United States Patent [19]

Newman

[11] **3,877,661**

[45]* **Apr. 15, 1975**

[54] **WITHDRAWAL OF FLEXIBLE MATERIAL FROM A PACKAGE WITH TWISTLESS PAYOUT**

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[*] Notice: The portion of the term of this patent subsequent to Sept. 5, 1989, has been disclaimed.

[22] Filed: **Aug. 24, 1972**

[21] Appl. No.: **283,486**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 113,319, Feb. 18, 1971, Pat. No. 3,698,005, which is a continuation-in-part of Ser. No. 819,777, April 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 810,990, March 27, 1969, abandoned.

[52] **U.S. Cl.** **242/163;** 242/131

[51] **Int. Cl.** **B65h 55/00**

[58] **Field of Search** 242/163, 129, 129.5, 130, 242/131, 131.1

[56] **References Cited**

UNITED STATES PATENTS

2,634,922	4/1953	Taylor, Jr.	242/163
2,828,092	3/1958	Taylor, Jr.	242/163
3,689,005	9/1972	Newman	242/163

Primary Examiner—Stanley N. Gilreath

[57] **ABSTRACT**

A package of flexible material formed by a plurality of layers each composed of a series of figures 8s with a radial opening through which the inner end of the material is led out of the package is dispensed by mounting it on opposed conical members which are directed towards each other inserted into the ends of the axial space within the package and withdrawing the flexible material through the radial opening.

4 Claims, 6 Drawing Figures

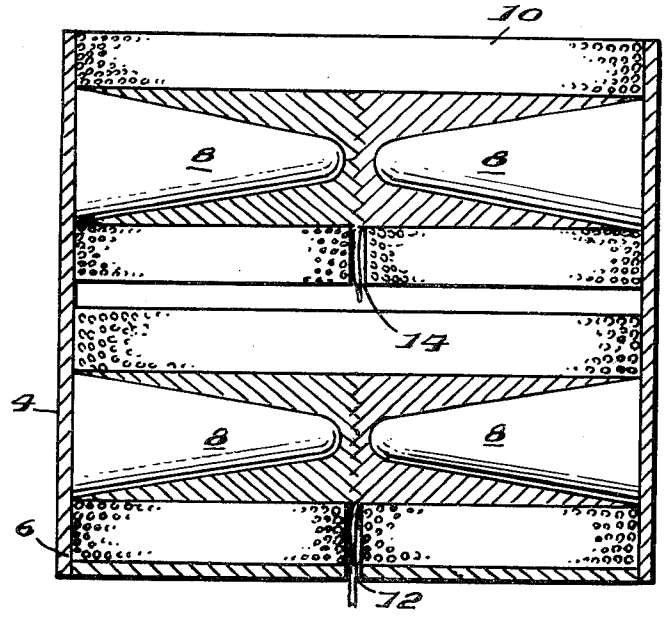


Fig. 1.

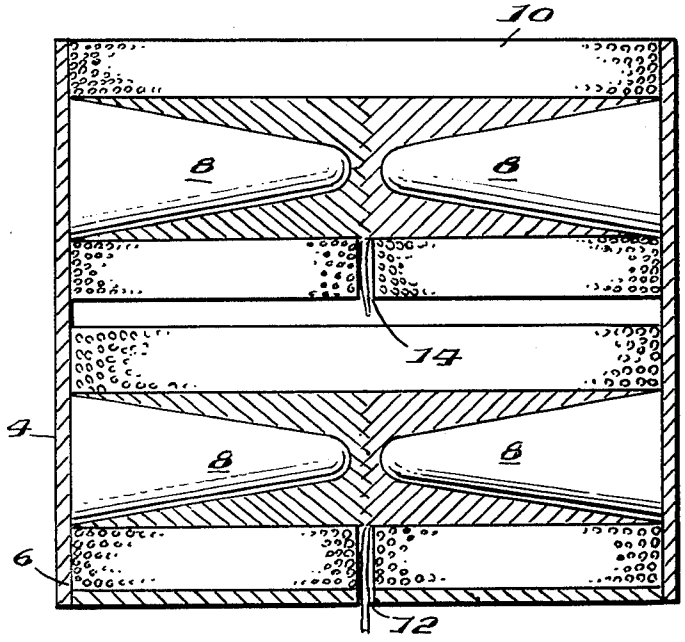


Fig. 4.

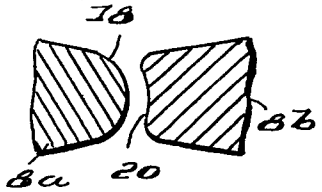


Fig. 6.

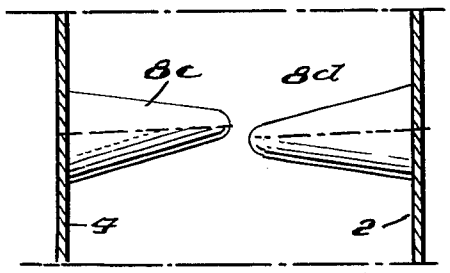


Fig. 2.

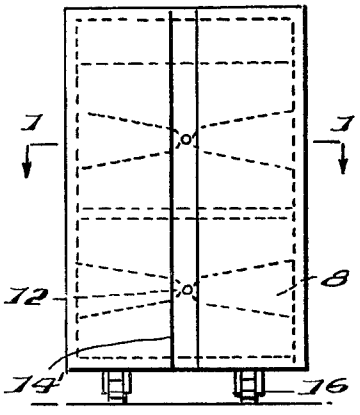


Fig. 3.

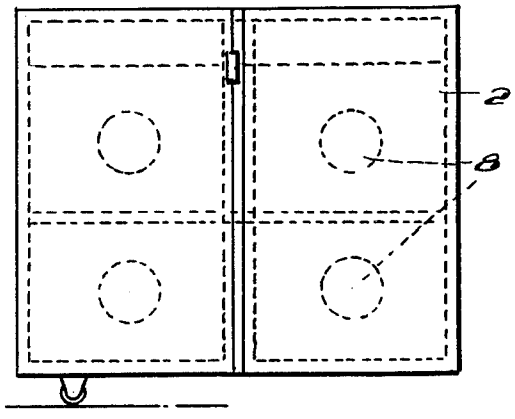
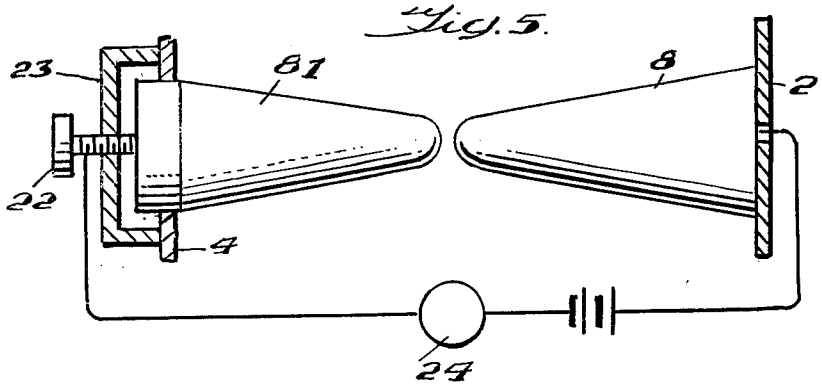


Fig. 5.



WITHDRAWAL OF FLEXIBLE MATERIAL FROM A PACKAGE WITH TWISTLESS PAYOUT

PRIOR APPLICATIONS

This application is a continuation-in-part of application Ser. No. 113,319 filed Feb. 18, 1971, now U.S. Pat. No. 3,698,005, which is in turn a continuation-in-part of application Ser. No. 819,777 filed Apr. 28, 1969, now abandoned, which is in turn a continuation-in-part of application Ser. No. 810,990, filed Mar. 27, 1969 now abandoned.

The claims of application Ser. No. 113,319 are directed to a package of flexible material having conical inserts into the ends which guide the material during its withdrawal from the package. The present application is directed to stands of the type shown in FIGS. 5–8 of application Ser. No. 113,319, and to the method of withdrawal of flexible material from the package utilizing such a stand.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a stand for supporting a package of flexible material during the withdrawal thereof through a radial opening in the package and to the method of withdrawing the material from such a package.

2. The Prior Art

Taylor U.S. Pat. No. 2,767,938 shows a package of flexible material formed of layers each composed of a plurality of figure 8s, with the free inner end of the material led out through a radial opening.

Taylor patent no. 2,828,092 shows such a package in which the inner surfaces of the end portions of the internal surface of the axial opening are frusto-conical and are supported during handling by short conical members extending partly into the package. These cones are held in place by the material of the package.

SUMMARY OF THE INVENTION

Packages of the type shown in the Taylor patents referred to have proven satisfactory for twistless payouts at low speeds. However, at high speeds there appears to be no way to insure that in the course of a payout of substantial yardage from such packages, a working loop will not half-hitch a loose loop before the payout through the hole is effected. This results in interferences with a smooth payout of the material, and may stop it altogether.

It is an object of the present invention to provide an arrangement which greatly improves the payout from packages of this type at high speeds.

Furthermore, since the wind itself pays out from an air core through a radial hole in twistless form, and this type of payout is essential to the package, and since there is a limit to the size of a package in which the last coils paid out will sustain themselves even with the addition of applied chemicals that are not adhesives, there is a premium on being able to cascade packages in a continuous manner. This requires splicing for wires, rope and certain types of yarn, requires knots for certain other types of yarn, and for still other types of yarn requires special joining procedures that are chemical in nature.

It is a further object of the invention, therefore, to provide a system for cascading packages of this type

with which rapid payout of long lengths of flexible material is possible.

It has been found that conical inserts into the ends of the air core which almost meet one another or meet one another with separate contact opposite the position of the radial hole and which perform a function which prevents the half-hitch from forming and yet does not provide significant resistance to payout if the surfaces of the cones are smooth at all points.

Basically, the arrangement of the present application contemplates the support of one or more packages of the type shown in the Taylor patents heretofore referred to to assist in the smooth payout, this consisting of two facing cones mounted on stationary walls and extending into the interior of the axial opening within the package. The cones extend at least substantially up to the transverse mid-plane of the package, and preferably the distance between the apices of each of the tapering members (as projected) and the base thereof is substantially at least as great as the distance between the base and the transverse mid-plane of the package.

Since the ultimate objective is to secure packaging that will provide for high-speed, long-length payout in convenient winding sizes and handleable packages that are in effect shipping containers, a pay-off dolly can be arranged that will house one or two rows of coils of six dispensing packages each containing in turn six coils. Each of these would be connected by joining of the ends in the most appropriate manner. To this dolly might be attached permanent cones on hinged doors that could be opened and closed; being opened when the dolly is not being used or when packages are being inserted into the dolly. Cones can also be connected to a source of electrical energy which would reflect when they touch inside the package so that each cone could be adjusted slightly to provide the optimum space between the cone points for payout purposes. Each cone can have a knob or an adjusting attachment that would enable it to be screwed out or in to get to the optimum position. Each coil will be connected to the next coil by joining and each of the series of six will be joined together. The dolly has pulleys top and bottom to transfer the line from package to package. This conical arrangement will replace cones built into the packages themselves.

According to a further feature of the invention, the cones mounted on the walls are not right cones, but have their axes forming slight angles with the longitudinal center line of the package, with the ends not being opposite each other.

According to another feature of the invention, one of the cones is rounded and the other has a recess in its tip opposite the rounded end.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 shows an arrangement for supporting a package of flexible material of the type described with a package mounted thereon, in cross-section on the line 1—1 of FIG. 2;

FIG. 2 shows an end view of a dolly for holding a plurality of packages;

FIG. 3 is a side view of the dolly;

FIG. 4 is a cross-section through a portion of a modified form of package holding dolly;

FIGS. 5 and 6 show modifications of the supporting cones.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. **1**, the package **2** is formed of flexible material, such as wire, thread, yarn, tape or other material of any cross-section formed, for example, in the manner shown in one of the Taylor U.S. Pat. Nos. 2,634,922 and 2,767,938. Such a package is constituted by a plurality of layers of figure-8 coils, the cross-overs of which progress around the package. By interruption of the cross-overs or in some other suitable way the package is provided with a radial opening **4** into the central axial opening **6**. The free inner end **8** of the material is led out through this radial opening.

Referring to FIG. **1**, there is shown a part of a casing composed of a back wall **2** and a removable front wall **4** which may for example be hinged at **6**. The back wall and the door each carry cones **8** or other tapering members which point towards each other. The cones extend substantially up to the center line of the container, and serve to support packages **10** of flexible material wound in the manner described in the Taylor patents referred to above. The space between the tips of the cones is preferably only slightly greater than the diameter of the flexible material, and generally at most four times as great. Apices of the tapering members, projected, are at least as far from the walls **2** and **4** (bases of the cones) as the distance from the walls to the mid-plane of the package. The cones preferably have rounded ends.

The cones act to guide the loops as they are pulled off from the inner wall of the package and prevent them from entangling with each other and creating a snarl.

The packages are intended to be cascaded, the material being withdrawn from the lower package through opening **12** until that package is exhausted, whereafter by a connection shown at **14** to the outside of the first package the second package can be withdrawn.

This arrangement is preferably embodied in a dolly, which has a slot **14'** exposing the holes **12**. The dolly is mounted on wheels **16** for convenience in transportation. It may of course contain many more units than are shown in the drawing.

Referring now to FIG. **4**, one of the cones **8***a* has a rounded end **18**, while the tip of the other cone **8***b* has a recess therein. This means that the cones may be rounded off and maintained quite close to or even overlapping each other without danger of actual contact if one of them is displaced slightly towards the other.

FIG. **5** shows an arrangement in which one of the cones **8** is mounted on the wall, such as wall **2**, while the other one **8'** is mounted on wall **4** by a screw **22**, secured to the cone, which is threaded in bracket **23**. The screw is connected through alarm **24** and a source of current to the cone. The cone **8'** has a cylindrical outer end portion slidable in a hole in wall **4**. The cones are made of metal. It is thus possible to adjust one cone to the other by screw **22** until contact is made, which it is indicated by the alarm, after which this cone can be backed off by a small distance by a predetermined turning of the screw.

In the arrangement as shown in FIG. **6**, the axes of the cones **8***c*, **8***d* are non-coincident so that their ends can even overlap in a vertical direction without making contact.

I claim:

1. A stand for mounting a universal wind package of flexible material having an unobstructed axial opening and a radial opening extending from the periphery of the package to the axial opening through which the inner end of the material is drawn out comprising opposed tapering members terminating at a short distance from each other, said tapering members supporting the package of flexible material the stand having walls supporting said tapering members and the distance from each wall to the apex of the tapering member carried thereby being at least substantially as great as the distance from each wall to the mid-plane of the stand.

2. A stand as claimed in claim **1**, in which the free end of one of the tapering members is rounded and the free end of the other tapering member has a recess therein.

3. A stand as claimed in claim **1**, in which the axes of the tapering members are non-coincident.

4. A stand as claimed in claim **1** having a plurality of pairs of tapering members with parallel axes mounted on said walls.

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