

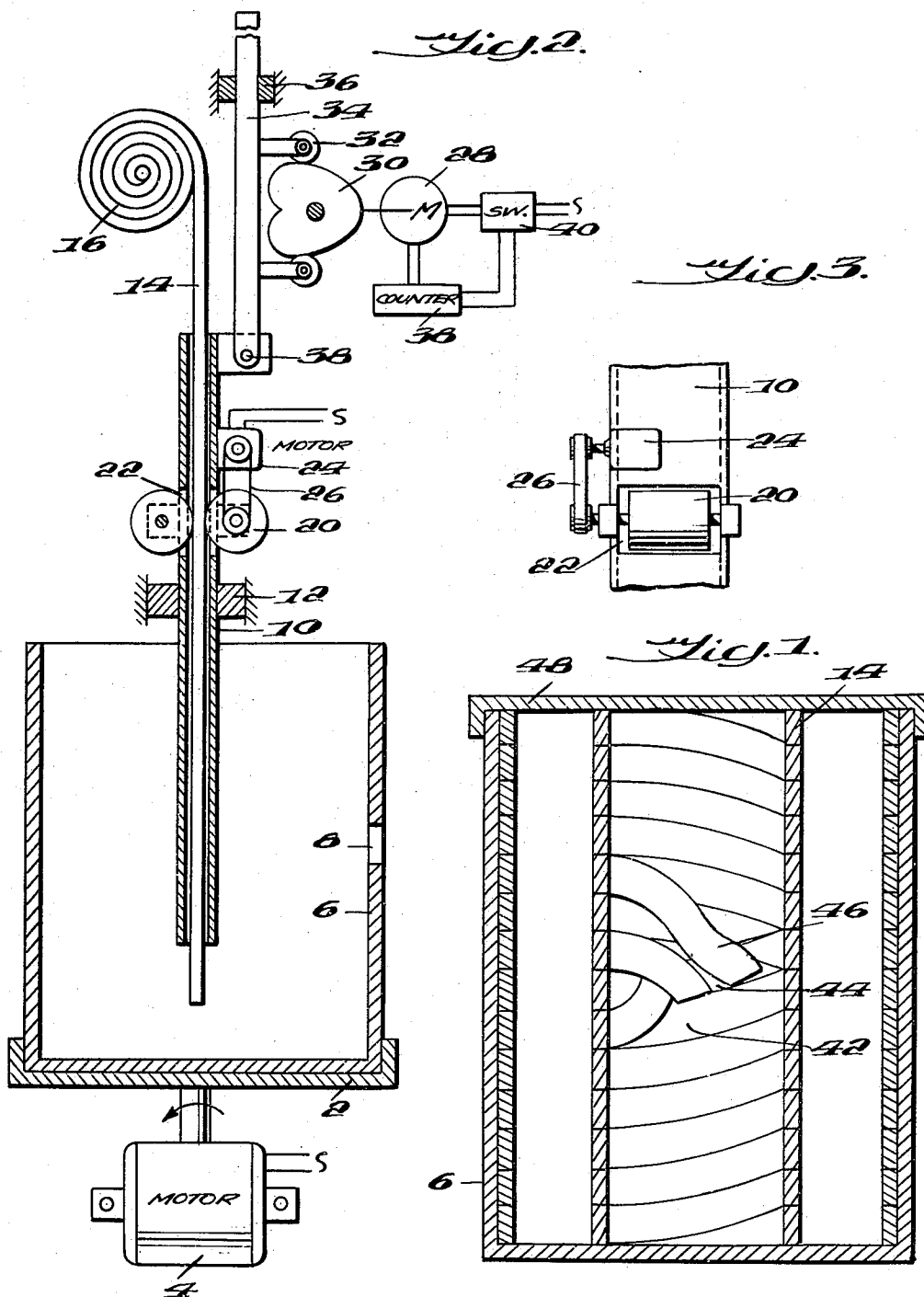
Dec. 30, 1969

W. F. GORDON

3,486,714

WINGING FLEXIBLE MATERIAL

Filed Oct. 26, 1966



INVENTOR

WILLIAM F. GORDON

BY *Bailey, Stephens & Huettig*
ATTORNEYS

1

3,486,714

WINDING FLEXIBLE MATERIAL

William F. Gordon, Brooklyn, N.Y., assignor to Windings, Inc.

Filed Oct. 26, 1966, Ser. No. 589,577

Int. Cl. B65h 55/04

U.S. Cl. 242—163

3 Claims

ABSTRACT OF THE DISCLOSURE

A package of springy material is produced within a cylindrical container by feeding the material forceably into the interior of the container through a reciprocating tube having its open end within the container. The material is laid up in the form of figure-8 bights, through which a radial opening is provided, the inner end of the material being drawn out through this radial opening.

The present invention relates to the winding of flexible material, and more particularly to the winding of packages of resilient or springy flexible material, such as resilient strip metal, wire or plastic filaments.

It is known to wind material in packages composed of layers, each of which is formed by a plurality of bights, each composed of one or more figure-8's, with or without a radial opening in the package to permit the material in the package to be drawn outwardly through the opening on the inside of the axial passage through the package, so as to prevent twist when the material is withdrawn.

Such packages have been satisfactory for use with ordinary flexible material, such as thread, wire or the like. However, for fairly springy material, such as steel strip, they present problems in avoiding the possibility of collapse or outward bulging of the package because of the resiliency.

The present invention is intended to provide a method and apparatus for winding such packages with resilient or springy flexible material, and to a package produced thereby.

The primary object of the invention is to encase a package in a container such as a drum, with the package fitting inside the drum and pressing through the resiliency of the material against the wall of the drum. Furthermore, such a package may be produced having a radial opening through the wall at one point coinciding with an opening in the drum, so that the inner end of the material wound within the drum can be drawn out therethrough, so as to avoid the build-up of twist in the withdrawn material.

The invention, in general, contemplates the feeding of a resilient flexible material into the interior of a drum by a guide reciprocating axially within the drum while the drum is being rotated in such a way as to form figure-8 bights therein. This is accomplished by feeding the flexible material into the drum at a potential rate greater than the peripheral speed of the interior of the drum while preferably providing slippage in the drive of the material, so that the material is forced into the drum and is under compression which tends to hold the various layers of the package outwardly towards the interior of the drum wall, and prevents any danger of inward collapse.

If the package is to have a radial opening therethrough, this may be accomplished as shown in Patent No. 2,634,923 by interrupting, slowing down or varying the feed of the guide periodically. This may be done either by interrupting the movement of the guide at the same point of cross-over of the bights or it may be done by causing the cross-overs to progress first in one direction

2

for slightly less than 360° and then in the other direction for slightly less than 360°, as shown in Patent No. 2,767,938.

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

FIG. 1 shown in cross-section a package embodying the invention;

FIG. 2 shows diagrammatically a machine for producing such a package; and

FIG. 3 shows a side view of a part of FIG. 2.

The machine for making such a package, that is, as shown in FIG. 2, includes a holder 2, rotated by a motor 4. In this is placed a drum 6 having an opening 8 in the wall thereof.

A flat tube 10, or other conducting member having an internal cross-section substantially equal to that of the material to be wound, is mounted for sliding movement in bearing 12 axially into and out of the container 6. A strip 14 of springy material is withdrawn from a roll 16 and passes through the tube. On the outside of the tube are brackets, which rotatably support rollers 20, which may be covered with a frictional material such as rubber. These rollers are mounted opposite windows 22 in the tube 10, and are close enough together to engage the material 14 passing through the tube. One of the rollers is driven by a motor 24 carried by the tube through, for example, a belt 26.

The tube is reciprocated by a motor 28 driving a heart-shaped cam 30 which engages rollers 32 carried by a reciprocating member 34 slidable mounted in bearing 36 and connected at 38 to the tube 10.

A counter 39 counts the revolutions of the motor 28, and at periodic intervals activates the switch 40 of the motor so as to stop the rotation thereof. This latter feature is used only if it is desired to wind a package with an opening therethrough, so as to pay out a twistless line.

The package produced is shown in FIG. 1. It includes the strip 14 of flexible material, which, because of the stopping of the motor 28 at periodic intervals which causes the strip to feed substantially circumferentially, as shown by the section 42, leaves an opening 44 in the package opposite the opening 8, through which the free inner end 46 of the material may be drawn out.

The motor 24 is driven at such a speed that it turns the rollers 20 at a greater speed than the speed at which the strip 14 is taken in by rotation of the container 6. The extra speed is permitted by the fact that the rollers are frictional or are frictionally driven, so that some slippage takes place. As a result, the material is under compression as it is laid in the can, and this compression is maintained, so that there is no tendency for the material to collapse inwardly and interfere with proper withdrawal.

It is preferable to cover the can 6 with a cover 48, if the material is to be drawn out through an opening such as 8.

In the case of springy filaments, the material may be fed in by blowing a blast of air through a suitable hose connection into the outer end portion of pipe 10.

While I have described here in 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 springy material comprising a cylindrical container and springy material wound within the container to form a series of figure-8 bights, the material being longitudinally compressed and exerting an outward resilient force against the inner wall of the container,

3

said figure-8 bights having a radial opening therethrough at one point, and said container having an opening therein opposite such radial opening, the free inner end of the material being led out through such openings.

2. A method of producing a package of springy material in a cyclindrical container comprising feeding the material into the container, producing such relative movement between the material and the container as to lay up on the interior of the container a series of figure-8 bights of the material, and maintaining said material under longitudinal compression in the direction in which it is laid during the formation of the package, in which the axial movement of the material is interrupted at one point so as to form a radial opening through the layers of the material.

3. A method as claimed in claim 2, in which said container is rotated and said material is guided in movement axially of the container from end to end thereof.

4

References Cited

UNITED STATES PATENTS

	302,362	7/1884	Sweet	242—83
	2,428,002	9/1947	Barrett	242—83 X
5	2,634,922	4/1953	Taylor	242—163
	2,634,923	4/1953	Taylor	242—163
	2,716,008	8/1955	Taylor	242—163
	2,738,145	3/1956	Taylor	242—163
	2,892,899	6/1959	Connell	242—83 X
10	2,962,756	12/1960	Biche et al.	242—83 X
	3,272,455	9/1966	Sternberg et al.	242—171

FOREIGN PATENTS

15	924,409	4/1963	Great Britain.
----	---------	--------	----------------

STANLEY N. GILREATH, Primary Examiner

U.S. Cl. X.R.

242—83, 171