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REPELLANT ROLL FOR HANDLING ADHESIVE SHEETS

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Fig. 1

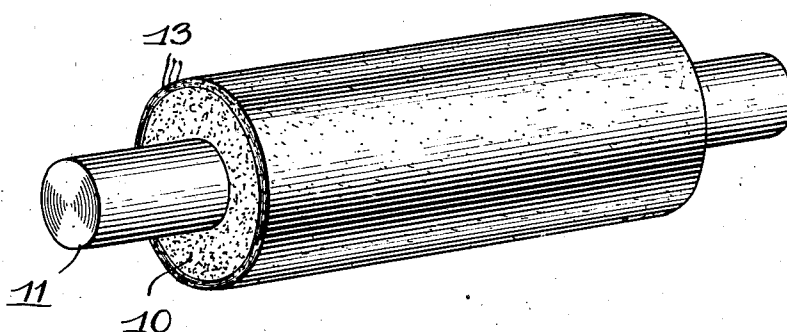
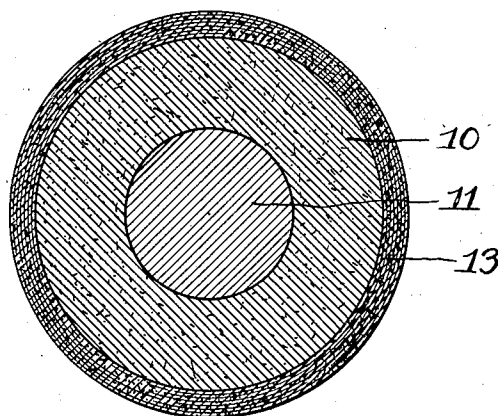


Fig. 2



Witness:
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UNITED STATES PATENT OFFICE

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REPELLENT ROLL FOR HANDLING
ADHESIVE SHEETS

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9 Claims. (Cl. 164—60)

The object of my invention is to provide a repellent roller for use in slitting pressure sensitive or pressure sealing adhesive sheets into narrow strips or tape.

Pressure sealing adhesive sheets, that is, sheets provided with a pressure sealing or pressure sensitive adhesive on one side and a coating on the opposite side repellent to said adhesive (when the surfaces contact in package or roll form), such for example as described in my copending application Serial No. 421,927, filed December 6, 1941, are initially manufactured in sheets of substantial width, ordinarily thirty inches in width. Thereafter, these sheets are slit by means of a well-known slitting machine into strips of narrow width to form narrow strips of tape. In the slitting machines heretofore known and attempted to be used, the sheet passes over a roller having a high polished surface such as polished metal. In utilizing such rollers the sheet adheres strongly to such roll or rollers, thus greatly interfering with the slitting operation and resulting in spoilage and interruptions of the operation of the slitting machine. Therefore it is an object of my invention to provide a roller for such slitting machine having a surface to which such sheets or material will not adhere.

Many substances have been tried over long experimentation, such as rubber, glue, glycerine, copper, nickel, chromium plated steel, and other kinds of polished metal, etc., but none of these were satisfactory. Finally I solved the problem by providing a roll made of materials which will absorb a suitable repellent in copious quantities and by successively building up on such roller laminations of such repellent, thus preventing the adhesive sheet from sticking or adhering to the roller.

The above and other advantages and capabilities will become apparent from a detailed description of the accompanying drawing illustrating one form of my invention but the construction there shown is to be understood as illustrative only and not as defining the limits of my invention except insofar as specified in the appended claims.

In the drawing:

Fig. 1 is a perspective view of the repellent roller embodying my invention, and

Fig. 2 is a transverse sectional view thereof.

Referring to the drawing in detail, the body of the roller 10 is made of material which has the capacity to absorb a suitable repellent in copious quantities such for example as the repellent described in my copending application above men-

tioned. This roller is fixed on a shaft 11 by means of which shaft it is adapted to be rotatably mounted in a suitable slitting machine. In actual operation it is placed adjacent to and co-operates with the well known rotating knives ordinarily used in such machines.

As a result of my experiments I have obtained excellent results by utilizing a roller 10 of soapstone (an impure form of steatite or talc $(3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O})$). This structure inherently possesses satisfactory slip properties and at the same time is sufficiently porous to absorb a suitable repellent in copious quantities. The roll 10 is coated with a shell 13 comprising a plurality of laminations of suitable repellent successively applied. In applying the repellent to this soapstone roll I find that I have obtained excellent results by the following method.

First the soapstone roll is placed in a bath of about a six percent solution of 50% of an incompletely hydrolyzed polyvinyl acetate sold under the trade name "Solvar 405" and 50% of a sodium sulfonate of an oleic acid-ester of an aliphatic compound sold under the trade name "Igepon AP," in water, containing about 10% of a mixture of 100 parts of specially denatured alcohol No. 1, 5 parts of ethyl acetate and 1 part of aviation gasoline (all parts by volume) sold under the trade name "Solox," for about two hours. This is done to fill up all the pores of the soapstone.

Second, the roll is then removed and dried at a temperature on the order of 220° F. for about twenty minutes.

Third, in order to deposit a thin film of the repellent such as heretofore alluded to, the roll is soaked in about an 18% solution of the bath described in step one and wiped clean.

Fourth, the roll is then removed and dried at a temperature on the order of about 220° F. for about twenty minutes.

Fifth, I then repeat step number three;

Sixth, I then repeat step number two;

Seventh, I then repeat step number three;

Eighth, I then repeat step number two;

Ninth, the roll is then wiped with a 30% solution of the bath described in step number one;

Tenth, I then repeat step number two;

Eleventh, I then repeat step number nine;

Twelfth, I then repeat step number two;

Thirteenth, I then dry the roll in the air, and Fourteenth, I then turn the roll down to a smooth finish on a suitable lathe.

After so forming such roll and operating it in any of the well known slitting machines, I found

that its surface repels the adhesive sheets or tape with entire satisfaction, certainly to the same extent as the repellent coating on the adhesive sheets.

During long use of the roll after being so formed, it is found that the repellency of the roll may be lessened. In order to bring back its repellency to its full extent it is not necessary to go through all the steps above described, but it is only necessary to treat the roll described in steps three, two, three, two, that is, dip the roll into an 18% solution of the repellent, wipe it clean and dry for the specified time and repeat.

While I have specifically mentioned soapstone, I do not wish to be limited to that particular material, as other suitable material having the capacity to sufficiently absorb the repellent in copious quantities may be utilized.

Having thus described the invention, I claim:

1. A repellent roll adapted for use in a slitting machine for slitting pressure sealing and pressure sensitive sheets and tape, comprising a base of soapstone carrying a smooth finish surface layer of material repellent to pressure sealing and pressure sensitive adhesives.

2. A repellent roll adapted for use in a slitting machine for slitting pressure sealing and pressure sensitive sheets and tape, comprising a base of rigid material carrying a surface layer of material repellent to pressure sensitive and pressure sealing adhesives, said rigid material being sufficiently porous to absorb said repellent material solution in copious quantities.

3. A method of forming a repellent roll adapted for use in slitting machines for slitting pressure sealing and pressure sensitive sheets and tape, comprising the steps of first treating a roll comprising a body portion formed of soapstone and the like with a bath formed of an about 6% solution of a mixture of equal parts of an incompletely hydrolyzed polyvinyl acetate sold under the trade name "Solvar 405" and a sodium sulfonate of an oleic acid ester of an aliphatic compound sold under the trade name "Igepon AP" in water containing about 10% of a mixture of 100 parts of specially denatured alcohol No. 1 with 5 parts of ethyl acetate and 1 part of aviation gasoline (the parts being by volume) sold under the trade name "Solox," for about two hours, then removing said roll from said bath and drying it at about 220° F. for about 20 minutes and thereafter until the desired thickness of coating is obtained, repeating alternately the two steps of soaking said roll in a bath formed of an about 18% solution of said mixture of equal parts of "Solvar 405" and "Igepon AP" in water containing about 10% of said "Solox" and drying at about 220° F. for about 20 minutes after removing the roll from said bath.

4. A repellent roll adapted for use in a slitting machine for slitting pressure sealing and pressure sensitive sheets and tape, comprising a base of soapstone having impregnated therein and coated thereon in the form of a smooth finish surface

layer, material repellent to pressure sealing and pressure sensitive adhesives.

5. A repellent roll adapted for use in a slitting machine for slitting pressure sealing and pressure sensitive sheets and tape, comprising a base of rigid material having impregnated therein and coated thereon in the form of a surface layer, material repellent to pressure sensitive and pressure sealing adhesives, said rigid material being sufficiently porous to absorb said repellent material solution in copious quantities.

6. A repellent roll adapted for use in a slitting machine for slitting pressure sealing and pressure sensitive sheets and tape, comprising a base of soapstone carrying a smooth finish surface layer of material repellent to pressure sealing and pressure sensitive adhesives, said repellent material comprising approximately equal parts of an incompletely hydrolyzed polyvinyl acetate sold under the trade name "Solvar 405" and a sodium sulfonate of an oleic acid ester of an aliphatic compound sold under the trade name "Igepon AP."

7. A method of forming a repellent roll adapted for use in slitting machines for slitting pressure sealing and pressure sensitive sheets and tape, comprising the steps of first treating a roll comprising a body portion formed of soapstone and the like with a bath formed of a solution of material repellent to pressure sealing and pressure sensitive adhesives to impregnate and coat said roll with said repellent material, then removing said roll from said bath and drying the same at elevated temperature and thereafter until the desired coating is applied repeating alternately the two steps of soaking said roll in a solution of said repellent material to form a coating of said repellent material on the roll and drying said roll after removal from said treating bath.

8. A method of improving the repellent properties of a repellent roll adapted for use in slitting machines for slitting pressure sealing and pressure sensitive sheets and tape, which comprises alternately treating said roll with a bath formed of a solution of a material repellent to pressure sensitive and pressure sealing adhesives to form a coating of said repellent on said roll and drying said roll after removing the same from said bath until the dried roll has the desired thickness of repellent material thereon.

9. A method of forming a repellent roll adapted for use in slitting machines for slitting pressure sealing and pressure sensitive sheets and tape, comprising the steps of alternately treating a roll comprising a body portion formed of a rigid material with a solution of material repellent to pressure sealing and pressure sensitive adhesives, and drying the coating so applied to the roll until the desired coating of repellent material is obtained, said rigid material being sufficiently porous to absorb said repellent material solution in copious quantities.

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