June 24, 1930. J. B. CAMPBELL 1,766,878

ORNAMENTATION PROCESS AND APPARATUS THEREFOR

Filed Nov. 9, 1925 2 Sheets-Sheet 1

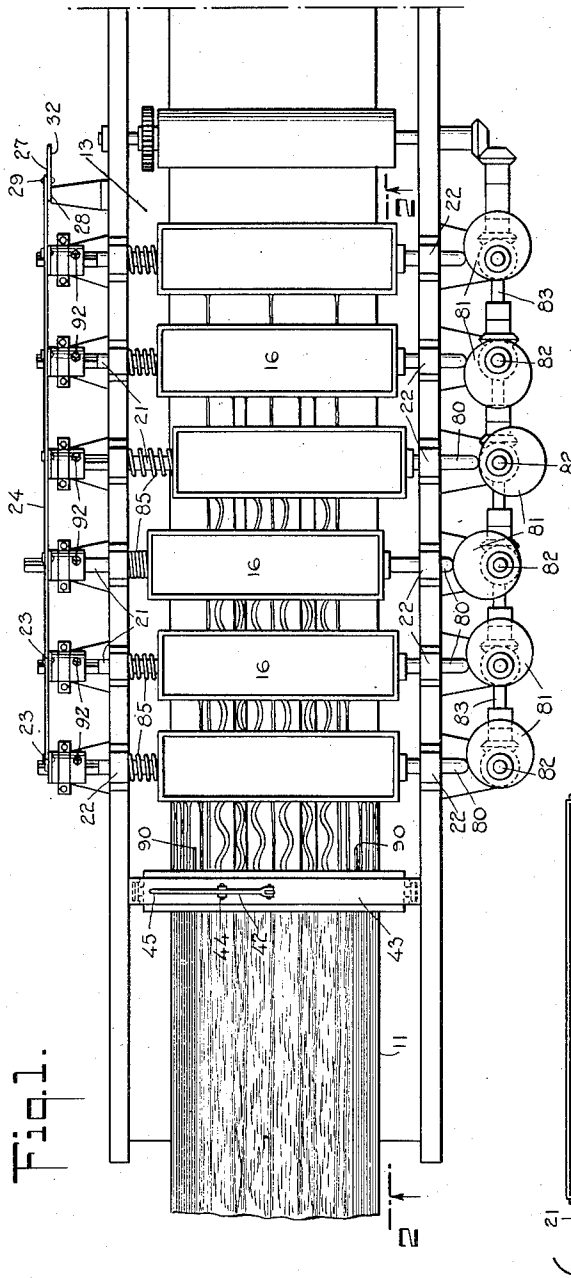


Fig. 1.

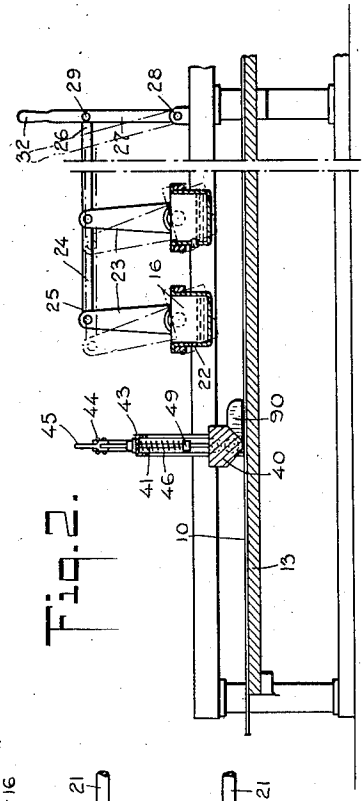


Fig. 2.

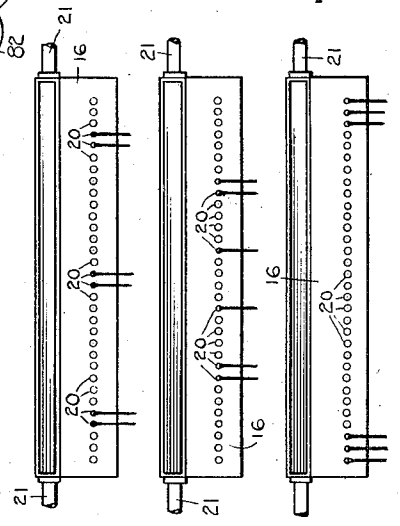


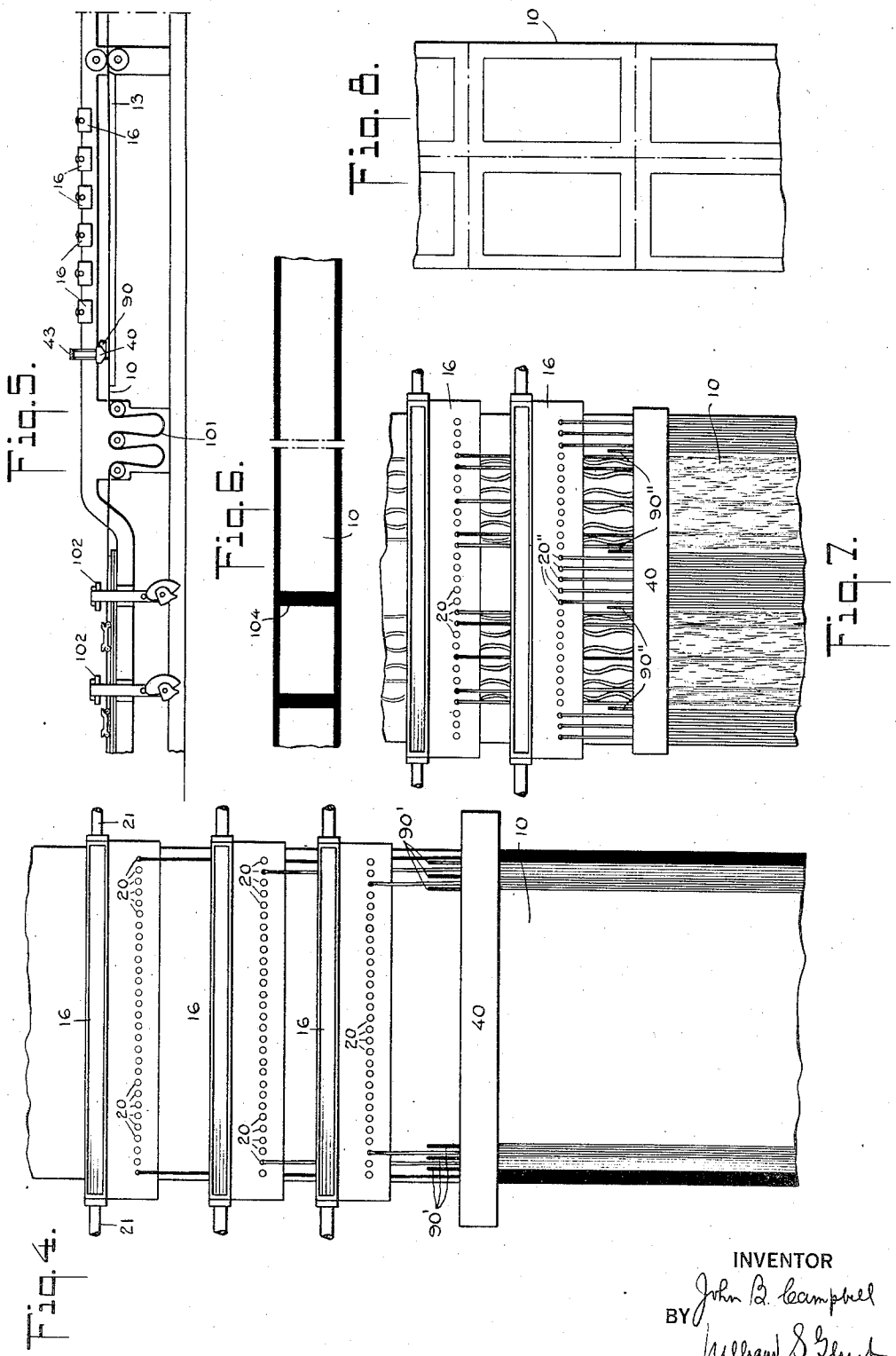
Fig. 3.

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ORNAMENTATION PROCESS AND APPARATUS THEREFOR

Filed Nov. 9, 1925 2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

JOHN B. CAMPBELL, OF SALEM, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CARTHAGE MILLS INCORPORATED, OF CINCINNATI, OHIO, A CORPORATION OF OHIO

ORNAMENTATION PROCESS AND APPARATUS THEREFOR

Application filed November 9, 1925. Serial No. 67,787.

My present invention relates generally to the coating of materials and more particularly to a process and apparatus for producing the complete predetermined ornamental effect upon a floor covering material, such as a felt base floor covering by a continuous process and coordinately involves the production of a predetermined ornamental effect, without the employment of applicating means of fixed configuration or contour.

In accordance with the invention of the present application, my process contemplates among other things the production of a runner strip, by a continuous process and the illustrated embodiments show the production not only of the ground or body coating thereof, but also the border by the process hereinbefore referred to and hereinafter to be more fully described.

While my invention is herein illustrated and described as employed for the purposes of producing a ground having a striped, striated or wavy effect so as to simulate marble, granite or wood graining, it will be understood this is done merely for purposes of convenience, as my process and apparatus can be also employed for producing other characters of designs such as geometrical repeats.

The employment of applicators such as printing rollers or blocks for producing predetermined designs upon a floor covering surface is not only inconvenient and expensive because of the necessity of employing a different applicator for such design, but in addition, I have found that effects such as marbleizing or wood graining cannot be effectively produced with applicators of this character not only because of the fact that there is a limit to the number of colors that can be employed practically, but also because of the fact that marble or wood graining effect necessitates the intermingling of shades and tints which cannot possibly be attained by these methods or the employment of such apparatus.

Neither the mash block process nor a printing roller process can possibly give a shading off or merging of one color into another because of the fact that even though successive colors are merged, they will be merged at a time when one has reached a greater degree of dryness than the other and furthermore in the use of a printing roller, its action is to suck up the paint with it as it moves away from the printed surface.

One of the objects of my invention is the production of an ornamental surface upon a floor covering or similar material in which I dispense with the employment of applicators having surfaces of predetermined conformation or contour and intended to produce corresponding predetermined design impressions upon the surface of a floor covering, such as a felt base product, of which applicators printing rollers or blocks are examples.

Another object of my invention is an arrangement for producing ornamentation in which the paints are deposited on a surface in a stream and the ornamental effect which it is desired to produce is dependent to a great extent upon the relative movement between the material being ornamented and the applicators, and more particularly an arrangement whereby paints so deposited are treated to cause the different colors where different colors are used, to shade off into each other and at times to intermingle and produce new tints so as to enhance and more effectively approach the desired marbelized or wood graining effect.

Another object of my invention is the provision of an arrangement whereby the coloring matter is applied by applicators made up of standardized units arranged to discharge upon or supply material to the surface to be ornamented, the character of design attained being dependent upon the surface upon which these units discharge and the units being so arranged as to be capable of discharging variably upon different portions of the surface so that any unit or group of units discharging upon predetermined portions will give a predetermined design.

In the apparatus herein illustrated, I show broadly the employment, for the production of the body coating of the strip of material, of a series of controls or units each of which serves to control the application to a predetermined portion or to predetermined por-

tions of the surface to be coated of a coating material from a single source, so that by varying the character of coating material at each source such as by using differently colored coated material, provision can be made for a variation of the color effect upon the surface to be coated without a change in design. Furthermore, by a change in the units or by a change in the predetermined portions of the surface upon which each unit deposits, an unlimited variety of designs can be produced due to the relative movement between the surface being ornamented and the sources of the deposits.

The deposits will be arranged generally longitudinally of the strip and in the direction of the line of movement of the strip and where the deposit is continuous for predetermined periods, line of deposits will also be continuous for predetermined lengths depending upon how long the application of the deposits is continued.

In accordance with my invention it will be further understood that the points of application of the deposits from the different sources may be shifted relatively transversely of the line of movement of the material, predeterminedly or otherwise, so as to cause the lines of deposit while running generally lengthwise of the material to be wave-like thereacross, as it were.

Another object of my invention is the treatment of these lines of deposit so as to cause the coloring matter in one or more lines of deposit to spread beyond the original area upon which they have been deposited to cause not only a shading off in the color deposit but also in commingling of adjacent deposits whereby new tints or shades are produced.

My invention further provides for an arrangement by which each unit or group of units can be given a movement laterally of such direction of movement to simulate a graining effect so that by the movement of a number of units, each of which or each group of which may control different colors where so desired, a varied colored graining effect may be produced by the compound relative movement of the units and the surfaces to be coated and in my preferred embodiment, these units are in the form of a series of containers, each of which is characterized by the differential positioning of the points of discharge of the material therefrom so that by combining these units differentially, any desired character of deposition can be attained.

A still further object of my invention is the production of a runner from a strip and this phase of my invention involves an arrangement whereby the body coating is applied uninterruptedly to the strip while the strip is in motion and the runner border also applied while the strip continues to move.

Another object of my invention is the simultaneous application of coatings to a strip of material to produce both a ground or a body coating and the border as where a runner or rug is to be produced and more particularly the application of such coatings by a continuous process which involves the deposition of materials of different characters along lines extending generally longitudinally of the strip and positioned laterally of each other across the strip.

In accordance with my invention where it is desired to produce a border for a runner or the like, I provide therefore an arrangement by which the material applied by or discharged from certain controls or units are prevented from spreading in one direction transversely of the strip and more particularly an arrangement by which the material deposited to form the border of the strip is separated from the body thereof by a sharp and definite line of demarkation.

Another object of my invention is the production of rugs in which the ground as well as part of the border is produced by a process such as has been hereinbefore referred to and in which the rest of the border is produced by the application of an impression member.

My invention further contemplates an arrangement of employing my process and apparatus for the production of runner repeats positioned side by side transversely of the strip as well as the production of a series of rug repeats so positioned.

My invention generally involves the process and apparatus for the coating of floor covering whereby a better wearing surface is produced in less time and at less expense and which has a higher ornamental character and further involves an arrangement whereby such coating is particularly adaptable to the forming of either a continuous runner or rug repeats and in addition, involves an arrangement whereby a border of a higher effective character can be applied in less time and at less expense.

For the attainment of these objects and such other objects as may hereinafter appear or be pointed out, I have illustrated embodiments of my apparatus for practicing my process, in the drawings, wherein:

Fig. 1 is a top plan view of an apparatus employing my process and shows the product produced thereby;

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1;

Fig. 3 shows diagrammatically the coating operation by the units;

Fig. 4 shows a modified apparatus for practicing my process to produce a modified border.

Fig. 5 is a side elevational view, on a small scale, of an apparatus for employing my process for the manufacture of rugs;

Fig. 6 shows a strip of material partly treated in the apparatus of Fig. 5;

Fig. 7 shows a still further modification of my apparatus, and

Fig. 8 shows the production of rug repeats by the apparatus of Fig. 5 modified as shown in Fig. 7.

Before proceeding to describe my invention I will preface that the process herein disclosed contemplates among other things, the treatment of a floor covering fabric such as felt base for the production not only of bordered runners, but also for the production of rugs and as will be understood as the application is read, the process and apparatus for the production of the runner can be employed for the production of a rug by the addition thereto of one or more steps and of the apparatus for performing such step or steps, and in Fig. 1 of the drawing, I show the apparatus for producing a floor or stair runner. Upon viewing this figure, it will be observed that a material such as felt saturated with asphaltum is fed from a source of supply such as a roll (not shown) along a bed 13 in any preferred or desired manner and my apparatus, disclosed in that figure for employing my process, comprises generally a series of units, any number of which may be employed, as will be fully understood later on, and each of which is intended to so control the deposition of material upon a surface as to cause each unit or predetermined combination of units to give a predetermined ornamental effect, and the change in the units or combinations of units to vary the ornamental effects.

Each of the units comprises a member 16 which in the present disclosure, is illustrated as of a character so as to serve to hold a supply of coating material as well as to control the application of such supply to the surface to be ornamented, although as will be later understood, it is not essential to the practice of my process that the unit 16 shall serve the first aforementioned function.

The control of the application of the coating material in my present embodiment is attained by providing the member 16 with outlets 20 which are shown as formed in one of the side walls of each unit and which outlets are sufficiently numerous to provide for all contingencies as will be hereinafter understood and which when employed in my apparatus, differ from each other in the number and positioning of the effective outlets.

For the purpose of properly controlling the areas upon which the coating material is to be deposited, I employ a standard form of pan 16 all having therein a plurality of outlets 20 in one side wall thereof, preferably equi-distantly spaced and extending from one end of the pan to the other and arranged for the differential control of the feed of the material from these pans by closing any desired number of openings as by puttying, those openings that are not so obstructed then serving to feed the material.

These units 16 are each carried by shafts or rods which in the embodiment illustrated, are shown as fixedly associated therewith so that the units or pans 16 will move with the rods 21. The rods 21 are loosely carried at their opposite ends in bearings 22 in the frame of the machine and extend a substantial distance beyond these bearings for purposes that will be understood as this application is read.

In the embodiment of my apparatus for practicing my invention, illustrated in the drawings, it is intended that the quantity of material received in the pans 16 shall be such with relation to the position of the outlets 20, that the outlets will be positioned above the top level of the material when the pans 16 are in any predetermined position, such as horizontal, and that in order to cause a material to be deposited on the surface 10, it is necessary to give to the pans a movement, which is a tilting one in the illustrated embodiment. For giving the pans this outlet movement from their normal position in which raw material is fed from the pans, I show in the drawings one end of the shafts or rods 21 as squared and as receiving thereon the lower ends of the rods 23 which for this reason are each provided at such end with a square opening so that the pans will rotate with the rods so as to render them operative or inoperative and at the same time will be permitted to have a sliding movement with reference thereto. The other end of this rod 23 is connected to a control bar 24 which in the illustrated embodiment is shown as so connected to all of the pans, although here too, as will be understood arrangements can be made for differentially controlling the outlet of one or any one of the group of pans 16.

The control rod 24 is arranged to have a sliding movement at one end in the front frame 25 of the machine, and has a lost motion connection at its other end 26 to the lever 27 which is pivoted at one end to the frame as at 28 and pivoted intermediate its ends as at 29 to one end of the rod 24, as by a pin 26 working in a slot on the lever 27.

Assuming therefore that the pans 16 are all supplied with coating material which may be of the same character or which may differ in character as to color, consistency or composition, a counter-clockwise operation of the handle extension portion 32 of the lever 27 will cause the rods 23 to tilt each of the pans as shown in dotted lines in Fig. 1 of the drawing so as to bring the level of the liquid above the feed control openings 20 so as to permit the material in the

containers 16 to discharge from these outlets and down upon the surface.

As already has been explained, the surface 10 to be coated is moved continuously beneath these containers so that the discharge from each outlet 20 will in effect produce a line of coating in the direction of movement of the fabric and longitudinally thereof. The number of lines produced by each container, their position with relation to the side edges of the material and their special relationship, will be determined by the number of outlets in each unit container and their relative position in the container not only with reference to the container but also with reference to each other.

The thickness of the lines or the amount of material deposited at any one point in a line will be determined by the size of each outlet and the character of the material employed. By employing in the different pans materials which vary from each other, either as to consistency or color, a contrast can be produced between the groups of lines produced by any one predetermined container and the groups of lines produced by other containers and it will therefore be understood that by associating together different units, that is, units which have different characteristics with reference to the outlets as to their number, size and position or by varying the material controlled by the units an infinite number of contrasting lined designs can be produced.

The design thus far described is what I might term a straight line design and in order to give a graining effect such as is found in marble or in wood graining, I provide in my apparatus for a movement of the openings or outlet controls 20 at an angle to the direction of movement of the fabric 11 and as in the illustrated embodiment, these outlet controls 20 are made integral with and part of the pans 16, I attain my object by providing for a corresponding movement being given to the pan 16 in the manner which I will now describe.

On the opposite side of the frame in Fig. 1 of the drawing, I show my arrangement for automatically and predeterminedly moving the pans laterally of the direction of movement of the fabric being coated, and this comprises the shafts or pintles 80 extending from the opposite end of the pans so as to permit them to be moved transversely of the machine by cams 81 mounted upon stub shafts 82 geared to a shaft 83 as shown in the drawing and the pans being held in contact with the cams in any preferred or desired manner. Here too, I have shown the timing as being such that the pans are moved laterally in definite sequence, although as will be understood, the sequence can be changed by rotating the cams, and in fact, the cams can be adjusted so as to move all the pans as a unit. At the opposite end, I employ spiral springs 85 to hold the pintles 80 against the cams 81. It will be understood that the spring and cams can be so arranged as to hold one or more pans against any lateral movement.

The present invention is directed, among other things, to the production of a floor covering which is so ornamented as to form a runner and for this purpose is given both a ground coat and a border coat and it will therefore be understood that the apparatus thus far described and also to be hereinafter described is arranged so as to provide not only a ground coat which has the highly desirable characteristics referred to, but also a border.

Upon viewing Fig. 3 of the drawing, I illustrate here diagrammatically the arrangement for controlling the deposition of materials from the different pans so as to produce a runner effect. The first five pans on the right in Fig. 1 are those which control the application of the ground coat as will be more clearly seen upon viewing the effect produced by these deposits upon the material 10 therebelow in Fig. 1 and in Fig. 3 I show the lines of deposit produced by the three pans at the extreme right, and it will be observed that by the proper selection of the effective discharge openings of the two topmost pans in Fig. 3, the deposition of material for the purposes of the ground coat can be limited so as to leave a free uncoated border on each edge of the felt base fabric 10.

In the embodiment of Fig. 1, the last or extreme pan 16 at the left and shown in Fig. 3 as the lowermost pan has its openings so arranged that only the extreme opening or openings at each end are made effective deposition purposes, the three openings at each end being illustrated in the embodiment of Fig. 2 as being effective for purposes of the discharge of coating material and these openings are so arranged with reference to the width of the floor covering base that the material deposited thereby will be deposited on the side edges of the fabric which, as already set forth, are left uncoated by the other five pans so as to produce what in effect will be the border. The illustration of the employment of five elements or pans 16 to produce the ground coat is merely illustrative of one method of producing the field by the use of five colors, although as will be understood the number of pans may be varied, and in fact a pan may be caused to control more than one color.

While by my process thus far described, I am enabled to obtain a highly ornamental ground coat which for example may be caused to simulate marble and wood graining, yet I find that the lines of the different coating are rather too sharply defined and of too uniform a character transversely thereof to make the

simulation to marble or wood graining complete and my process further involves a treatment of the material after it has been deposited so as to eliminate the sharp definition of the lines of deposit and also to shape them off and also to cause adjacent colors to combine, and in Figs. 1 and 2 of the drawing, I employ for this purpose the knife or wiper member 40 which may be of any desired configuration, character or material and which is carried by the rod 41 mounted to have an up and down movement. For lifting the wiper or knife member 40, the rod 41 is connected at its upper end with the free end of the lever 42 so as to have a loose pivotal connection therewith, said rod or lever 42 being pivoted intermediate its ends to the top frame member 43 as shown at 44, the opposite free end 45 of the lever 42 serving as an operating handle portion. In order to cause the knife or wiper member 40 to apply sufficient pressure to the surface of the material being treated, I provide any desired number of spiral springs 46 encircling the rods carried and projecting upwardly from the wiper or knife member 40 and guided through the top frame member 43. These springs 46 abut the nuts 49 adjustably carried by the rods to give any desired pressure to the knife or wiper member 40, upon the material that is to be treated.

The knife 40 extends transversely of the direction of movement of the material 10 and is at least of a length equal to the width of the material and is positioned as will be observed upon viewing Fig. 2 of the drawing, a short distance beyond the point at which the coating material is deposited on the surface 11 by the applicator units. As the lower edge of the knife contacts with the lines of deposit, it will have what might be termed a spreading effect which will not be uniform particularly as to those lines which undulate and the result of this will be to cause these lines of coating to spread beyond their original areas of deposition and closely approximate and simulate the graining in wood or a marble effect.

One of the important features of my process resides in the fact that the character of the spreader and the weight and pressure applied thereto is so related to the character of the deposition that it has not only the smoothing effect which characterizes what is generally termed a "doctor" in this art, but also has a tendency to actually spread the material even of the non-undulating deposits beyond the areas of deposit and it is because of this operation of the spreader when employed in connection with the depositions of different colored materials in the manner set forth that I attribute in part at least the highly effective results which I attain by the employment of my process.

I have found that the use of a steel spreader such as that shown at 40, is extremely effective for the results desired. The steel knife spreads the colors evenly and thus gives to the coating a smooth even surface due to the absence of any suction such as is present when an extended surface such as an impression member is moved relatively to the coating deposited by it. In addition the spreader acts to force the paint into the floor covering material and therefore gives to the floor covering not only an ornamental coating but a highly effective wearing surface. I have further found that not only is the merging of colors almost imperceptible, but that by the employment of for instance six colors, any number of additional colors or tints can be produced.

I have found that, while the spreader 40 serves effectively for enhancing the ornamental effect of the ground coat, due to the character of its action as already hereinbefore set forth, it will cause this ground coat to spread and merge into the border and also cause the border to spread and merge into the ground coat and for the purposes of preventing this, I provide the knife 40 with the forwardly projecting members 90 which may be made of the same material as, and integral with the knife and positioned so as to register with the lines of demarcation between the side borders and the ground coat and by causing these forwardly projecting separators 90 to be properly positioned and associated with reference to the surface of the felt base product 10, a razor-like line of demarkation between the border and the ground coat can in this way be attained. In other words by the employment of the separating means of which the elements 90 are an example, I am enabled to employ my process for the simultaneous production both of the border coating and of the ground coating so as to attain the floor covering in the form of a runner and in which the two will be sharply defined and delimited.

In accordance with the apparatus of Fig. 1, the border produced is a one-color border and in Fig. 4 of the drawing, I show an apparatus in which a three color border can be produced.

This figure shows sufficient of the apparatus to bring out that I here employ three distinct units for the production of the border and each of which controls the application of one of the colors to form part of the border and which are so related to each other in their controls that the colors are deposited upon the side margins of the base fabric 10 along areas extending generally longitudinally of the strip and positioned laterally of each other and by employing in this arrangement the separators 90′, one for each color and positioned as illustrated in this figure, I produce a three color border simultaneously and also simultaneously therewith, the ground or base coat.

In Fig. 7 of the drawing, I show a still further embodiment in which I employ the apparatus of Fig. 1 modified as illustrated in Fig. 7 to produce two runners positioned laterally of each other, it being understood that the border coating produced by the outlets 20'' in the center of this strip is double the width of the border coats at the side so that when the strip is cut longitudinally midway of its width, it will provide two runner strips, each having side borders thereon. The number of separators 90'' and their position are as indicated in this figure and may be varied with the variation in the character of border which it is desired to produce.

In Fig. 5 of the drawing, I have shown in combination with the mechanism of Fig. 1 for producing the runner strip of the association therewith of mechanism for converting said runner strip into a strip of rug repeats produced complete in one continuous operation. The apparatus at the right hand of Fig. 5 is a duplicate illustrated on a smaller scale of the apparatus of Fig. 1, the strip 10 which is treated therein to form a runner as described in connection with Fig. 1 being fed therefrom as a completed runner strip which is then festooned as shown at 101 and then fed to a mash block machine comprising the mash blocks 102 arranged to impress upon the runner at equi-distantly spaced points the transverse rug border position 104 preferably extending only across the ground and terminating at the side border coating already provided on the runner strip. In order to make certain that the ground coat does not show through the border portions impressed upon the strip by the mash blocks 102, I have found it advisable to use two mash blocks which operate successively upon the same area so as to cause two border coats to be impressed thereon.

In Fig. 8 of the drawing, I show the production of strips of rug repeats, the strips being positioned laterally of each other and this as will be understood, can be attained by employing the apparatus of Fig. 7 in connection with the mash block arrangement of Fig. 5 modified so as to have the mash blocks make spaced rung border impressions positioned in between the side and central border portions on the double runner strip.

I have found that the ornamental character of the rug can be materially enhanced by producing a contrast not dependent upon either difference in color or difference in area of deposition and this I do by giving to one portion of the rug preferably the ground or body coat a dull or mat finish and to the other portion of the rug such as the border a high or glossy finish. It will be understood that the gloss finish can be produced in any desired or preferred manner as by employing a coating material which has a high vehicle content.

Where it is desired that the pans 16 shall have no movement transversely of the strip, as for instance in connection with the pans that serve to deposit the border on the strip, I have arranged for this, by means of set screws 92 which when moved into position will lock the rods 21 to the rods 23 to prevent a relative sliding movement between the two, and, where this is done, I release the corresponding cam at the opposite end of the shaft to which it is normally fixed, so that this cam is rendered inoperative.

It will be understood that my invention is particularly adaptable for the production of what is known as felt base floor coverings in which the base material employed is a saturated felt.

I have found that I can obtain very desirable results with my process by first providing the felt base fabric with a base coat of a single color such as blue, and then depositing upon such base coat varied tints of blue merging into each other as already described. In the use of a floor covering of this character the wearing away of the top coat will expose the lower coat of a similar color so that the fact that the upper coat has been worn away will not be clearly observable.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:—

1. The process of coating a material intended to form a floor covering so as to produce a floor runner, said process comprising the steps of depositing varied colored materials over the width of a strip along areas running generally in the direction of the length of the strip and then spreading those materials deposited intermediate the edges of the strip transversely of the length of the strip and preventing the deposits adjacent the edges from spreading laterally thereof and toward the opposite edge.

2. In a machine for coating a strip of material to produce a runner, said machine comprising means for moving the strip in the direction of its length, means for spatially depositing different characters of materials transversely of the length thereof and means for spreading the deposits intermediate the edges thereof and means for preventing the spreading of the material of the coating adjacent the edges toward the center of the strip.

3. In a machine for coating floor covering to produce a runner, means for depositing a coating thereon and means for spreading predetermined portions of the coating and means for preventing the spreading of the material at certain other predetermined points.

4. The process of treating a surface to produce a floor runner, said process including depositing varied character of coatings on the middle of the strip leaving the strip un-

coated by such depositing for a substantial distance from the side edges thereof and spreading said coatings over the coated areas without however spreading them to those portions of the surface which are uncoated.

5. In an apparatus of the class described, in combination, means for feeding a web or strip, means for producing a field upon the surface of said web comprising a plurality of applicator units, each associated with a predetermined character of coating material and each unit including means for controlling the deposit of material associated with its unit on areas of said web positioned laterally of each other and transversely of the web whereby upon movement of the web, the coating material associated with each unit will be deposited thereby along a plurality of lines each extending generally longitudinally of the web, with the lines of deposit positioned laterally of each other, and means for spreading the intermediate lines of deposit beyond their original area of deposit, and additional means for preventing the previously recited means from operating to spread the lines of deposit adjacent the side edges of the web and the lines of deposit inwardly thereof, into each other.

6. In an apparatus of the class described, in combination, means for feeding a web or strip, means for producing a field upon the surface of said web comprising a plurality of applicator units, each associated with a predetermined character of coating material and each unit including means for controlling the deposit of material associated with its unit on areas of said web positioned laterally of each other and transversely of the web, whereby upon movement of the web, the coating material associated with each unit will be deposited thereby along a plurality of lines each extending generally longitudinally of the web, with the lines of deposit positioned laterally of each other, the different units being petitioned in back of each other in the direction of movement of the web, and means for preventing the spreading of the deposits adjacent the edge into each other.

In witness whereof, I have signed this specification.

JOHN B. CAMPBELL.