Aug. 27, 1929. J. B. CAMPBELL 1,726,056

ORNAMENTATION PROCESS AND APPARATUS THEREFOR

Filed Oct. 17, 1925 2 Sheets-Sheet 1

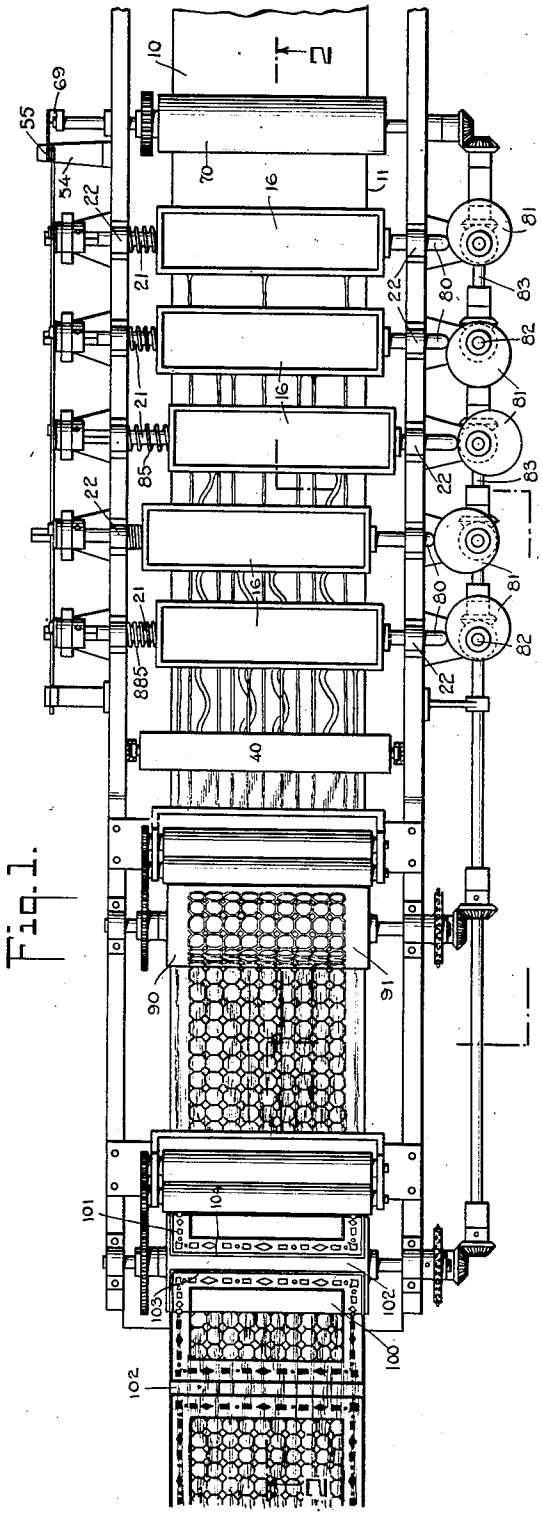


Fig. 1.

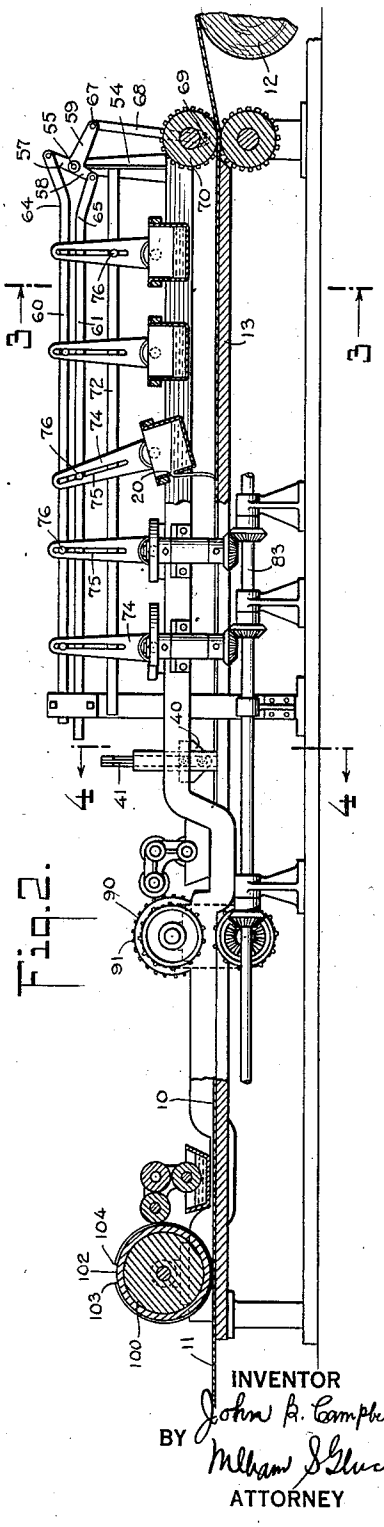


Fig. 2.

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Filed Oct. 17, 1925 2 Sheets-Sheet 2

Fig. 3.

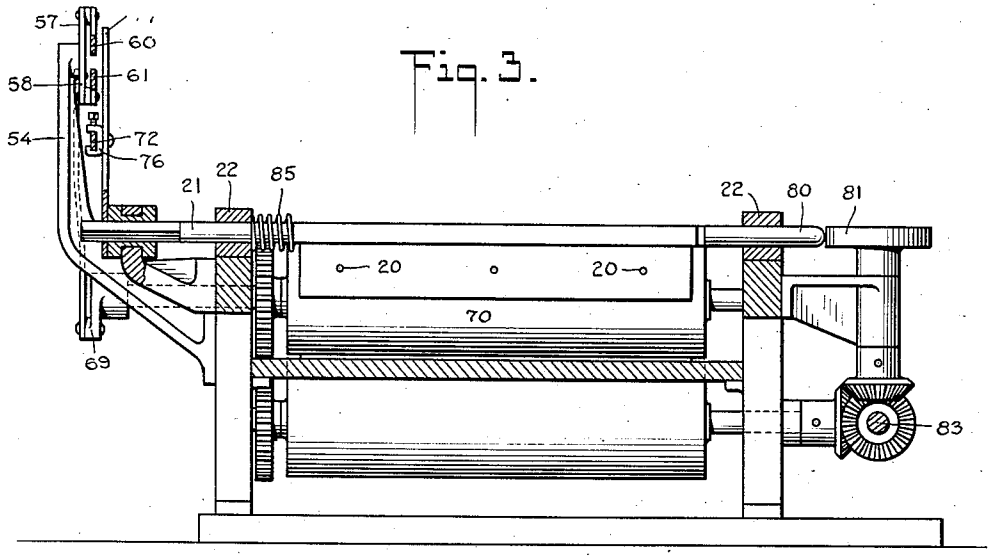


Fig. 4.

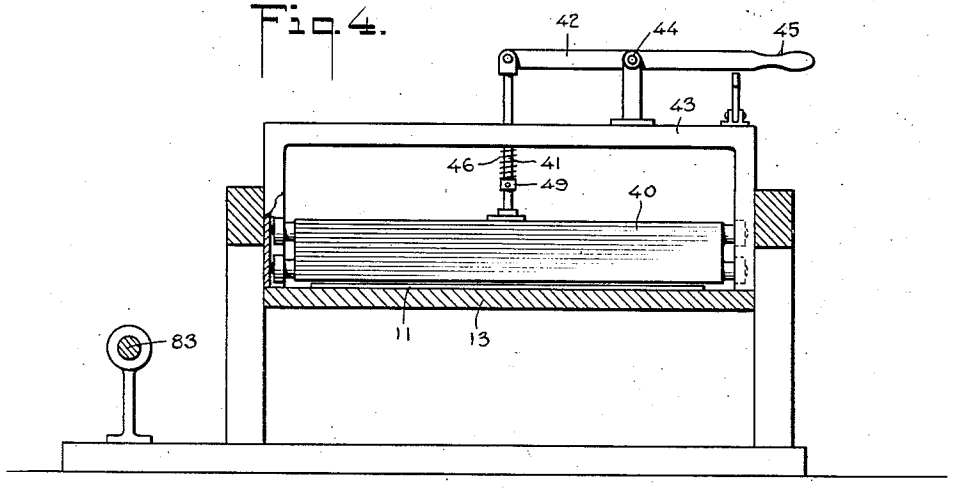
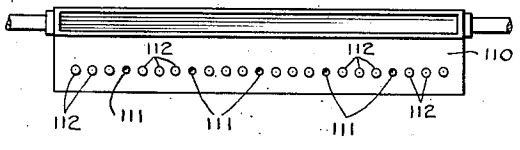


Fig. 5.



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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 October 17, 1925. Serial No. 63,048.

My present invention relates generally to coating materials and more particularly to a process and apparatus for producing a predetermined ornamental effect upon material, such as a felt base, intended to serve as a floor covering and co-ordinately involves a process and apparatus for the continuous production of rugs from a strip of such material.

While the apparatus herein illustrated and described is intended to produce a body ornamentation which simulates marble, granite or wood graining, it will be understood that as to certain phases, my invention can be employed without the production of a body ornamentation which simulates such effects.

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 marbleized 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 units each of which serves to control the application to predetermined portions 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 anly 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 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 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.

My invention further involves an arrangement whereby a surface intended as a floor covering which has been treated to give it a marbleized effect can have this marbleized effect enhanced so as to make it simulate marbleized or wood grained tiling or blocks.

A still further object of my invention is an arrangement whereby a rug border can be applied to a strip of felt base product or the like, while the strip is in motion, and my invention involves an arrangement whereby the rug border is produced by an impression member having a complete rug border impression surface thereon.

A still further object of my invention is the production of rug repeats from a strip, while the strip is in motion, 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 rug border also applied while the strip continues to move.

A still further object of my invention is the successive applications of rug body and rug border ornamentations, so that one is applied before the other is completely dry so that the disadvantages of the application of a second coat upon portions only of a coat which is already dry, will be avoided.

Another object of my invention is the production from a continuous strip of material of rug repeats by applying to the strip a continuous uninterrupted body ornamentation then superposing thereon ornamentation to not only predetermine the rug lengths but also provide the rug borders for each length.

In accordance with my invention, I first apply a rug body coating to the strip of felt base fabric, which may be uninterrupted and which may be produced by the manner already referred to above and to be more fully described hereinafter, although as will be understood this character of body coating is not essential to this phase of my invention. I then employ an impression member such as a printing roller to apply the rug border the impression member being of such a character that each operation thereof produces the impression for at least a full rug length.

My invention further involves the process and apparatus whereby the body coating applied to a strip for the production of rug repeats, shall be not only of a character but of such dimensions as to permit portions thereof to form along with the rug border proper which is separately applied, the general rug border.

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 rug repeats and in addition, involves an arrangement whereby a rug 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 for practicing my process;

Fig. 2 is a side elevational view of this embodiment taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2;

Fig. 4 is a similar section taken on line 4—4 of Fig. 2; and

Fig. 5 shows a modified embodiment of my unit.

Before proceeding to describe my invention, I will state that my process involves the treatment of a web of material such as felt base to cause a coating to be deposited thereon which coating I will term the body coating and also contemplates the application along with said coating of a second form of ornamentation which serves not only to predetermine rug lengths but also to form the border of such rugs and I will further proceed to describe process and apparatus for producing the body coating.

It will be understood however that while in the present apparatus the body coating is used as such in connection with a rug, this is

not essential as it may equally be employed in connection with the manufacture of runners, and in fact can serve as the sole ornamentation for a floor covering.

Upon viewing Fig. 1 of the drawing, it will be observed that my process is to be employed in connection with the coating of the surface 10 of any preferred or desired material 11, such as felt base floor covering, which is fed from a source of supply such as a roll 12 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 charge 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 members 16 with outlets which are shown as formed in a side wall of each unit and the units differ from each other among other ways, either in the number or the position of the outlets or both and may also differ from each other in the size of the outlets.

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 an 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, and for giving to the pans this tilting movement from their normal position in which no material is fed from the pan 16, employing the apparatus which I will now describe.

The units 16 which have been described as having extending from one end thereof the pintles or shafts 21 are mounted in the bearing frame members 22 for angular movement therein, as well as for transverse movement with reference thereto and for controlling these movements of the unit pans, I show the arrangement in detail in Fig. 2 of the drawing and which I will now describe.

Pivoted upon the standard 54 at 55 is the double bell crank lever comprising the legs 57, 58 and 59 and pivoted to the free end of the legs 57 and 58 are the slide rods 60 and 61 mounted so as to slide horizontally and longitudinally of the frame, these slide rods being bent as shown at 64 and 65 to accommodate themselves to the length of the legs 57 and 58. The leg 59 is in turn pivoted at 67 to the lever 68 oscillated by the cam 69 mounted upon and rotating with an element of the mechanism 70 which feeds the strip 10. It will therefore be understood that as the driving mechanism operates to feed the material 11 to be coated along the bed of the machine, the slide rods 60 and 61 will be oscillated back and forth in reverse directions.

Below the slide rods 60 and 61, I employ a rod 72 which is parallel to these slide rods and is fixed to the opposite ends of the frame as shown in Fig. 6.

Fixed to the shafts or pintles 21 extending from one end of the unit pans are the upwardly extending legs 74 vertically slotted as shown at 75, the slots being of length so as to straddle all three of the rods 60, 61 and 72 and in accordance with the apparatus illustrated, these legs 74 can be secured to any one of the rods by loosely passing a member such as a headed pin 76 through the slot and securing it in an preferred or desired manner to any one of the three rods and in Fig. 2 of the drawing, I show the unit pans 1, 2 and 4 counting from the left as secured to the uppermost rod 60, the intermediate unit pan 3 secured to the intermediate rod 61 and the end pan or fifth pan from the left secured to the lowermost rod 72.

In the operation of the apparatus illustrated in the drawings, as the feeding mechanism operates to feed the strip of material to be coated therealong, the double bell crank lever 55 will be oscillated synchronously therewith so as to move the slide rod 61 in one direction and the slide rod 60 in the opposite direction and due to the connection between these slide rods and pans 1, 2, 3 and 4 counting from the left, the pans 1, 2 and 4 will be oscillated in one direction while the pan 3 is being oscillated in the other direction so that in the position shown in Fig. 2

of the drawing, the intermediate or middle pan unit is in a position to discharge material upon the surface being fed, whereas the pans 1, 2 and 4 from the left are in their inoperative or vertical position and this I attain by so arranging the connection between the rod 61 and the upwardly extending legs 74 of the pans attached thereto so that when this slide rod 61 is at its extreme position to the right, which is the position shown in Fig. 2, the pin 67 will have tilted the pans connected with these legs so that the pans are in their vertical and inoperative position. In other words, these rods and the connection between them and the pan units is such that the oscillation of the unit pans is from a vertical position as shown in pan 4 from the left to a tilted position as shown in pan 3. When it is desired to render any of the pans wholly inoperative so that it will not feed at all, this pan is connected by means of a pin 76 to the fixed rod 72 which maintains it in its vertical position at all times.

The connection between the legs 74 extending upwardly from the pans is such that it can be shifted to any of the rods without trouble and inconvenience and while I have shown in Fig. 2 one of the pans as wholly inoperative and the second pan as operating reversely of the remaining three, it will be understood that any desired operative association can be attained.

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 spatial 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 naterials 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 an 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 be automatically 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.

While by my process thus far described, I am enabled to obtain highly ornamental effects which 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 shade them off and also to cause adjacent colors to combine, and in Figs. 1 and 2 of the drawing, I show 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 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.

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 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.

In accordance with my process, the unit elements which are illustrated in the apparatus of the drawing as being in the form of pans having outlets therefrom are stock units, any desired number of which can be held in reserve as supply and whenever it is desired to employ an applicator which will give a predetermined design, this can be done merely by the selection of a sufficient number of predeterminedly selected units of stock, assembling these in the apparatus such as herein disclosed. So also, when it is desired to make a colored change in the design, this can be done merely by changing the color of the material which is supplied to one or more of the units.

While the mechanism for controlling the movements of the pans disclosed herein is designed to give a marble or wood graining effect, it will be understood that the mechanism can be so designed as to give a geometrical design.

It will also be understood that while the units which I here employ are shown as in the form of pans which serve to hold a supply of the coating material, it will be understood that the units may be merely in the form of outlet controls, separated from the supply which can be held in a separate receptacle with a feeding means between the two.

The effect produced by the process and apparatus thus far described will be that of a body or ground ornamentation giving a continuous marbleized or wood graining effect and in the drawings, I have illustrated means for giving to this surface the effect of portions or blocks of wood graining and for this purpose I have illustrated the employment of an impression roller 90 carrying upon its exterior the impression faces 91 adapted to deposit or impress upon the marbleized ornamentation, attained, as already described, a further coating of material which may be of any desired character and which is shown in the drawings as intended to produce the effect of tiling although as will be understood, other effects can be attained by this same process and apparatus. By depositing this tilting coating directly upon the ground coating already deposited by the apparatus previously described, I am enabled to have the coating by the impression roller 90 deposited on the surface while the coating deposited by the pans 16 are still partly wet or in a condition where it is yieldable to pressure and I find that by this method the disadvantages of depositing a second coating upon a coating already dry is avoided and there is thus obtained by this method what in effect is a grade "A" floor covering.

As my invention contemplates that where desired, the processes and apparatus hitherto described may be employed to form rugs from a strip or web 10 by a continuous process. I provide for this, by making the impression roller 90 of such a diameter that the circumference thereof is at least equal to the length of the rug which it is desired to produce, but continue the impression surface 91 thereabout for a distance short of this full circumference so that the ends of these impression surfaces 91 are spaced apart a predetermined distance and furthermore, have the side edges of the impression surfaces 91 terminate so as to leave the side portions of the already coated fabric 10 free of any coating by the impression surfaces 91. This arrangement, I am enabled by one full impression of the roller to produce a tiling effect which suffices for the ground or body of a rug and allow uncovered areas between the repeats by the impression roller 91 and also along the side edges of the strip 10 for purposes that will shortly be understood.

For completing the rug ornamentation I show at 100 a second impression roller which has thereon the impression surfaces 101 outlining a complete rug border and here, too, the roller is preferably made of a circumference at least equal to the full length of the

rug which it is desired to produce. In the illustrated embodiment I have however shown this roller 100 as greater in circumference than the full length of the rug which it is desired to produce so as to provide for the spacing 102 between the rugs. Where the circumference of the roller 100 is substantially equal to the length of the rug which it is desired to produce, I make the impression surfaces 101 continued thereabout for this full cricumference so that the edges 103 and 104 contact and merge, but where as in the illustrated embodiment, the roller 100 is of greater circumference than the rug length, the impression surfaces 101 do not continue about the roller for its full circumference but fall short thereof a space being provided between the ends 103 and 104 as shown in Fig. 1 so as to produce the spacing 102 between the rollers. It will be understood that the rug border is deposited on portions of the surface not covered by the tile coating.

While the invention herein described, discloses the pans 16 as differing from each other by the number and the spatial relationship of the outlets, it will be understood that I can employ a standard form of pan having thereacross a maximum number of outlets, those of which it is desired not to use being plugged in any desired manner as by putty and in Fig. 5 of the drawing, I show a pan of this character in which there are arranged across the full width of the pan a great number of equi-distantly spaced outlets 111, and in this figure of the drawing, it will be observed that a great number of these are plugged so that only those numbered 112 act as discharge outlets. By this method, assuming that eight pans are the maximum number desired to be employed at any one time, only eight pans will be necessary to be kept in stock and the variation in effect which it is desired to attain can be had by plugging predetermined holes in each pan.

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 applied by the pressure roller 100 a high or glossy finish. This difference in finish I find can be attained by employing for the former a coating material having a granular or high wearing characteristic and which will be forcibly impressed in the yieldable felt base. 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.

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 making an ornamental floor covering which comprises feeding a web of saturated felt-base material, flowing upon the surface thereof a plurality of streams of differently colored body coating material, said streams being laterally displaced one from another, and being moved relatively to each other and to the web, blending said streams upon said surface to form a ground coating therefor, and while said coating is still wet, and during a continuation of the motion of said web, impressing thereon a body ornamentation and the border designs of rug repeats.

2. The process of making an ornamental floor covering which comprises feeding a web of saturated felt-base material, body coating the surface thereof, flowing upon said body coating while still wet a plurality of streams of differently colored coating material, said streams being laterally displaced one from another, and being moved relatively to each other and to the web, blending said streams upon said surface to form an ornamental ground coating therefor, and while said coating is still wet and during a continuation of the motion of said web, impressing thereon a body ornamentation and the border designs of rug repeats.

3. An apparatus for producing rugs from a saturated felt web comprising means for feeding said web, a plurality of means for applying interspaced streams of differently colored body coating materials thereon, means for controlling the flow of said streams; means for moving said streams relatively to each other and to the web; means for blending the ground coating produced thereby over the entire surface of said web, and means for continuously impressing upon said coating a body ornamentation and the border designs of rug repeats.

4. An apparatus for producing rugs from a saturated felt web comprising means for feeding said web, a plurality of color-feeding devices positioned above said web and adapted to deposit thereon interspaced streams of differently-colored bodying-coating material. means for oscillating said color-feeding devices transversely of the web, means for controlling the flow of said color-feeding devices, means for blending the ground coating produced thereby over the entire surface of said web, and means for continuously impressing upon said coating a body ornamentation and the border designs of rug repeats.

In witness whereof, I have signed this specification.

JOHN B. CAMPBELL.