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TAPE PACKAGE HAVING CONTROLLED UNWINDING

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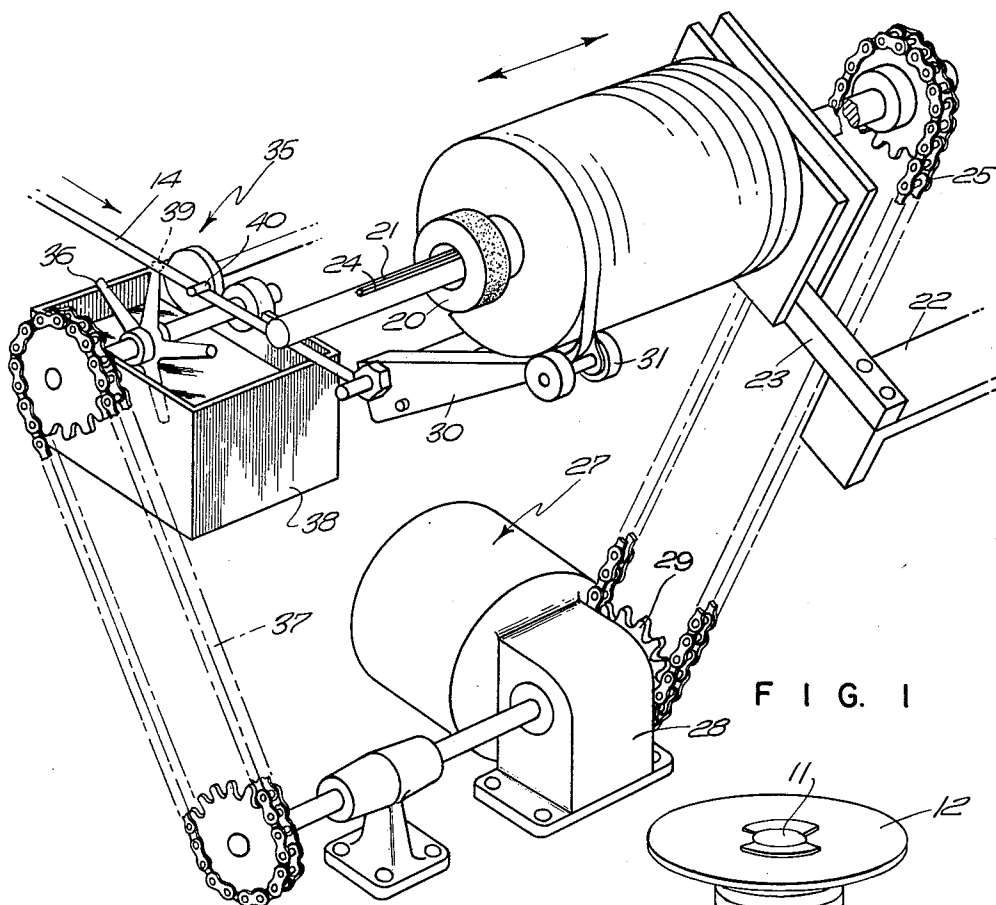


FIG. 1

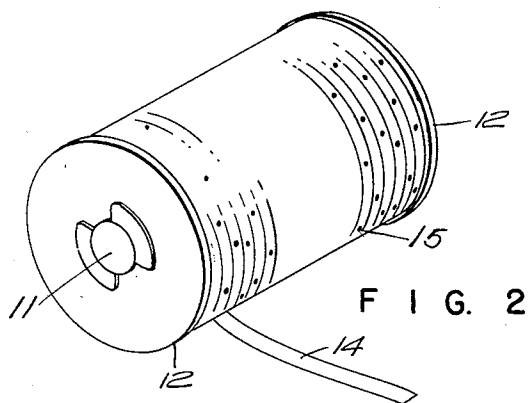


FIG. 2

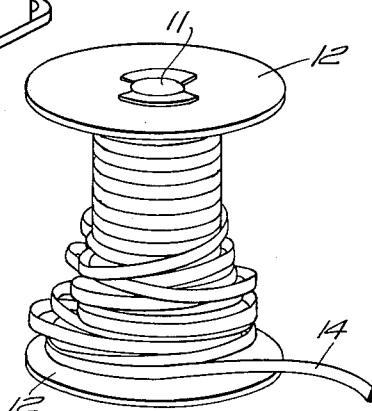


FIG. 3

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TAPE PACKAGE HAVING CONTROLLED UNWINDING

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1 Claim. (Cl. 206—59)

This invention relates to a tape reel or package of wound layers of tape and has for its object the provision of an improved method of making a tape reel.

Tapes which may take a variety of forms may be composed of a material which has little surface adhesion. For contrast purposes, if one were to consider a cotton fiber tape, it will be apparent that there are several fibers projecting therefrom which interlock so that juxtaposed tape convolutions would cling together and thus present some natural resistance to unwinding. On the other hand, tapes made from artificial fibers and paper offer but little adhesion at the surface to adjacent tape convolutions. Also if the tape is a paper tape with a reinforcing wire sandwiched between two layers, the reinforcing wire will have a certain resiliency and permanent set which will tend to open up the convolutions. Consequently, when it is desired to dispense tape from such a reel wound with the aforementioned materials, the reel will tend to spin after a demand for the tape has been abruptly stopped and will cause spilling, unwinding, tangling and similar results which interfere with subsequent dispensing operations. Generally to cope with this problem the reel ends have been made of a size much larger than the diameter of a completely wound core so that at least spilling off the end of the reel is prevented when dealing with a full package. In addition, certain frictional drags have been placed on the reel to prevent overrunning thereof and, as will be appreciated, all of the above and other efforts that have been made may generally be said to necessitate special adaptations in order to properly dispense tape. It will be further apparent that by utilizing a large reel end, the size of a finished reel is greater than it need be. This gives rise to storage problems where cubage is always at a premium.

It is accordingly an object of the present invention to provide a tape reel package which will unwind under controlled restraint.

Another object of the invention is to provide a method for winding tape packages in order to produce the controlled restrained unwinding.

A more specific object of the invention is to provide a tape package in which the surface of the tape has been spot coated with an adhesive.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claim.

In the accompanying drawings:

FIGURE 1 is a diagrammatic view illustrating generally the method of winding tape on a reel to secure the desired result of controlled unwinding;

FIGURE 2 is a perspective view of a completed reel illustrating the adhesively spotted tape; and

FIGURE 3 is a perspective view of a tape reel not treated in accordance with this invention showing the undesirable result.

In proceeding with this invention, a tape is employed which may have any of the aforementioned slippery characteristics, and I wind this tape on a reel core by utilizing repeated traverses of the tape from one end of the core to the other and coat the tape as it is applied to the reel with an adhesive material which preferably has the property of quick drying. In this winding process the

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presence of the adhesive will cause the juxtaposed layers to adhere one to the other. There is of course a considerable latitude in the area of adhesion, but it has been found that by utilizing spot applications of adhesive spaced lineally so as to be present at each successive or up to each fifth successive convolution, satisfactory results will be obtained. Such adhesive applications provide a resistance to the unwinding pull of a slight degree and yet permit substantially free unwinding under normal unwinding tensions.

Referring now to the drawings, the tape reel usually comprises a hollow cylindrical core 11 made of any suitable material which has disk shaped ends affixed thereto so as to form spool ends. It is sometimes preferred to wind the tape material on the core 11 before the ends 12 are applied, and in accordance with standard practice tape 14 is wound on the core by employing a traverse mechanism so that the tape will lie adjacent to a previously wound circumference from one side of the core to the other.

In accordance with the general concept of this invention, adhesive spots such as 15 are applied to the face of the tape 14, and these adhesive portions may be spaced any suitable distance one from the other. Basically, the adhesive may take a variety of forms. For instance, it may be a water soluble type such as a water and animal glue or an emulsion type such as an emulsion of polyvinylchloride acetate or an emulsion of polyvinyl acetate or of a hot melt type or of a solvent type. The main constituents or physical properties which the adhesive should have to be successful is that when hardened, it be somewhat brittle and that after application it dry extremely fast to a tacky surface.

To accomplish such spooling as generally defined above may be practiced in accordance with the schematic representation as in FIGURE 1. Here the core 11 is mounted on a core holder 20 which is in turn slidably mounted on an arbor 21. The core holder 20 is attached to a traversing mechanism not shown which has an actuating bar 22 extending therefrom and an arm 23 extending into engagement with the mounting device 20. In this fashion the device 20 is reciprocated on the arbor 21 in accordance with a predetermined and timed pattern. Drive engagement between the core mounter 20 and the arbor 21 is had via a keyway 24, and actual rotary motion is imparted through this arbor by a chain drive such as 25 coming from a source of power generally indicated at 27 and including a gear reduction unit such as 28 having a sprocket gear 29 affixed thereto for engagement with the chain 25.

The tape 14 is led over suitable guide means into a guide trough 30 which is fixedly mounted for rocking action on an axis parallel to the arbor 21. This trough merely serves as a guide for the tape and has affixed on the ends thereof two rollers 31 to maintain the end of the trough spaced from the actual surface of the spool as it is being wound. Before the tape reaches the guide means 30, it passes through an adhesive applying station that is generally indicated 35. This station consists of a star wheel 36 rotated through suitable mechanical drive arrangement 37 from the gear reduction unit 28. The star wheel 36 is mounted in proximity and over a supply of adhesive such as in a container 38. The supply level in the container 38 is such that the tip of the star wheel will pick up a small quantity of adhesive, and the tape is guided at a level relative to the tip of the star wheel 36 so that contact is made as at a point 39, the tape being prevented from moving upward by a guide means such as 40. In this fashion as each tip of the star wheel engages the tape, a spot of adhesive will be applied to the surface of the tape which will remain exposed on the spool. It will be apparent that the speed of the star

wheel 36 may be varied within limits and thus control the frequency with which the adhesive is applied to the surface of the tape. As the tape is wound on the spool, the rollers 31 on the guide 30 maintain the guide spaced from the previous layers that have been wound with adhesive thereon and prevent the further spreading of the adhesive beyond the spot application. Should perchance some adhesive be picked up on the rollers 31, this will not be detrimental as it will be in spot formation rather than in a continuous application.

From the foregoing it will be appreciated that many desirable results flow. As illustrated in FIGURE 3 of the drawings, a package not treated in accordance with this invention results in tangling of tape convolutions as the tape sloughs from the package. This is particularly true when a wire reinforced tape is wound, the wire having a natural tendency to return to straight form and unwind as in a spiral. A treated tape package may, however, be wound with more tension to create a tighter or denser package and thus for a given diameter more tape length may be contained. Further, the spool ends need be only equal to the tape package diameter as sloughing is completely prevented, the enlarged spool ends being

previously used to contain the tape within the bounds of the reel core on unwinding.

I claim:

A tape package comprising a core, a two-faced tape wound thereon in a plurality of layers with one layer superimposed on another radially outwardly of the core, each layer having the tape thereof helically disposed at a substantially uniform pitch from one end of the package to the other, the tape of one layer being breakably adhered to the tape of the next layer at a plurality of spaced spot locations throughout the length of the tape, whereby the layers of tape are breakably secured together and are retarded from sloughing off the package.

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