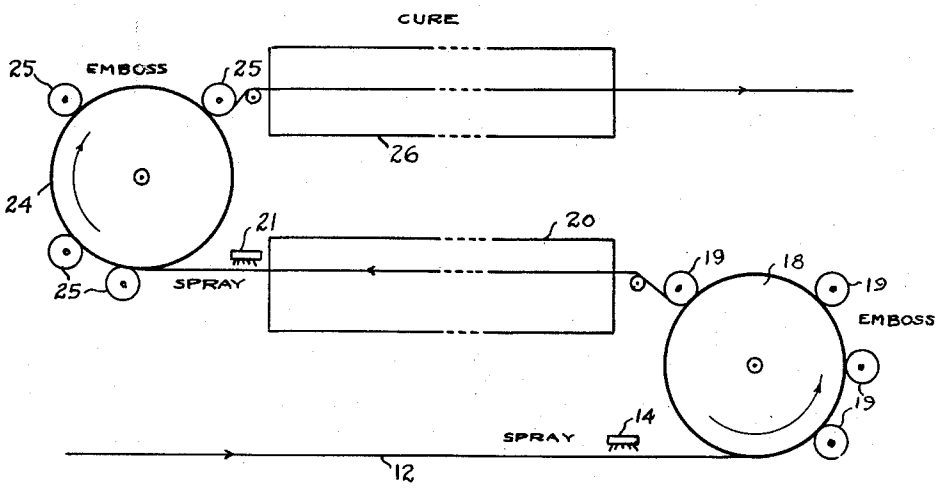
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METHOD FOR DOUBLE FACE COATING AND EMBOSSING RUG CUSHIONS

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METHOD FOR DOUBLE FACE COATING AND EMBOSSING RUG CUSHIONS

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This application relates to methods for making rug cushions and more particularly felt base rug cushions coated with rubber-like films embossed and patterned on opposite sides of the cushion.

The method may be described as the coating of a felt base with a wet coating in the form of an aqueous liquid suspension of elastomeric particles into a coherent gel-like film by coalescing the particles on the surface only of the felt base, while at the same time imparting to such coating a desirable embossed surface configuration and also at the same time evaporating the suspending liquid water medium. Thereafter the patterned gel-like film of coalesced elastomeric particles formed with as little pressure from the embossing rolls as possible is subsequently vulcanized or cured to produce the finished rug cushion, characterized by a minimum degree of impregnation of the melt base by the coating.

The improvement of this application relates specifically to coating on both surfaces of the felt base and comprises a series of steps by which both faces may be coated satisfactorily.

For an understanding of the method and apparatus hereof reference should now be had to the appended drawing which shows diagrammatically a coating apparatus of the invention.

The apparatus

The apparatus comprises means for directing a web or base **12** of thick soft matted felted fiber past means **14** for coating what is to become an embossed face of the rug cushion, such means being preferably a spray coating means as shown. The base **12** now coated on its first face, passes under a heated embossing or patterning roller **18**, with the coated face remaining in contact with the roll **18** from approximately the 6 o'clock position to the 2 o'clock position, reading counter clockwise.

Roll **18** is formed with a negative grooved embossing pattern of ridges and indentations to emboss a pattern in the coated face and suitable pattern is that of the patent to Gordon 2,541,868 of February 13, 1951, whose disclosure is incorporated by reference into this specification.

In its travel over the heated embossing roll **18**, the web is in contact with hot quick drying rolls **19** which partly dry the embossed coating during and immediately after the embossing.

The web, coated on one face, now moves through a drying oven **20** which further partly dries the wet embossed coating and then the web passes by a second coating means for the other face, the latter being in the form of a spray coating means **21**. So coated, the web passes over a second hot embossing roll **24** and between it and additional quick drying hot rolls **25** and then to a second oven **26** which is sufficiently hot to cure the two partly dried gel-like films formed by the spray coating means **14** and **21** patterned by the hot embossing rollers **18** and **24**.

The specific features of the present application will now be developed in some detail.

It will be noted that the first face of the web **12**, coated at **14** and hot embossed at **18**, is quite well dried, though

not cured or vulcanized, before the web reaches the second means **21** and especially before the web reaches the second hot embossing means **24**. The drying of the first face coating and the web as well as effected to a degree sufficient to stabilize and pattern the first coat but especially to eliminate all but a small quantity of steam from the web before the second coating from spray **21** is subjected to the action of the hot embossing roll **24**.

It was discovered that unless the web and the first coat are dried sufficiently for this purpose before the web reaches the second hot embossing roller **24**, steam was developed before and during the second embossing step, and this operated to break down mechanically the first coat already applied to the web and patterned and gelled but not yet cured. It was discovered that the cause for defective products was due to the action of the steam produced in the second embossing step and the difficulty was solved by providing a considerable drying of the web and the first coat and gelating and stabilizing the latter before the web reaches the second embossing roll.

In the preferred embodiment the web and the first coat are dried considerably before the second coat is applied, but it is entirely possible, though experience has not yet demonstrated that to be the case, that the second coating may be applied before the first coating is dried. The important requisite seems to be that before the second coat is embossed in the hot embossing roller, that the first coat and the web as well should be dried and stabilized to the extent indicated.

The degree of drying will of course be determined by numerous factors such as the thickness of the web, the thickness of the coat, and environmental conditions.

It is important to note that the drying of the first coat effected by means of the hot rolls **19** and the first pass through the oven **20** is only for the purpose of drying the web and the first coat and the drying must be insufficient to cure or vulcanize the first coat. In the process the curing or vulcanizing of the coating is effected after both coatings are applied and gelled and patterned and partly dried. Hence, care must be taken to avoid curing of the first coat before the second coat is embossed and likewise to be sure that curing of each coat is effected after that coat is embossed and patterned and partly dried and should not be effected simultaneously with the embossing of that coat.

Likewise, though this is a routine matter in rubber curing, care must be taken to avoid over-curing the coatings.

It should also be observed that the specific apparatus herein disclosed employs long passes through ovens for drying and curing the coatings and particularly for drying the web and first coating between the first coating embossing roll **18** and the second coating embossing roll **24**. This type of apparatus permits of the required degree and travel time for drying the web and first coating and for curing both coatings even though the machine as a whole operates at a remarkably high output speed. The type of machine illustrated here, wherein two flights or passes through ovens are utilized for drying the web and first coat, and for curing both coats, is such that the steps are sufficiently separated both physically and in time, so that the steps can be controlled individually and each part of the apparatus, namely each of the two embossing rolls and each of the two ovens, are individual parts which can be individually controlled and adjusted.

Now having described the apparatus and method herein disclosed, reference should be had to the claims which follow.

I claim:

1. A method for coating and embossing rug cushions on opposite faces, wherein the cushion to be coated is a thick, soft, matted, felted fibrous web, and wherein

each coating is a cured elastomeric film of a resilient rubbery composition having sufficient thickness to be self identifiable as a coherent rubbery layer and formed of an aqueous liquid suspension of solid particles of an elastomeric material, which is applied to said base as a wet coating and first transformed by heat and pressure with a patterned embossing roll into an embossed coherent wet gel-like film of coalesced particles and later vulcanized, said method comprising wet coating one face of the web, roll embossing said coating, while it is still wet, with heat and pressure, drying coating and web sufficiently to stabilize said coating and to eliminate all but a small quantity of steam from said web at a temperature insufficient to cure the elastomer, and then when said single coating and web are sufficiently dry, wet coating the opposite face of said web and roll embossing that face, while it is still wet, with heat and pressure, and finally curing both coats and drying them and the web thoroughly.

2. A method for coating and embossing rug cushions on opposite faces, wherein the cushion to be coated is a thick, soft, matted, felted fibrous web, and wherein each coating is a cured elastomeric film of a resilient rubbery composition having sufficient thickness to be self identifiable as a coherent rubbery layer and formed of an aqueous liquid suspension of solid particles of an elastomeric material, which is applied to said base as a wet coating and first transformed by heat and pressure with a patterned embossing roll into an embossed coherent wet gel-like film of coalesced particles and later vulcanized, said method comprising wet coating one face of the web, roll embossing said coating, while it is still wet, with heat and pressure, drying the coating and web

at a temperature insufficient to cure the elastomer sufficiently to stabilize said single coating and to eliminate all but a small quantity of steam from said web, and then when said coating and web are sufficiently dry, wet coating the opposite face of said web and roll embossing that face, while it is still wet, with heat and pressure, and finally curing both coats and drying them and the web thoroughly, each embossing step including quick drying of the embossed coating during and immediately after the embossing by a hot roll in contact with the web at that time in contact with the embossing roll.

3. Method for coating and embossing rug cushions on opposite faces, said rug cushion comprising a thick soft matted felted fibrous web and the coating is a cured elastomeric film of a resilient rubbery composition comprising a rubbery layer formed from an aqueous latex of solid elastomeric particles, comprising applying to one face of said web, then hot embossing and then drying to remove substantially all of the liquid water without curing the elastomeric latex coating on said face, then applying and then embossing an elastomeric latex coating upon the opposite face of said thick fibrous web of material comprising the rug cushion base, substantially drying the second coating and finally curing both coatings.

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