

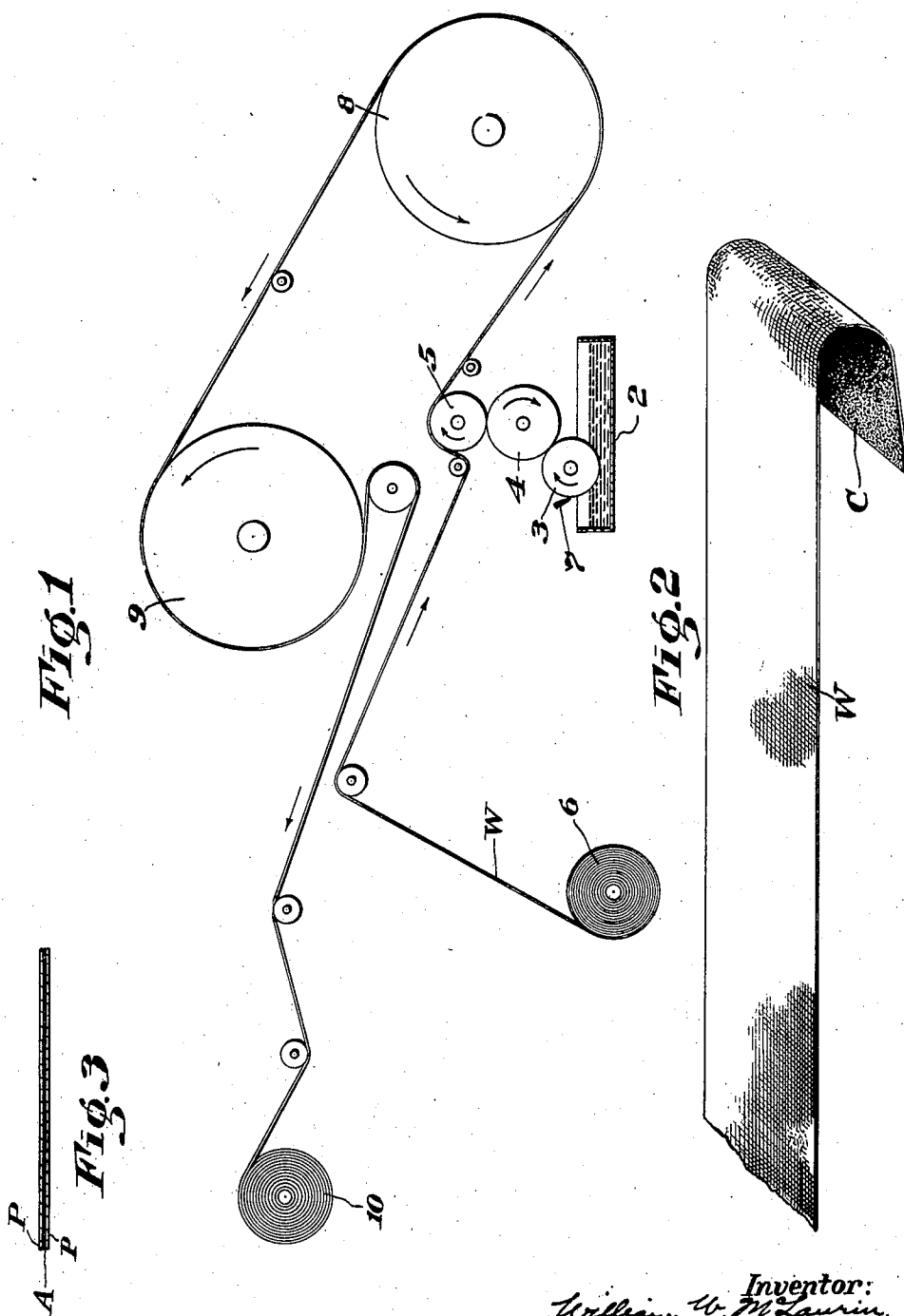
Feb. 5, 1935.

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1,989,875

METHOD OF MAKING SEALING AND REINFORCING TAPES AND SIMILAR PRODUCTS

Filed July 10, 1931



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UNITED STATES PATENT OFFICE

1,989,875

METHOD OF MAKING SEALING AND REINFORCING TAPES AND SIMILAR PRODUCTS

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Application July 10, 1931, Serial No. 549,933

7 Claims. (Cl. 91-70)

It has been proposed heretofore to make sealing and reinforcing tapes, wrapping papers, and the like, by coating suitable sheet material such as paper, inexpensive fabrics, and the like, with some water resistant material, asphalt being the substance most commonly used. The asphalt must be applied in a melted condition and at a fairly high temperature, say for example, from 400° to 450° F., and the necessity for applying the asphalt in this condition involves substantial disadvantages such as requiring relatively expensive equipment, and producing vapors and fumes which are objectionable. In addition, when the asphalt is applied to cloth, such as the cambrics much used for reinforcing cartons, it tends to penetrate the cloth instead of riding on one surface thereof, thus producing an unsightly product. In order to avoid this difficulty it is customary to fill the cloth, at least on one side, so as to hold the asphalt coating on the surface of the fabric. This step also increases the expense of manufacture of goods of this character.

The foregoing objections also apply to the manufacture of combined or laminated sheet materials in which asphalt or some similar water resistant adhesives are used to hold the plies together. Combinations of paper and relatively inexpensive fabrics are made in this manner and are much used for wrapping papers, bag materials, and the like. Plied papers also are made in this manner to some extent. In handling these materials the danger of scorching one or more of the plies is an important practical difficulty.

The present invention relates to methods of making products of the character above indicated. It aims to improve such methods with a view to reducing the expense of manufacture, facilitating the handling of the asphalt or other adhesive, and devising a simpler method of procedure.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawing, and the novel features will be particularly pointed out in the appended claims.

In the drawing,

Figure 1 is a diagrammatic view illustrating a method embodying features of this invention; and Fig. 2 is a perspective view of a strip of sheet material coated by the method illustrated in Fig. 1.

I have found that by emulsifying asphalts they can be applied to fabrics, paper, and the like, at normal or slightly elevated temperatures, and the coating so applied can subsequently be heated

sufficiently to break up the emulsion and leave the asphalt on the paper or other backing material in essentially the form in which it is present in these coated materials made by prior methods. When applied in this manner the asphalt exhibits relatively little tendency to penetrate fabrics, such as cambric, and those commonly used in reinforcing and sealing tapes, and in many of the combined products such, for example, as cloth lined envelopes. The adhesion of the coating to the backing material is substantially improved by the subsequent step of heating sufficiently to break up the emulsion. The coating so applied can also be substantially improved by combining a percentage of glue or other water soluble adhesive with the asphalt. For example, if 25% of a hard grade of animal glue is mixed with the asphalt emulsion, and this mixture then is applied to the backing material, the adhesive coating is greatly improved from the standpoint of adhesive strength, particularly if a thin coating only is used. In addition, the glue improves the stability of the emulsion, makes it dry better on the backing material, and improves the handling qualities of the coating compound.

I have found that the asphalt emulsions which are readily obtainable on the market can be used satisfactorily in this process. The composition of these emulsions necessarily varies with the requirements of different manufacturers, and an emulsion can readily be obtained which is made from asphaltum compositions having the flexibility which is desirable in sealing and reinforcing tapes and usually also in wrapping papers and combined sheet materials. These commercial emulsions customarily contain approximately 60% of asphalt and have a thick pasty consistency. Water can, however, be added to them to thin the emulsion sufficiently to give it the desired degree of fluidity to permit it to be handled in an ordinary coating machine, such as those used in manufacturing gummed papers and fabrics. I have obtained entirely satisfactory results by adding from 8% to 12% of water to the ordinary commercial emulsions and then applying them to paper or fabric in an ordinary coating machine. This reduces the asphalt content to approximately 50% of that of the entire mixture. If glue is to be added it should be dissolved in a suitable quantity of water so as to make, for example, a 50% solution, and this solution may be added to the emulsion with the desired amount of water to thin the emulsion. These constituents should be thoroughly mixed before taking them to the coating machine. Usually the quan-

tity of dry glue added will be somewhere between 10% and 30%, by weight, of the dry weight of the asphalt content of the emulsion.

An emulsion or a mixture of asphalt emulsion and glue prepared in the manner above described may be applied to a fabric, paper, or similar sheet material, in an apparatus such as that indicated in Fig. 1, the coating material being placed in a supply tank 2 equipped with a lifting roll 3, a transfer roll 4, and an applying roll 5. The paper, cloth or other backing material W usually is unwound from a supply roll 6 and is led over suitable guide rolls to the applying roll 5 where it receives a coating of the emulsion, the thickness of this coating being regulated by the setting of a scraper or doctor 7, as is well understood by those skilled in this art. As above indicated, this coating material can be applied at ordinary temperatures, although it is preferable to raise the temperature moderately, say to 90° or 100° F. in the event that a hard glue is associated with the asphalt. This is not necessary, however, if other kinds of glues are used, or if the glue is omitted.

After leaving the applying roll 5, the coated web of material passes around a drying drum 8 which is heated to a temperature high enough to dry the web sufficiently to permit it to be handled freely and to be rolled up. This drying operation may be performed in other ways, as will be evident to those skilled in the art of coating papers. The drum 8 usually is steam heated and the temperature maintained at its surface preferably is in the neighborhood of 190° or 200° F. so that the water will be driven out of the coating at a fairly rapid rate.

The coating preferably is next chilled to a temperature sufficiently low to make it hard and substantially non-tacky at normal temperatures. This may conveniently be done by running the coated web over a drum 9 through which water or other cooling medium is circulated. For most purposes the cooling of the coating to 90° or 100° F. at this drum is sufficient. The coated web then is wound up on a roll 10.

In making sealing and reinforcing tapes the web W will be slit at some stage in the process into strips of the desired width. This operation may be performed either in connection with the coating step or independently of it by transferring the roll 10 to a slitting machine.

This process completely avoids the objections above described to the earlier processes of making asphalt coated papers and fabrics. The fact that the asphalt does not have to be melted greatly reduces the expense for equipment required to manufacture these goods. Any danger of scorching or otherwise injuring the backing material due to the use of excessive heat is avoided and the expense for heat is reduced. The control of the entire operation also is simplified and the danger of producing unsalable goods is minimized. The process also is much cleaner and it is less objectionable from the standpoint of working conditions.

In making combinations of paper and cloth essentially the process above described can be followed, a second web of sheet material being combined with the web W after it has received its coating of adhesive and at any time before the coating is chilled sufficiently to cause it to harden. The two webs are pressed together at some point between the roll 5 and the cooling drum and travel together from this point through the remainder of the process.

This is a particularly satisfactory method of

making reinforcing wrapping papers, and combinations of paper and cloth for a great variety of purposes, such as paper bag stock, cloth lined envelopes, and the like. The added opacity given to the product by the coating is an advantage for many uses.

This method also lends itself advantageously to the manufacture of plied papers in which a high degree of opaqueness is desirable, as for example, in some decalcomania papers and more especially in the manufacture of the plied papers from which playing cards are made. The usual process of producing the desired degree of opacity in playing card stock is to combine webs of paper with an adhesive containing a very high percentage of lamp black or carbon in some other form. The same result can be obtained more economically by the method above described, the asphalt giving the high degree of opaqueness desired, while at the same time acting as an adhesive, whereas lamp black and similar ingredients ordinarily used for this purpose have just the opposite effect.

A product of this character is illustrated in section in Fig. 3, two superposed plies of paper being shown at P—P and the intervening layer of asphalt or the mixture of asphalt and glue being shown at A. It would be difficult to apply asphalt by the ordinary methods to these plies of paper without having it penetrate the plies to such an extent as to make the process impractical for use in the manufacture of playing cards, envelope stock, and other sheet materials where appearance is an important factor. This difficulty is avoided, however, by applying the asphalt or the mixture of asphalt and glue in an emulsified form and at moderate temperatures so that the tendency of the adhesive to penetrate the plies is minimized. The ability of this coating material to "ride" on the surface of the web to which the coating is initially applied may be increased or promoted by the use with the asphalt of suitable water soluble adhesives, such as a hard animal glue.

This method is especially useful in manufacturing sealing tapes of the character shown and described in my pending application Serial No. 531,053, filed April 18, 1931, both for those forms of reinforcing and sealing tapes in which a mixture of water resistant and water soluble adhesives is used, and also those in which a coating of a water resistant adhesive is used between a backing strip and an outer coating of water soluble adhesive to protect the latter from the adverse effects of atmospheric humidity and the like. In making the latter materials the asphalt or other water resistant material is applied first to the web W, Fig. 1, and this coating is dried and cooled in the manner above described. The coating of gum or other water soluble adhesive then is applied on top of the coating of water resistant material either at some point between the cooling drum 9 and the winding stand, or in a separate operation.

While I have herein shown and described preferred methods or processes, it will be understood that the invention may be practiced in other ways and that other applications of it may be made without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

1. That improvement in methods of making sealing and reinforcing tapes coated with a water resistant adhesive containing a high proportion

of asphalt, in a continuous process, which consists in applying the adhesive to the backing material at substantially normal temperatures and while the adhesive is in the form of an aqueous emulsion, and of such consistency that it does not penetrate through the backing material and subsequently breaking up said emulsion by driving most of the water out of the emulsion so applied.

2. That improvement in methods of making sealing and reinforcing tapes coated with a water resistant adhesive, in a continuous process, which consists in applying to a web of backing sheet material at substantially normal temperatures, a coating of an adhesive compound containing a high proportion of asphalt while said adhesive compound is in the form of an aqueous emulsion, and of such consistency that it does not penetrate through the web subsequently heating the coating so formed sufficiently to break up said emulsion by driving out such a proportion of the water therefrom as to make the coating hard at normal temperatures.

3. That improvement in methods of making sealing and reinforcing tapes coated with a water resistant adhesive containing a high proportion of asphalt, in a continuous process, which consists in applying the adhesive to the backing material at substantially normal temperatures and while the adhesive is in the form of an aqueous emulsion said emulsion having an asphaltic content approximating 50% of the entire mixture and being of such consistency that it does not penetrate through the backing sheet, and subsequently breaking up said emulsion by driving most of the water out of the emulsion so applied.

4. That improvement in methods of making sealing and reinforcing tapes coated with a water resistant adhesive containing a high proportion of asphalt, in a continuous process, which consists in applying the adhesive to the backing material at substantially normal temperatures and while the adhesive is in the form of an aqueous emulsion of such consistency that it does not penetrate through the backing sheet, drying the coating so applied to break up said emulsion by driving most of the water out of the emulsion, and then applying a second coating of water

soluble adhesive to the exposed surface of the first coating.

5. That improvement in methods of making sealing and reinforcing tapes coated with a water resistant adhesive containing a high proportion of asphalt, in a continuous process, which consists in mixing a water solution of glue with an aqueous emulsion of asphalt while maintaining the asphalt in its emulsified condition, applying a coating of said mixture to the backing sheet material at substantially normal temperatures and while the mixture is of such a consistency that it does not penetrate through the backing sheet, and subsequently breaking up said emulsion by driving a sufficient proportion of the water out of said coating to cause it to harden at normal temperatures.

6. That improvement in methods of making sealing and reinforcing tapes in a continuous process, which consists in applying a coating of an aqueous asphalt emulsion to the surface of a backing strip of sheet material, at substantially normal temperatures, and associating directly with said emulsion, a sufficient proportion of a water soluble adhesive to cause the tape to adhere to a carton, or the like, after said coating has dried and when it subsequently is moistened with water, so controlling the consistency of the emulsion that it does not penetrate through the backing strip, and subsequently drying the coating so applied to break up said emulsion by driving most of the water out of the emulsion.

7. That improvement in methods of making sealing and reinforcing tapes in a continuous process, which consists in applying to the surface of a backing strip of sheet material at temperatures approximating 90° to 100° F., a coating comprising an aqueous asphalt emulsion mixed with an aqueous solution of glue in a mixture of such consistency that it does not penetrate through the backing strip, the asphalt being the predominating constituent and the glue being present in from approximately 10% to about 30% of the dry weight of the asphalt, and subsequently breaking up said emulsion by driving most of the water out of the mixture.

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