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PRESSURE SEALING PAPER TAPE

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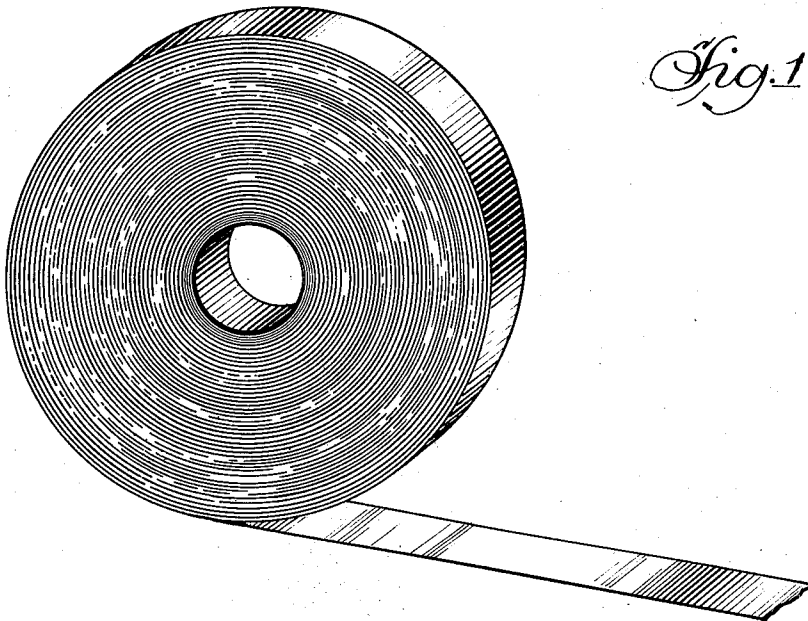


Fig. 1

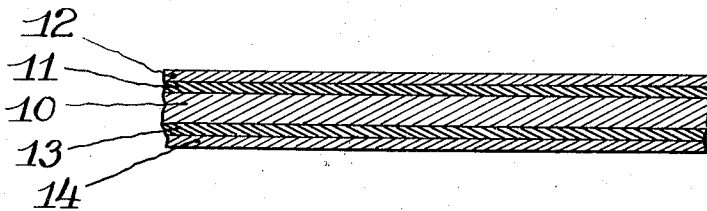


Fig. 2

Witness
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UNITED STATES PATENT OFFICE

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PRESSURE SEALING PAPER TAPE

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Application March 26, 1942, Serial No. 436,221

8 Claims. (Cl. 117—68.5)

This invention relates to a paper tape and more particularly to a pressure sealing paper tape.

An object of the present invention is to provide a pressure sealing paper tape which is water and vapor proof.

It is a further object of my invention to provide a paper tape which is resistant to most solvents such as gasoline, naphtha, benzol, and corrosive substances such as alkali solutions, concentrated acetic acid, dilute nitric and dilute hydrochloric acids, etc., and which is fast sealing and adheres aggressively to paper, metals and other surfaces.

The advantages of such a self-sealing water and vapor proof paper tape are tremendous because of the many fields of its application in use. Many repeated attempts have been made for more than the past twenty years, and a large amount of time and money expended to produce such a tape but without success.

The above and other features, advantages, capabilities will become apparent from a detailed description of the accompanying drawing in which I have illustrated one form of my paper tape structure but the structure there shown is to be understood as illustrative only and not as defining the limits of my invention. It is of course understood that tapes, as initially manufactured are wound in convolute rolls or if cut in sheets, the sheets are superimposed and when desired to use, the roll must be unwound or the sheets separated. It is also generally known that in the tapes heretofore on the market, particularly paper tape, that if when the roll becomes soaked with moisture, as frequently happens in the different places or under the different conditions in which such tapes are used, the unused portion of the roll is rendered worthless, as it is impossible to separate or unwind the roll. However, with my invention it affords a paper tape which will solve this problem, for with my improved paper tape, even though it may become soaked for a long time in water it can be readily and quickly dried and used as initially intended, as all of its initial characteristics, notwithstanding it has thus been soaked in water or moisture, are automatically re-established to the fullest extent by merely drying the tape.

Referring to the drawing:

Fig. 1 is a perspective of a roll of tape embodying the invention; and

Fig. 2 is a longitudinal sectional enlarged view of the finished tape.

Referring to the drawing in detail, in the preferred form my composite paper tape is com-

posed of five separate and distinct layers, laminations or sections. The base 10 consists of any suitable paper on the market such as kraft, rag, glassine or parchment, the particular type of paper being determined to some extent by the use for which the completed tape is intended. For example, if great strength is required a relatively heavy long fibred stock is utilized. To one side of the paper base I apply directly a separator 11. One of the important functions of this separator is to lay the fibres of the craft paper, which generally extend outward from the surface in the form of fuzz discernible to the naked eye, with a sufficient separator in order that no portion or part of the adhesive 12, which is subsequently imposed upon the separator will touch or come in contact with the paper. The reason for this is that I have found from long experiments and study that should the paper or any of the fibres thereof come in contact with an adhesive, the impurities in the various papers on the market, for example, traces of metal, tend to break down certain types of adhesive by catalytic action, as shown by my experiments.

The separator 11 comprises lacquers composed of cellulosic derivatives such as nitrocellulose, ethyl cellulose, etc. It may also comprise varnishes comprised of oleo-resinous materials, synthetic resins such as Vinylite, methacrylate, alkyds, etc. This separator in addition to laying the fibres flat, also impregnates the paper rendering it moisture and vapor proof.

After the separator above described has been applied to one side of the craft paper, lamination or section, I apply to the opposite side of the paper a repellent primer 13 in the form of a continuous film which must be very smooth and glossy and capable of bonding the repellent to it. While my experiments have shown that the same substances suitable for use as a separator may also be used as a suitable repellent primer, I prefer to use a resilient primer with a very high glossy finish. Varnishes, alkyds, and lacquers high in oil content afford the desired or preferred coating. The repellent primer is preferably less than 1-mil thick. One reason for restricting the repellent primer coating to such thinness is to permit the air bubbles to be removed or taken out during the subsequent drying operation presently to be described.

To the repellent primer coating I next apply directly thereto a repellent coating or lamination 14. This repellent coating or lamination preferably consists of 4 parts of an incompletely hydrolyzed, polyvinyl acetate sold under the trade

name "Solvar 405," and 6 parts of a sodium sulfonate of an oleic acid ester of an aliphatic compound sold under the trade name "Igepon AP." However, any of the repellents exemplified in my copending application Serial No. 421,927, filed December 6, 1941, may be utilized. I further apply on and directly to the surface of the separator a coating or lamination 12 of pressure sealing adhesive. This lamination of adhesive preferably consists of 4 parts of polymerized isobutylene having an average molecular weight of 50,000 sold under the trade name "Vistanex," 1 part of milled crepe and 5 parts of soft hydrogenated terpene resin. However, other suitable pressure sealing adhesives as disclosed in the above mentioned copending application may be utilized.

If the separator is composed of water-proof substances such as styrene, polystyrene, or water-proof varnishes, the composed tape is rendered water-proof. However, if gasoline proof tape is desired, then polystyrene would not be satisfactory but a separator of vinyl chloride-vinyl acetate resin would be satisfactory as I have found from my experimentations. When it is desired to produce a paper tape resistant to both water and gasoline then I have found from my experiments that two different substances can be used, one as a separator and another as a repellent primer. I have also found from experimentations that where a tape is desired which is resistant to both water and gasoline that vinyl chloride-vinyl acetate resin and/or varnish on both sides of the paper craft would be satisfactory.

In the process of manufacture, after the separator lamination has been applied to one side of the paper craft and the repellent primer to the other, the next step is to apply the repellent directly to the repellent primer coating. After the repellent is applied directly to the repellent primer coating the tape is passed through a drier and the repellent properly dried. Thereafter in consecutive order the adhesive is applied on the separator coating or lamination and the structure is again passed through a drier for drying operating or drying the adhesive and removing the solvent therefrom. In other words there are two separate and consecutive coating and drying operations. As the structure is passed through the drying operations, the solvent is removed. During each drying operation there is a temperature maintained ranging progressively from 120° F. to 275° F. during which operation all the solvent is removed from the adhesive and the repellent.

The pressure sealing adhesive lamination which I have heretofore exemplified maintains its pressure self-sealing capacity or characteristics over very long periods of time, indeed, we might say permanently for all intents and purposes, and by providing the separator between the adhesive and the paper base all likelihood of the adhesive being broken down or its intended functions impaired by impurities in the paper setting up a catalytic action is entirely overcome.

Having thus described my invention, I claim:

1. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a water and moisture proof separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape.

2. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape.

3. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a plastic separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape.

4. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a plastic separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, the material of said separator layer being impregnated in said paper tape, and said separator layer serving to prevent the adhesive composition from contacting the paper tape.

5. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a plastic separator layer, a base comprising a paper tape, a relatively thin, glossy surfaced plastic repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape.

6. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer, a plastic separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape, said adhesive composition comprising polymerized, isobutylene of a relatively high average weight, natural crepe rubber and soft hydrogenated terpene resin, and said repellent comprising an incompletely hydrolyzed polyvinyl acetate and a sodium sulfonate of an oleic acid ester of an aliphatic compound.

7. A pressure sealing adhesive tape comprising five layers of material firmly secured together, including in order a pressure sealing adhesive layer comprising polymerized isobutylene of a relatively high average weight, natural crepe rubber and soft hydrogenated terpene resin, a plastic separator layer comprising vinyl chloride-vinyl acetate resin, a base comprising a paper tape impregnated with the material of said separator layer, a repellent primer layer comprising said vinyl chloride-vinyl acetate resin and a layer of material repellent to said pressure sealing adhesive comprising an incompletely hydrolyzed polyvinyl acetate and a sodium sulfonate of an oleic acid ester of an aliphatic compound, said separator layer serving to prevent the adhesive composition from contacting the paper tape and said vinyl chloride-vinyl acetate resin material serving to give the tape resistance to water, gasoline and the like.

8. A pressure sealing adhesive tape comprising five layers of material firmly secured together,

including in order a pressure sealing adhesive layer, a plastic separator layer, a base comprising a paper tape, a repellent primer layer and a layer of material repellent to said pressure sealing adhesive, said separator layer serving to prevent the adhesive composition from contacting the paper tape, said adhesive composition comprising four parts of polymerized isobutylene having an average molecular weight of 50,000 sold under

the trade name "Vistanex," one part of milled crepe and five parts of soft hydrogenated terpene resin, and said repellent comprising four parts of an incompletely hydrolyzed polyvinyl acetate sold under the trade name "Solvar 405" and six parts of a sodium sulfonate of an oleic acid ester of an aliphatic compound sold under the trade name "Igepon AP."

GUSTAVE SCHIEMAN.

CERTIFICATE OF CORRECTION.

Patent No. 2,358,831.

September 26, 1944.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 42, for the word "resilient" read --repellent--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of January, A. D. 1945.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.