

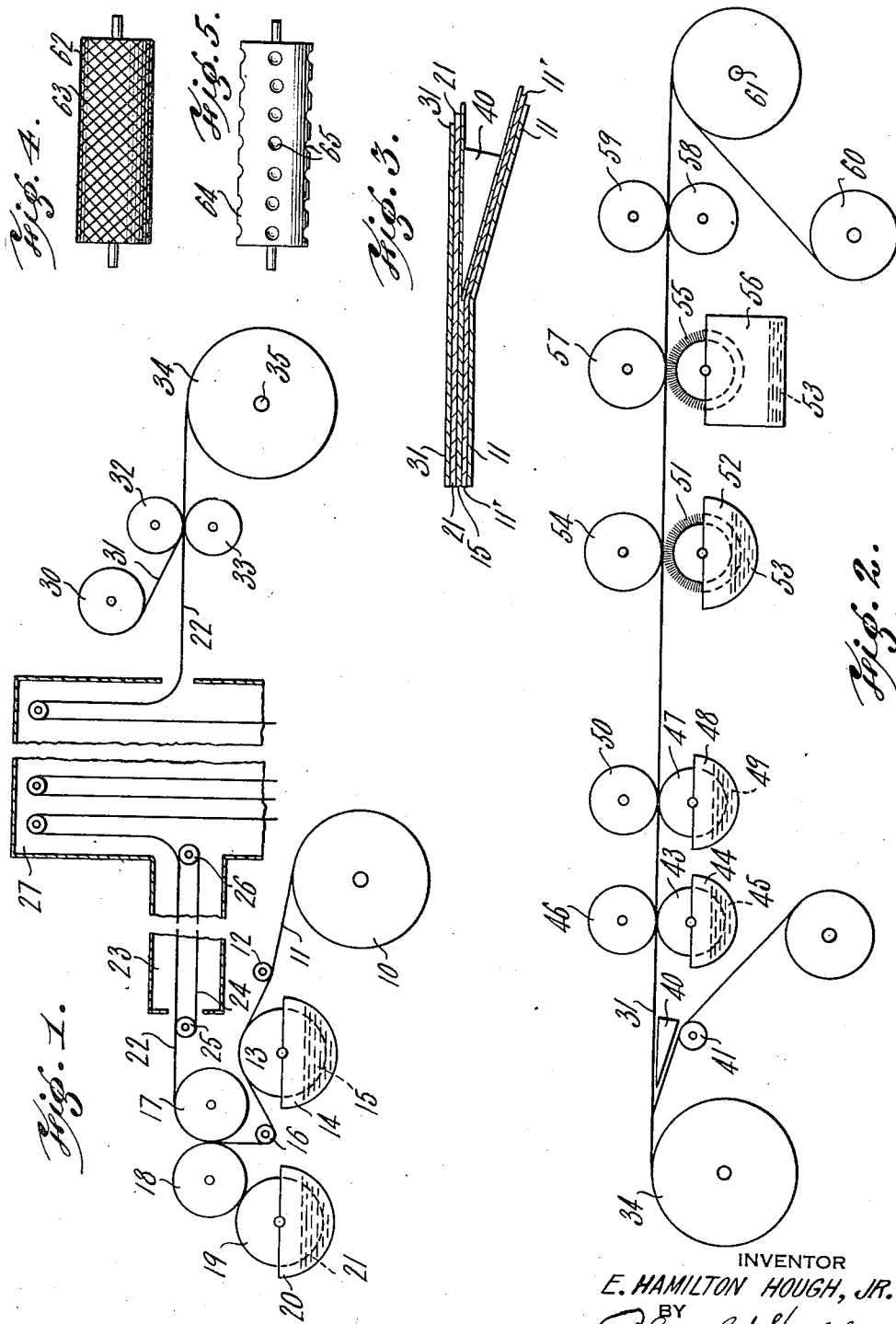
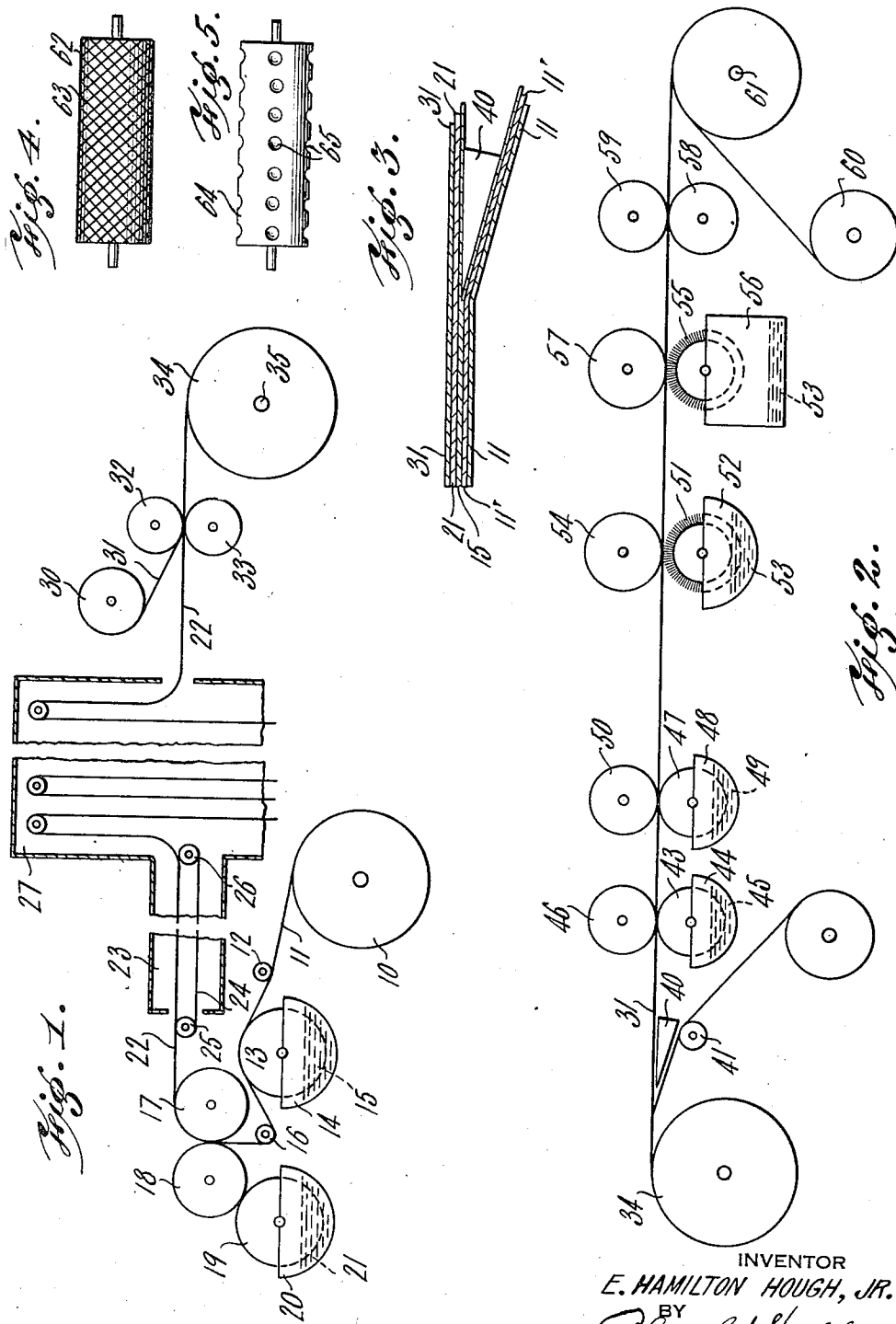
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COATED MATERIAL AND METHOD OF MAKING SAME

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COATED MATERIAL AND METHOD OF
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This invention relates to coated material and particularly to a process of coating fabrics to which it is difficult to apply soft, smooth and continuous paint or enamel coatings. The invention is also concerned with the novel product produced by the process.

The invention is directed broadly toward the coating of fabrics, or flexible fibrous sheets, with soft, smooth, continuous and pliable coatings, whereby the said fabrics or fibrous sheets are rendered waterproof and soil-resisting. Flexible sheet material treated by the procedure of the present invention is adapted for use as draperies, coverings, upholstery, awnings and many other purposes for which material coated or impregnated with ordinary paint or enamel has heretofore been unsuited. While the ordinary oil paints, varnishes or enamels and even lacquers are well adapted to use with the present invention, the same is particularly applicable to that class of coatings known as "elastic" varnish enamels or "elastic" coatings which are characteristically soft and pliant as distinguished from hard and brittle and which, therefore, may be subjected to considerable flexure without breaking or cracking.

While it is not new to coat fabrics or other fibrous material as by brushing, spraying, etc., with various types of coatings, such coatings, when they are applied in liquid form as oil paints, varnishes or enamels, or even lacquers, are relatively hard and stiff and on being subjected to flexure, exposure or wear soon crack or chip. For these reasons they are not adapted for use for draperies, upholstery, coverings, etc., where a smooth, soft, pliant, wear- and soil-resisting material is required. One reason why such known materials are hard and stiff is because it is necessary, in order to apply a liquid coating material, to treat the fabric or other fibrous body with a sizing of one kind or another in order to prevent the coating material from impregnating the base on which it is applied, and to enable a smooth, continuous surface of coating material to be obtained. Such sizings become hard and stiff and render the coated material hard and stiff. If no sizing is used, the treated material becomes impregnated rather than coated and the treated material becomes dry and hard and does not possess a smooth, continuous surface.

Coatings of relatively thick, pasty material have also been applied to fabrics and fibrous sheets. Such coatings are usually applied with a spreader knife or bar and give a relatively

thick coating which is stiff and likely to crack, and is unsuited for purposes where a thin, soft, pliable coated material is required.

An object of the present invention is to provide for the application of the coating of oil paint, varnish or enamel, preferably of the class known as elastic coatings or "elastic" varnish enamels which are soft and pliant as distinguished from hard and brittle, to fabrics or suitable fibrous sheets which would ordinarily absorb such material to an extent which would make it impossible to procure a smooth, continuous and even surface, or, if applied to a base material which has previously been sized, would yield too stiff a coated product.

Another object of the invention is to provide a process by which the above described application of coating material may be accomplished in a simple and novel manner which avoids the difficulties heretofore encountered in achieving this result.

A further object is to provide a substantially continuous process whereby material may be coated with a soft, pliable, continuous, smooth coating.

A further object is to provide a product which comprises a coated fabric or other suitable fibrous combination which is very thin, soft, smooth and pliant and which has a coated surface firmly bonded to its base.

A further object is to provide a coated surface for fabrics or suitable fibrous sheets which is smooth, continuous and waterproof and unusually resistant to wear and to the accumulation of dust and dirt thereon.

A further object is to construct a smooth, waterproof covering material in the form of a continuous sheet and independent of any fibrous re-enforcement.

Other objects and advantages of the invention will more clearly appear when reference is had to the accompanying specification and drawing.

In the drawing, Fig. 1 is a diagrammatic elevation of a series of instrumentalities through which the first steps of my process may be accomplished; Fig. 2 is a diagrammatic elevation of the instrumentalities through which my process may be completed; Fig. 3 is a diagrammatic view, greatly enlarged, of a section of the composite material produced by the method of the invention at the point where it is separated into its constituent parts; and Figs. 4 and 5 are side elevations of transfer rollers which may be utilized in the practice of my invention.

In Fig. 1, 10 designates a roll of sheet material,

for instance, paper 11, preferably coated with lacquer or a suitable sizing. The roll is mounted so that the paper may be unwound therefrom and passed over the rollers 13 and 17. Take-up rollers 12 and 16 serve to take up the slack and keep the paper firmly contacted against rollers 13 and 17. Roller 13 may be arranged to rotate in a bath 15 of relatively non-drying oil or grease contained in trough 14, and by contacting against the lacquered or sized surface of the paper 11, transfers thereto a thin coating of oil. The trough 14 may be provided with a suitable agitator or other device (not shown) designed to maintain the oil or grease continuously in contact with the roller 13 so that a uniform film is applied to the surface of paper 11.

Roller 19 may be provided to rotate in a trough 20 which is kept filled with the coating material 21,—for instance, a varnish consisting of 90 parts spar varnish and 10 parts raw linseed oil mixed with an appropriate quantity of pigment. Offset roller 18 contacts against roller 19 and transfers a thin layer of the coating material on the oily surface of the paper 11. Roller 18, under certain conditions, may be replaced with a different type of roller as will hereinafter be explained.

The material so treated, designated now as 22, may be carried by a conveyor belt 24 supported by rollers 25 and 26, through a drying chamber 23, which is shown broken away in Fig. 1 in order to conserve space for purposes of illustration.

In this drying chamber the coating is subjected to a temperature of approximately 80° to 200° F. sufficient to enable the coating material 21 to take on an initial set. From the drying chamber the material may be led into a festooner 27 of any suitable type in which the composite material is draped over rollers while being subjected to heat conditions. The temperature and time of drying are dependent, of course, upon the particular drying and setting qualities of the coating material used, the basic factor for consideration being that the material must be brought to a semi-dry, tacky condition suitable for pressing upon the fabric as will now be explained. Under some conditions the treated material may be obtained in proper condition when it emerges from the drying chamber, and in such case the use of a festooner will be unnecessary; and, as the dryer is used merely to accelerate the drying or setting of the coating, there may be some coatings which dry sufficiently hard at room temperatures and a drying apparatus will with such a coating be unnecessary.

On emerging from the festooner, the coating 21, which is in the relatively moist, semi-dry or slightly tacky condition above referred to, is led between pressure rollers 32 and 33 between which is also led a sheet of fabric or other suitable material 31 from the roll 30. The fabric is thus pressed firmly against the tacky coating, which latter is simultaneously pressed into the interstices of the fabric and bonded or keyed firmly between the constituent yarns or threads thereof to give a smooth, continuous surface coating. The composite material thus formed is rolled onto a roll 34 on beam 35. Subsequently, in the event that an embossed surface is preferred over a smooth one, an embossing device such as a suitably embossed roller, may be contacted against the coating in order to give the desired embossed finish.

The precise point at which the coating 21 is to be considered as in the proper condition for

the uniting operation must, as above indicated, depend upon the characteristics of the particular coating used. However, it may be stated that it should not be so dry or hard that it cannot be pressed firmly into the fabric and thus be bonded firmly thereto, and it must not be so wet that it will be absorbed into the constituent yarns or threads of the fabric.

In order to remove the base material upon which the coating has been built, the roll 34 is suitably supported as indicated in Fig. 2, and the composite material drawn therefrom. The fabric with its applied coating is drawn between rollers 43 and 46 and through various other instrumentalities which will be later referred to. The sized paper may be peeled from the fabric as by a blade or guide 40 which divides the composite material along its oiled or greased layer 15, as indicated in Figs. 2 and 3. The coated paper is drawn over roller 41 and wound upon reel 42 for reuse.

Rollers or brushes 43 and 47 are arranged to rotate in cleansing material 45 and 49 consisting of suitable oil or grease solvents, contained in suitable troughs 44 and 48. While passing over these rollers, the coated surface of the fabric is thoroughly cleansed of oil or grease which has accumulated thereon during the process. At this point the material, if it has been treated with a coating material in which color has been incorporated, is practically completed and may be wound with or without a suitable liner upon a drum upon which it may be dried over night preparatory to shipment. It can also be unrolled from the drum and more completely dried, or it may be led directly from the cleansing apparatus to a drying apparatus and subsequently rolled upon a drum preparatory to shipment. If, on the other hand, a coating material has been applied which lacks color, a subsequent coating may be applied to give the desired finish,—for instance, a metallic coating designed to give a gilt or silvery finish. This may be accomplished by brush 51 rotating in a suitable trough 52 which contains finely divided metal powder. The brush is preferably rotated at a speed greater than the speed of the fabric in order that the metal powder may be effectively distributed thereover. The roller 54 on the top of the fabric provides a support against which this operation may be carried out. Brush 55 journaled over a suitable receptacle 56 may also be provided to remove surplus powder and this brush also revolves at a speed greater than the speed of the fabric. Roller 57 likewise provides a support for the other side of the fabric during the brushing operation. A buffing or polishing drum 58 may be provided to polish the surface, and roller 59 provides a foundation on which this operation may be carried out. The material may then be wound with liner 60 upon a beam 61 where it is rolled preparatory to any drying treatment desired, or, as previously explained, the material may be led directly to a drying chamber and complete drying had before rolling preparatory to shipment.

A feature of the present invention is that a smooth, continuous surface is obtained even though dust or other foreign particles become intermixed with the coating material or lodge on the coated surface during processing. Such particles are pressed into or against the fabric or other material to which the coating is applied and do not protrude from the smooth surface formed by the pressing rollers 32 and 33. An-

other feature is that very thin films of coating material, considerably thinner than the films of coating material at present known as applied to fabrics and fibrous sheets, may be very easily obtained.

While the invention has been described in connection with the ordinary paints, varnishes or enamels which dry into a soft, pliable coating, other coating materials may be used. For instance, latex of suitable viscosity, and in which suitable vulcanizing ingredients, including suitable accelerators, have been incorporated, may be used, and the drying treatment adapted to bring about a coagulation sufficient to put the coating in condition for the uniting operation, vulcanization being subsequently accomplished in any desired manner, as by letting the material stand for a few weeks at room temperatures in order to enable high power accelerators of vulcanization to act.

In some cases it may be desirable to produce a unitary sheet consisting of the coating material alone without any supporting fabric or fibrous body. In such case the material is taken from the apparatus before it passes through squeeze rollers 32 and 33 and, of course, no base material is applied. It is then peeled from the support 11 or removed therefrom in any desired manner. Also, it may be expedient, whether or not the coating is united with a base fabric or other support, to apply additional layers of coating material in order to obtain increased strength, better covering, etc., applied by brushing or spraying or by contacting the surface with another transfer roller in the manner already described.

In Fig. 4 is illustrated a transfer roller 62 with a suitable design, for instance, a web 63, embossed thereon. This may be substituted for roller 18 in Fig. 1 in order to produce a design effect. In such case the process is carried out as previously described except that roller 62 is used to transfer the desired design to the oiled or greased surface of the sheet 11. As an example of how this may be accomplished, a green color may be applied with design roller 62. After the material is taken from the dryer or festooner, it may then be contacted with a smooth transfer roller, which may be arranged to apply a coat of contrasting color, for instance, red,—the composite coating being then subjected to conditions designed to bring it into a semi-dry, tacky condition preparatory to the subsequent stages of the process. When this material is stripped from the base on which it was built, and finished, it leaves a red background in which the desired design is effectively inlaid. The product is an inlay rather than an applique or overlay and possesses a smooth, continuous, waterproof surface free from embossments or heavy layers of coating which would be likely to crack, peel or chip when subjected to flexure or wear.

In order to produce a covering for an object, the material produced by the process as used without a fibrous re-enforcement may, of course, be subsequently cut out in the form desired, for instance, with suitable openings to allow projections on the object to be covered to extend through it. A considerable saving may be effected, however, if a roller of the type indicated in Fig. 5 is used in the place of roller 18 of Fig. 1. Such a roller 64 may be provided with recesses 65 which prevent the coating material from being applied on the areas corresponding to the

recesses of the roller 64 and these recesses may be very readily designed to leave cut-outs in the finished film at the points where they are desired in the covering. Patterns can thus be formed without the use of dies or stamping machines, thus effecting a considerable saving in subsequent processing.

What I claim is:

1. The process of making a design coating comprising applying a non-drying oleaginous material to a base, superimposing thereover in a predetermined design, a film of coating material of the elastic varnish enamel type, drying the same, superimposing over said last mentioned film a continuous film of coating material of a contrasting color, and drying the same to a tacky condition, uniting said combined films with a suitable fibrous sheet and then removing the base on which said films were built.

2. The continuous process of coating comprising applying to the surface only of a continuous temporary foundation sheet a thin layer of non-drying oleaginous material free from volatile solvents, superimposing upon such layer a smooth even layer of elastic coating material, drying said second layer to a tacky consistency, uniting said tacky layer to a fabric by pressure, separating the composite sheet so formed along said first layer, and removing said foundation sheet, cleansing the second layer and then drying and finishing the same.

3. The continuous process of coating comprising applying to the surface of a continuous sheet a thin layer of non-drying oleaginous material, superimposing upon such layer a smooth, even layer of elastic coating material, drying said second layer to a tacky consistency, mechanically uniting said layer to a fabric, separating and removing said first mentioned continuous sheet, cleansing the said layer of coating material and then drying and finishing the same.

4. The continuous process of coating comprising applying to the surface of a continuous sheet a thin layer of non-drying oleaginous material, superimposing upon such layer a smooth, even layer of elastic coating material, drying said second layer to a tacky consistency, uniting said layer to a fibrous sheet, separating and removing said first mentioned continuous sheet, cleansing the said layer of coating material and then drying and finishing the same.

5. The continuous process of coating comprising applying to the surface of a continuous sheet a thin layer of non-drying oleaginous material, superimposing upon such layer a smooth, even layer of elastic coating material, drying said second layer to a tacky consistency, uniting said layer with a fibrous sheet by pressure and then separating the thus coated fibrous sheet.

6. The continuous process of making an impervious unitary covering comprising applying to the surface only of a continuous temporary foundation sheet a thin layer of non-drying oleaginous material, superimposing thereon a smooth even layer of elastic coating material, drying said second layer, separating the composite sheet thus formed along said first layer and removing said foundation sheet, cleansing the second layer and then drying the same.

7. The process of coating a fabric comprising forming upon a transfer sheet a coating of non-drying oleaginous material, immediately placing thereon a film of coating material, drying said film to a semi-plastic condition, keying said semi-plastic film directly into a fabric by pres-

sure only, separating and removing the thus coated fabric from the transfer sheet at the layer of oleaginous material, and then finishing the coated surface of the fabric.

- 5 8. The process of coating a fabric comprising forming upon a transfer sheet a coating of non-drying oleaginous material, immediately placing thereon a film of coating material, drying said film to a semi-plastic condition, keying said

semi-plastic film directly into a fabric by pressure only, separating and removing the thus coated fabric from the transfer sheet at the layer of oleaginous material, cleansing the remaining portion of said layer, covering said coated surface with a dry color and then polishing the same. 5

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