of grooves or slots 8 which extend longitudinally along the periphery of the core 6 and are spaced at uniform intervals around its circumference. In the usual use these grooves 8 should be cut to a depth of about three-fourths the thickness of the core wall 10 but should not be sufficiently deep that the core 6 is not self-supporting or is too easily crushed.

When a web of material 12 having elastic properties is wound onto core 6, the web 12 must be held taut with the result that it is wound onto the core under tension in a slightly stretched condition. As the roll increases in thickness, this tension accumulates to develop a compressive stress on core 6 which increases correspondingly. If this stress becomes sufficiently great, the inner layers of the core 6 at the slots 8 press inwardly and the side walls of the grooves are forced together, as shown at 14 in Fig. 3, to form on the inner surface of the core 6 at each collapsed groove a longitudinal rib or ridge, as shown at 16 in Fig. 3. Thus, the circumference of core 6 is reduced and the compressive stress is relieved.

These winding cores 6 can be formed with as many grooves 8 as the situation requires. It is preferred that the grooves 8 be spaced uniformly around the circumference of the core 6. In some instances, it may be that not all the grooves 8 will be closed, but by making them of appropriate size, they will collapse as necessary to relieve the stress. The depth of the longitudinal grooves 8 must be sufficient to weaken the wall 10 so that it will collapse at the point of the longitudinal groove 8 before the side wall collapses and its true annular shape is deformed. These grooves 8 should be formed in such a way that the opposite edges fit tightly together when they collapse.

I claim:

1. A winding core adapted for supporting a roll of elastic material wound thereon, comprising an annular multi-ply paper body, having at least one longitudinal groove opening in the periphery thereof, said groove being of sufficient depth to make a substantial number of the outer plies of said paper body discontinuous and thereby weaken the core wall so that a compressive stress of sufficient magnitude imposed by said material wound thereon will cause the remaining inner plies of the core to buckle inwardly of said annular body at said groove and draw the edges of said groove together, thereby reducing

the circumference of said core and relieving the compressive stress thereon.

2. A core adapted for supporting a roll of elastic material to be wound thereon, comprising a round multi-ply tubular paper body having a plurality of spaced longitudinally extending grooves opening in the outer peripheral surface thereof and formed in a depth sufficient to render a substantial number of the outer plies of said paper body discontinuous and thereby weaken the walls of the core to the extent that any excessive compressive stress developed as said material is wound thereon will collapse said core at the grooves without destroying its tubular configuration, whereby the circumference of said core is reduced accordingly and said compressive stress is relieved.

3. A tubular multi-ply paper winding core adapted to support a roll of elastic material wound thereon, comprising a spirally wound paper body having formed in its outer peripheral surface a plurality of spaced longitudinal grooves running the length of said core, said grooves extending radially inward from the outer peripheral surface of said paper body and being of sufficient depth to render a substantial number of the outer spiral windings of said paper body discontinuous and thereby weaken the walls of said core to compressive stress imposed by said material wound thereon, whereby a radially inwardly applied compressive stress causes the inner wall portion at the grooves to buckle inwardly of said

paper body and said grooves to become closed, whereby said core is reduced in circumference sufficiently to relieve said compressive stress without losing its tubular form.

4. In an annular multi-ply paper winding core adapted for supporting a roll of elastic material wound thereon, means for uniformly relieving compressive stress on said core without altering the annular configuration thereof comprising a plurality of grooves extending longitudinally along the outer periphery of said core and having a depth of about three-fourths the thickness of said core wall rendering the outer plies of said core discontinuous to the extent of said depth, whereby said wall is weakened sufficiently to buckle inwardly of said core at the said grooves and reduce the circumference of said core without appreciably weakening said core.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,328,335	Fryer et al.	Aug. 31, 1943
2,338,513	Helm	Jan. 4, 1944
2,350,369	Sampair et al.	June 6, 1944

FOREIGN PATENTS

Number	Country	Date
269,307	Great Britain	Apr. 21, 1927