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W. P. TAYLOR, JR

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PACKAGE OF FLEXIBLE MATERIAL

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Fig. 1.

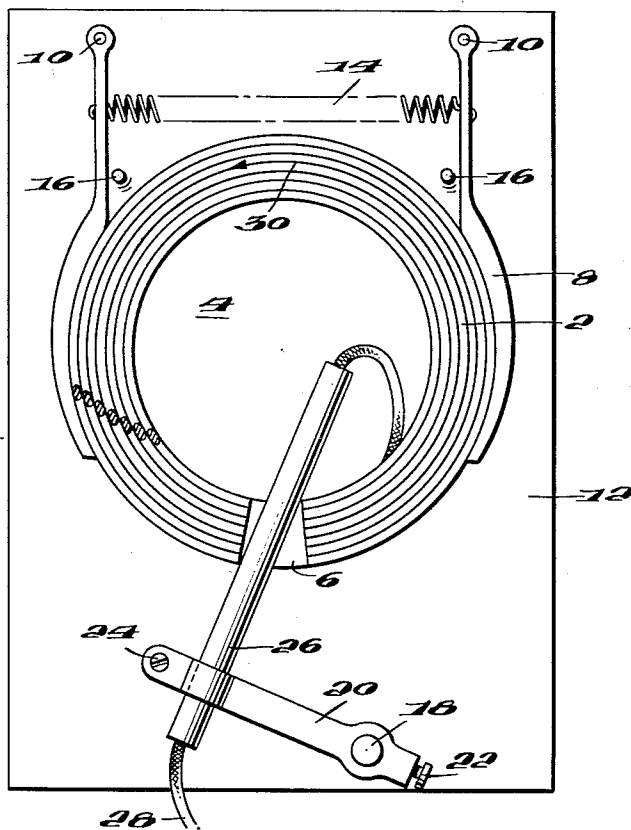
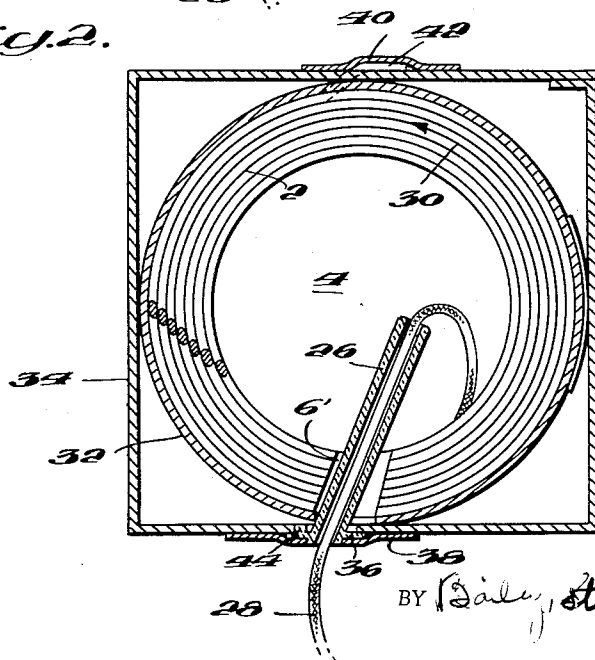


Fig. 2.



INVENTOR
WALTER P. TAYLOR, JR.

BY *Daily, Stephens & Hattley*
ATTORNEYS

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PACKAGE OF FLEXIBLE MATERIAL

Walter P. Taylor, Jr., New York, N. Y.

Application March 26, 1953, Serial No. 344,872

10 Claims. (Cl. 242—159)

The invention relates to packages of flexible material, and more particularly to an arrangement for facilitating the withdrawal of material from such packages. It is more especially directed to the withdrawal of material from packages in which the twist is equalized so that kinking and snarling are avoided.

The invention is applicable to packages of flexible material wound in a body around an annular core space and having an opening through the body into the core space through which the free inner end of the material is withdrawn, and is especially valuable in conjunction with a body formed of a plurality of coils each forming at least one figure 8. Such packages are described in my applications S. N. 693,441, filed August 28, 1946, now Patent No. 2,634,923, and S. N. 107,165, filed July 28, 1949, now Patent No. 2,634,922, and in my applications entitled "Winding Flexible Material," Serial Nos. 344,874 and 344,876 executed of even date herewith.

In my Patent No. 2,634,922, a package is described in which a tube is inserted through and is secured in position in the radial opening. This is a rigid tube having its inner end, which forms the annular guiding surface for the flexible material, substantially at the center of the core space.

Even with such a tube, the inner coils are still likely to come loose two or more at a time, which may cause tangling of successive coils so as to interfere with the withdrawal, and kinking or bending may also occur especially as the material is being withdrawn from the area around the opening.

The principal object of the present invention is to provide an improved arrangement for dispensing material from such packages.

Another object of the invention is to provide an arrangement in which kinks and snarls are more surely avoided.

A further object of the invention is to provide an arrangement which is less likely to cause several coils to come loose at the same time.

In withdrawing material from such packages, there is some danger that several coils may come away from the body at the same time and become entangled, since the pull of the flexible material may be transmitted through several successive loops. The present invention reduces the danger of this entanglement, by causing the tightening of the coil which is being withdrawn, that is, the pulling of this coil inwardly away from the body of the package, to take place progressively rather than through the entire coil so that succeeding coils are not subjected to any tendency to tighten.

Another object of the invention is to provide a package in which this result is achieved.

Still another object of the invention is to provide a holder for such packages.

In general, the invention contemplates the mounting of the tube not radially, as in my application S. N. 107,166, now Patent No. 2,634,918, issued May 14, 1953, but at an angle to the radius, the free end of the tube

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which forms the annular guiding surface lying on that side of the hole on which the material is wound last in forming the package.

Further objects and advantages of the invention will appear more fully from the following description, especially when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

Fig. 1 shows in plan view, with the package in section, a package embodying my invention with a holder therefor; and

Fig. 2 shows in cross-section a modified form of the invention.

In Fig. 1, the package is formed as shown in my Patent No. 2,634,922. In this package, there are a plurality of coils in each layer, each coil being in the form of at least one figure 8, the cross-overs of successive coils being angularly displaced around the package, the cross-overs being interrupted at the same angular position in successive layers to form the opening.

In this figure, 2 is the body of the package formed of several layers of coils, 4 is the central core space and 6 is the opening through the body into the core space. The package is held stationary in any suitable manner, for example, by being held between arms 8 pivoted at 10 on a base 12 and connected by a light coil spring 14. Stops 16 limit the movement of the arms towards each other.

A post 18 on table 12 supports an arm 20 at the angle set by set screw 22. Arm 20 has a clamp 24 which holds a tube 26 in a position extending through opening 6 into core space 4, but at a substantial angle to the radius through opening 6. The free inner end 28 of the flexible material is led out through the tube, which should be of somewhat larger internal cross-section than that of the flexible material.

The angle which the tube makes with the radius may vary considerably with different winds and different materials. I have, however, had the best results when the angle lies within the range of about 15° to 25° to the radius through the opening 6.

However, the inner end of the tube should be sloped towards that half of the package on the side of the diametral plane through the opening 6 which is wound last. As shown by arrow 30, the spindle turned counterclockwise in winding the package, and that portion of the package on the right side of the drawing is wound last; the tube is therefore slanted towards the right. Its inner end, which forms the annular guiding surface, is preferable about half way across the core space, that is, in a diameter of the core space perpendicular to the radius of opening 6.

With such guiding member, the tightening of the coil being withdrawn is progressive and the tendency to move inward is not transmitted to the succeeding coils, so that these coils do not come away from the wall and entangle one another.

In the form of Fig. 2, the package is the same except that the holes in successive layers are angularly displaced from each other by slight amounts so that the central axis of opening 6¹ forms an angle with the radius through the opening.

Package 2 is encircled by a strip 32 of flexible material, such as cloth or paper, which has a slight adhesion to the flexible material. Strip 32 is in turn engaged by the inner faces of walls 34 of a box, and has on its outer surface an adhesive which adheres more strongly to the wall of the box. This prevents turning of the package within the box, yet allows paying out of even the last (outer) layer of the flexible material. Of course, strip 32 need not be continuous around the package.

Tube 26 has thereon a flange 36 set at the proper angle thereto, and secured against the outside of the box wall

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by an adhesive piece 38. This holds the tube in position passing through the box wall and opening 61 into the core space at the proper angle.

If desired, in packaging wire or the like, the outer end 40 of the material may be brought out to the outside of the box and secured by an adhesive strip 42. The electrical continuity of the wire in the package can then be tested. Also, flange 36 may have a projection 44 extending into a hole in the wall 34 to prevent turning of the tube.

While I have shown a straight tube, the use of such a tube is not essential as long as the guiding surface is properly located with respect to the opening. Furthermore, the tube need not be rigid, but may be flexible or resilient, for example of the types shown in my application for Package of Flexible Material, Serial No. 344,871, filed March 26, 1933, executed of even date herewith.

The invention is applicable both to resilient or relatively rigid, flexible materials, such as wire, as well as to textiles such as yarn, thread, cord, or rope. However, the guiding member should have an internal cross-section at least somewhat larger than that of the flexible material so as to avoid frictional drag.

While I have described herein some embodiments of my invention, I wish it to be understood that I do not intend to limit myself thereby except within the scope of the claims hereto or hereinafter appended.

I claim:

1. A package of flexible material having an annular core space around which the material is wound in a body and an opening into such core space through the body of the package, a guide member secured in said opening through which the inner free end of the material may be drawn out, said guide having a part providing an annular guiding surface within the core space, the line connecting such surface to the opening forming an angle of about 15° to 25° with the radius of the core space through such opening and lying on the side of such radius on which the material is wound last.

2. A package as claimed in claim 1 in which the guiding member is a straight tube inclined to said radius.

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3. A package as claimed in claim 2 in which the guiding surface is located substantially in the diameter of the core space perpendicular to such radius.

4. A package as claimed in claim 3 in which the axis of the opening forms a similar angle to the radius.

5. A package as claimed in claim 4 formed of a plurality of coils each forming at least one figure 8.

6. A package as claimed in claim 1 in which the axis of the opening forms a similar angle to the radius.

7. In combination with a package as claimed in claim 1, a holder for the package having means to prevent the turning of the package therein, said holder having means engaging the guide member to hold it in position within the package.

8. In an article as claimed in claim 7, said holder comprising a box, said preventing means including material engaging the outside of the package and the inside of the box and adhering to both.

9. In an article as claimed in claim 8, the material having greater adhesion to the box than to the package.

10. A holder for a package of flexible material having an annular core space around which the material is wound in a body and an opening into such core space through the body of the package comprising means to hold the package in fixed position and means to hold a guiding member having an annular guiding surface in a position extending through such opening into the interior of the package with the annular guiding surface within the core space of the package and at such an angle that the line connecting such surface to the opening forms an angle of about 15° to 25° with the radius of the core space through such opening.

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