Aug. 19, 1941. C. J. DAVIES 2,252,704

DECORATION

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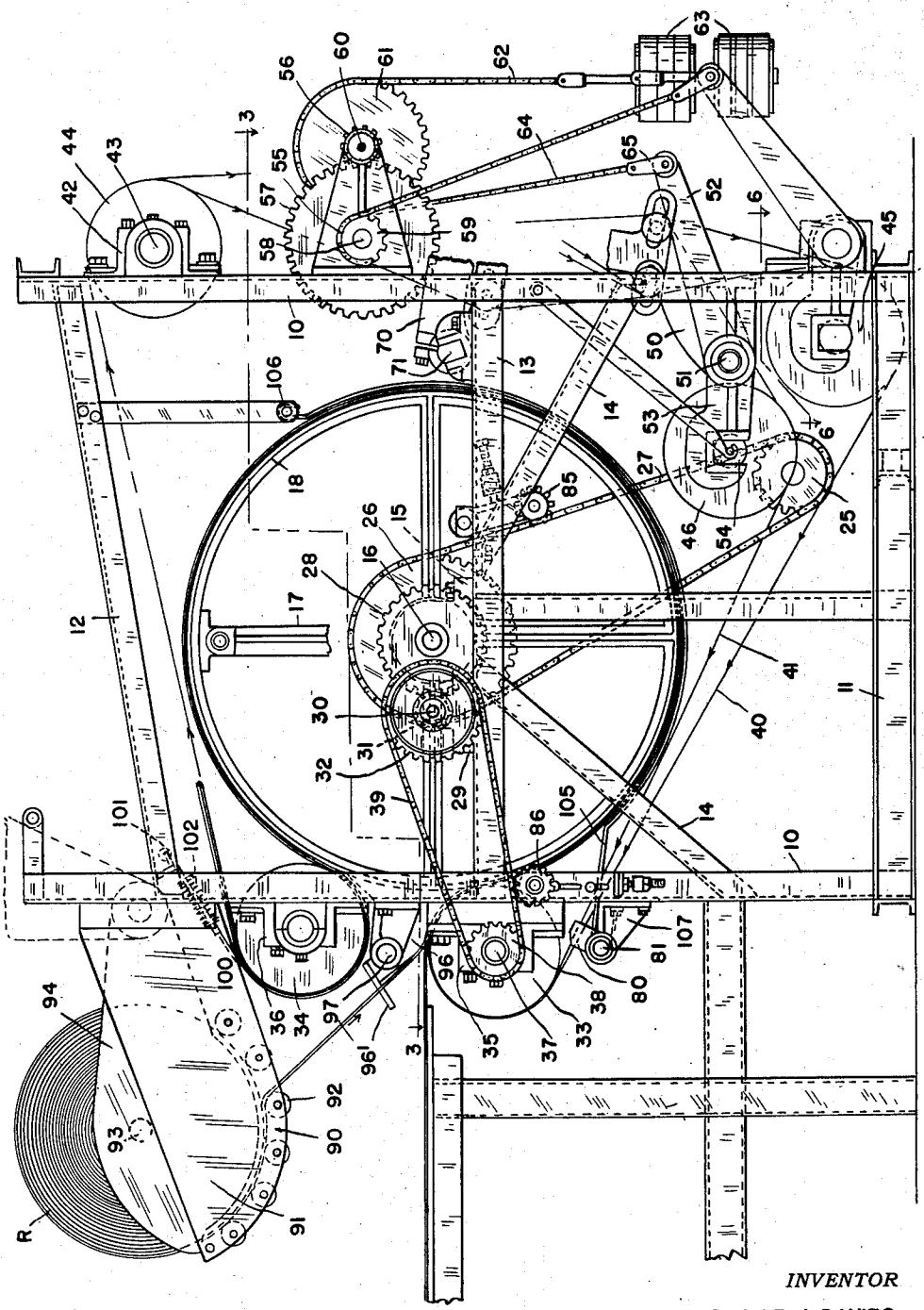


FIG. 1.

INVENTOR

CLARENCE J. DAVIES

BY Whittemore, Hulbert & Belknap

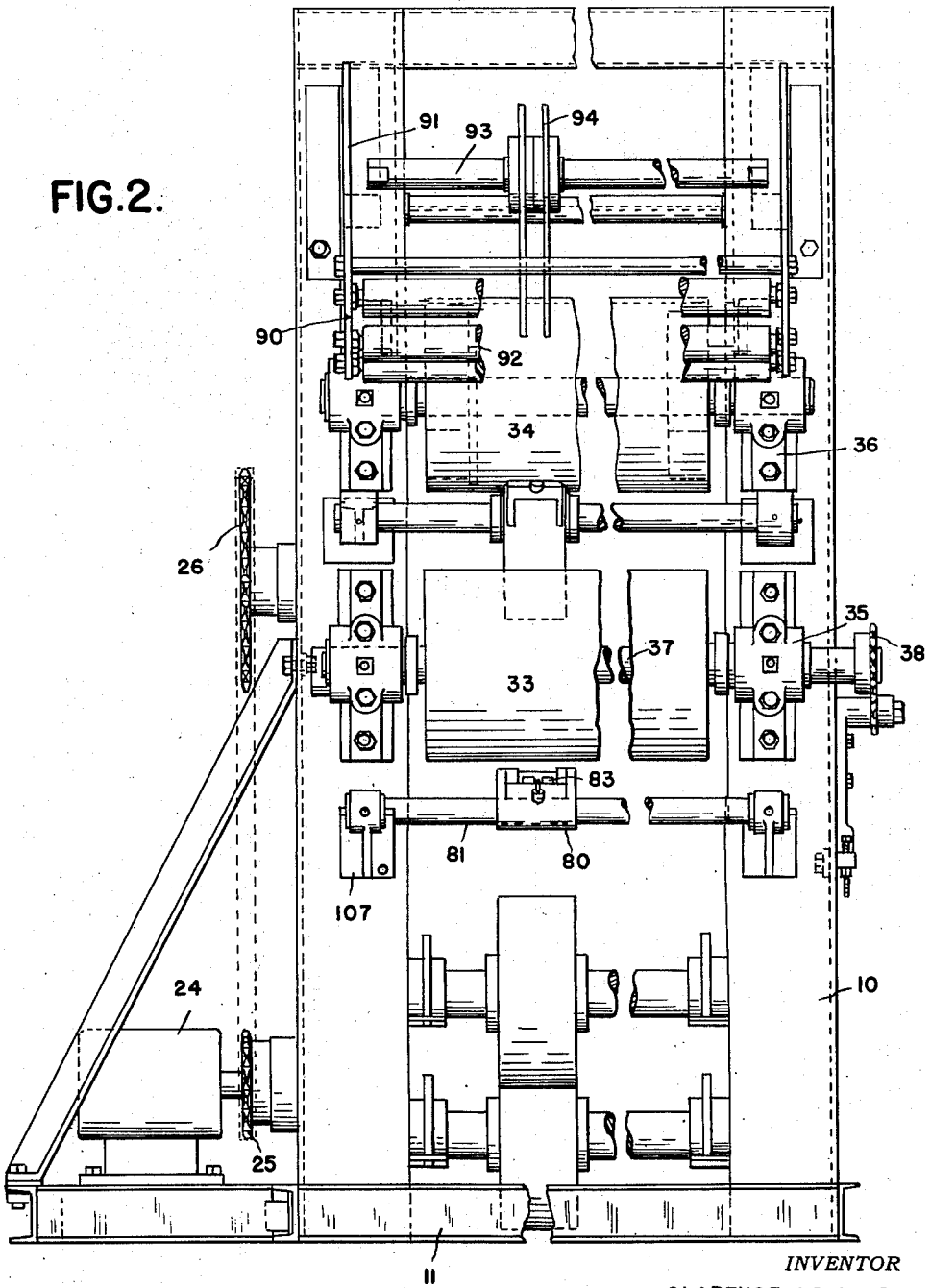
ATTORNEYS

Aug. 19, 1941. C. J. DAVIES 2,252,704

DECORATION

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FIG.2.



INVENTOR
CLARENCE J. DAVIES
BY
Whittemore, Hulbert & Belknap
ATTORNEYS

Aug. 19, 1941. C. J. DAVIES 2,252,704

DECORATION

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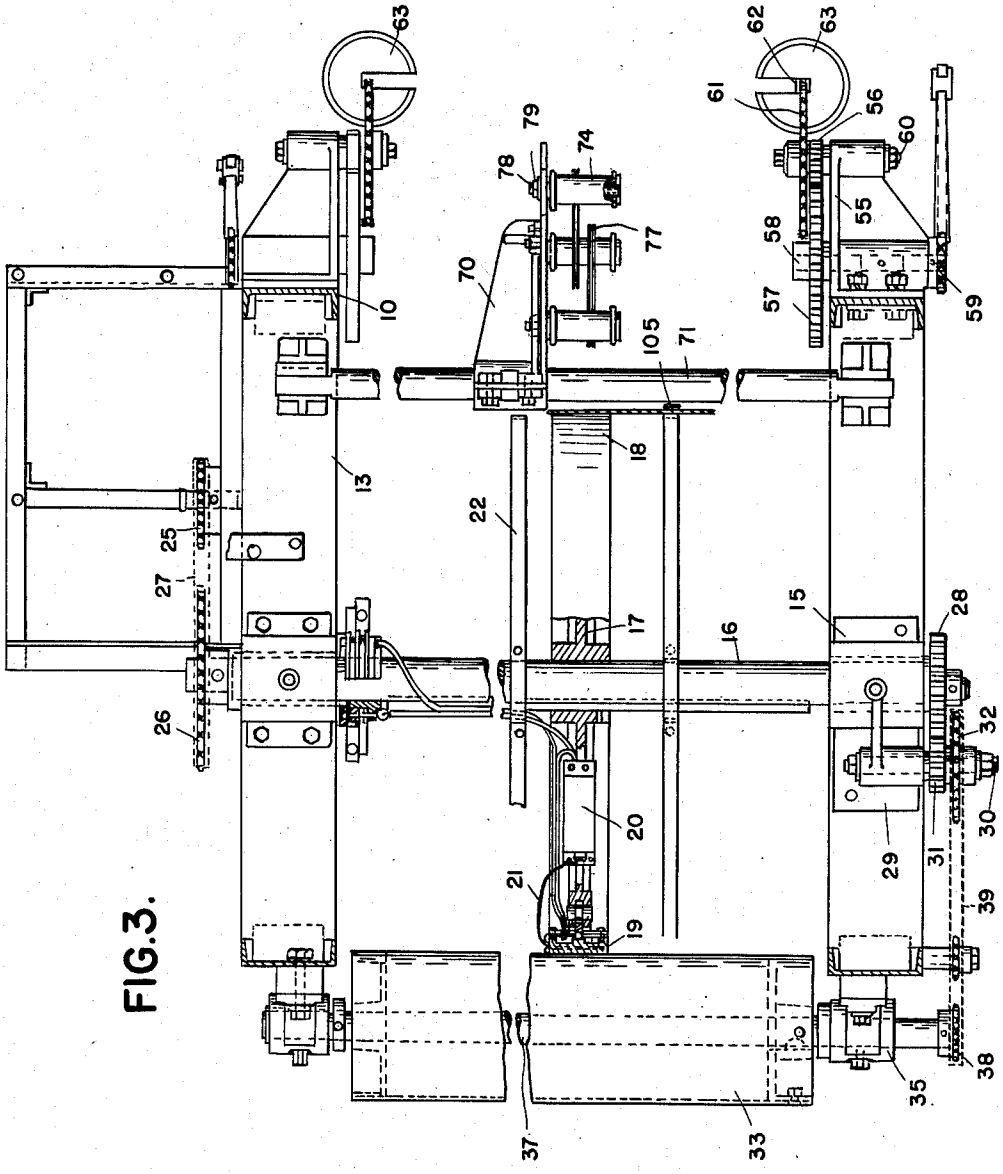


FIG.3.

INVENTOR
CLARENCE J. DAVIES
BY
Whittemore, Hulbert & Belknap
ATTORNEYS

Aug. 19, 1941. C. J. DAVIES 2,252,704

DECORATION

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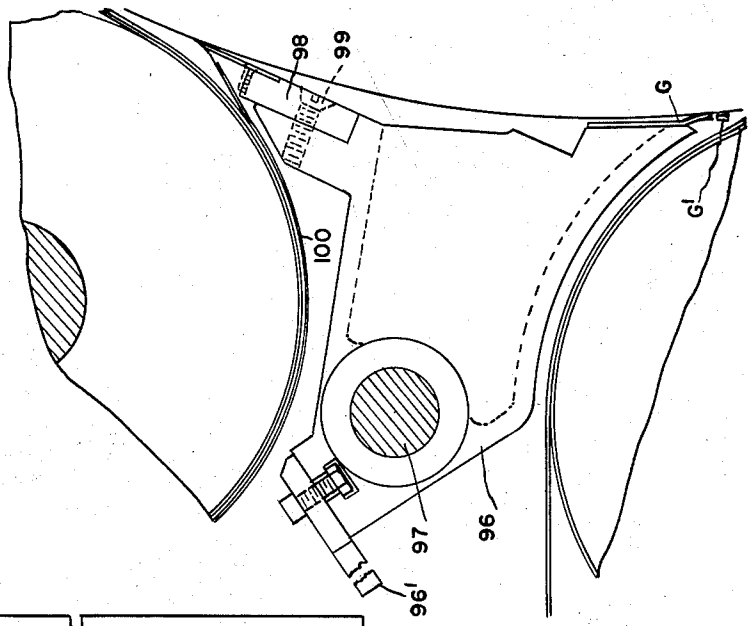
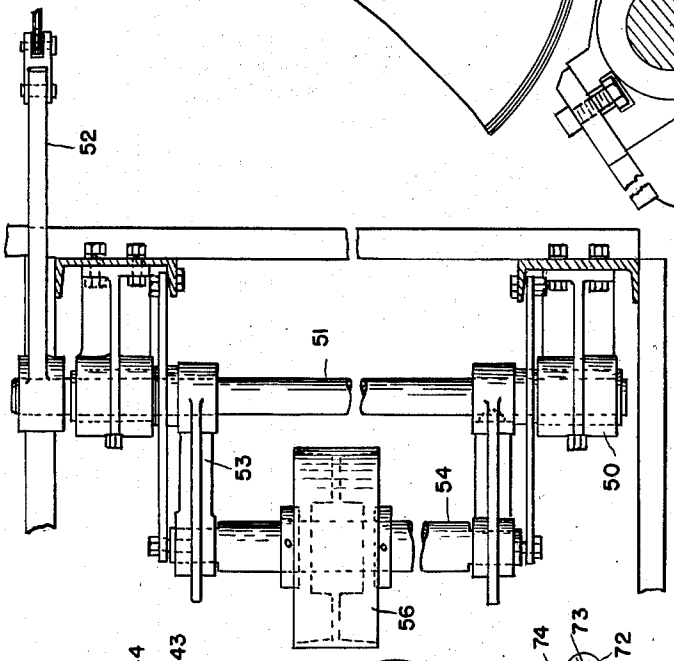


FIG.5.



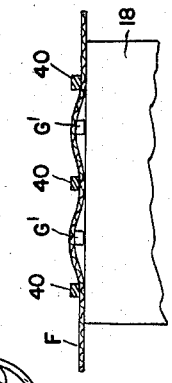


FIG.6.

FIG.5A.

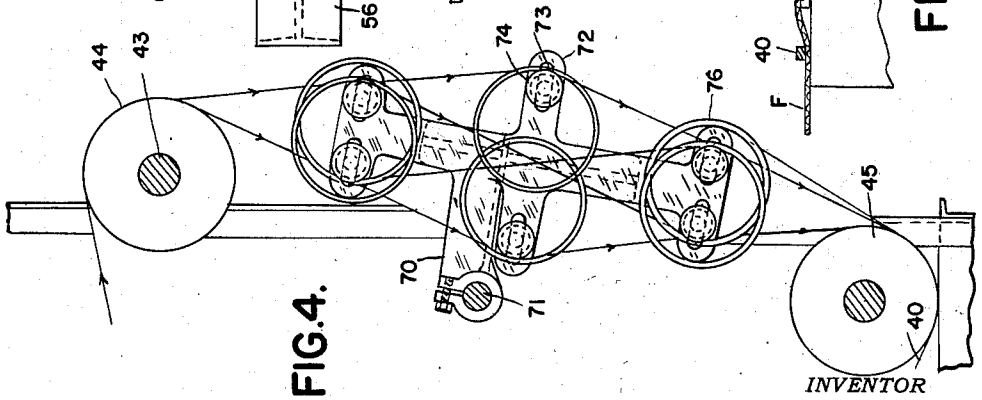


FIG.4.

INVENTOR
CLARENCE J. DAVIES
BY
Whittemore, Hulbert & Belknap
ATTORNEYS

Aug. 19, 1941. C. J. DAVIES 2,252,704

DECORATION

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FIG.7.

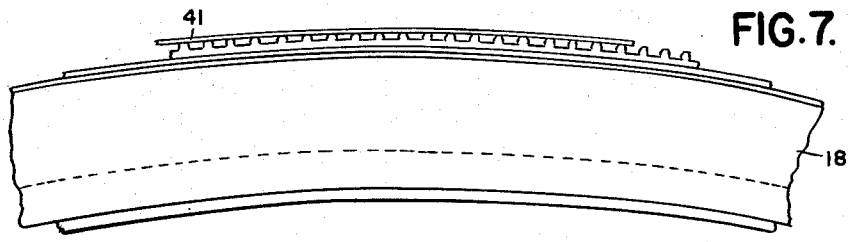


FIG.8.

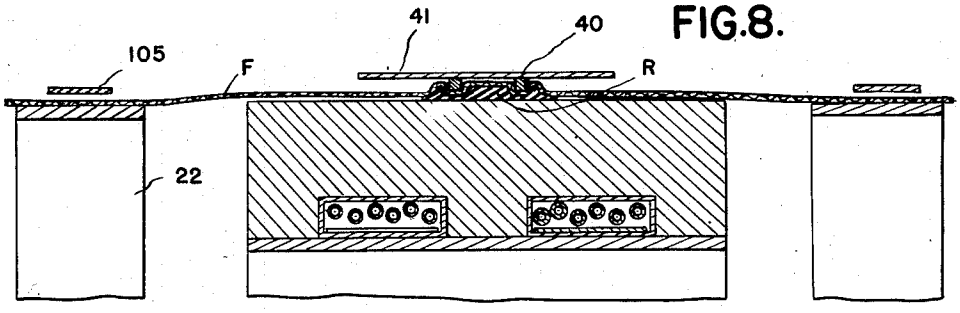


FIG.9.

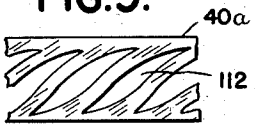


FIG.10.

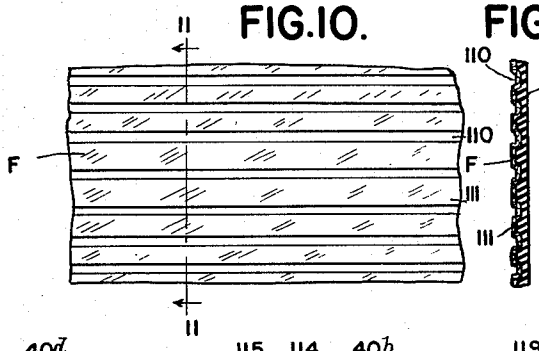


FIG.11.

FIG.12.

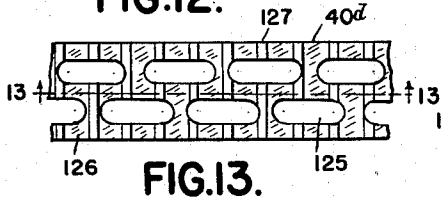


FIG.13.

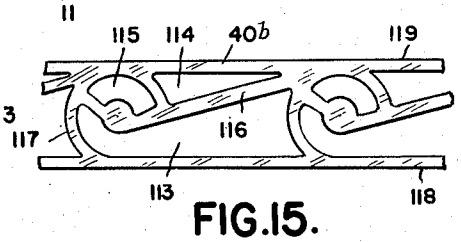


FIG.15.

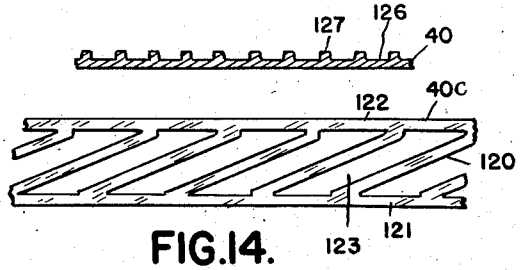


FIG.14.

INVENTOR
CLARENCE J. DAVIES
BY
Whittemore, Hulbert & Belknap
ATTORNEYS

Patented Aug. 19, 1941 2,252,704

UNITED STATES PATENT OFFICE

2,252,704

DECORATION

Clarence J. Davies, Detroit, Mich., assignor to National Automotive Fibres, Inc., Detroit, Mich., a corporation of Delaware

Application December 12, 1938, Serial No. 245,330

12 Claims. (Cl. 154—1)

This invention relates to the manufacture of decorated sheet material and more particularly to the formation of a design in relief in fabric.

According to the teachings of the present invention sheet material, such for example as upholstery fabric, leather, artificial leather, or the like, is advanced toward a heated roll of relatively large diameter. A strip of deformable form retaining material is advanced simultaneously with the advancing sheet material. Preferably the strip material is an uncured rubberous composition. The sheet material and the strip material are brought into engagement and continue to advance together into engagement with a heated roll. At the same time one or more forming bands are brought into engagement with the heated roll with the sheet material and the strip material interposed.

Preferably the arrangement is such that the strip material engages the heated roll directly. The sheet material overlies the strip material and the band engages the forward or dress face of the sheet material. If desired, in order to apply greater pressure and to provide in combination with certain forms of forming bands a closed die formation, a pressure band may engage the outer surface of the forming bands and press the same firmly against the sheet material.

The temperature of the heated roll is maintained at a desired point, and the speed of the roll is selected, such that upon a predetermined rotation thereof the strip material will have been deformed permanently into a desired formation and have been permanently united as by vulcanization to the sheet material.

It is accordingly an object of the present invention to provide means and method for continuously decorating sheet material.

It is a further object of the present invention to provide a means and method for imparting a design in relief to the dress face of a sheet material, such as fabric or the like.

It is a further object of the present invention to provide a means and method for accelerating the manufacture of decorated fabric.

Other objects of the invention will be apparent as the description proceeds and when taken in conjunction with the accompanying drawings, and wherein:

Fig. 1 is a side elevation of the improved machine;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a section on the line 3—3, Fig. 1;

Fig. 4 is a detail side elevation of the band tension adjustment means;

Fig. 5 is a detail showing the stripper attachment;

Fig. 5A is a schematic view showing forming the cloth;

Fig. 6 is a fragmentary section on the line 6—6, Fig. 1;

Fig. 7 is a fragmentary elevation showing the coaction between the roll, the forming band and the pressure band;

Fig. 8 is a fragmentary radial section through the periphery of the roll and associated parts;

Fig. 9 is a fragmentary elevation showing one design of forming band;

Fig. 10 is a fragmentary elevation of a decorated fabric;

Fig. 11 is a section on the line 11—11, Fig. 10;

Figs. 12, 14 and 15 are fragmentary elevations showing illustrative designs for forming bands; and

Fig. 13 is a section on the line 13—13, Fig. 12.

In order to carry out my invention, I provide a machine in which a plurality of vertical frame members 10 are supported from a base 11 and are interconnected at the top by cross braces 12. Intermediate the top and bottom of frame members 10 are provided horizontal frame members 13 suitably braced by struts 14.

Journalled in suitable supports 15 carried by frame members 13 is a roll supporting shaft 16 to which is secured by spokes 17 a roll 18.

The roll 18 is of any suitable material and may, if desired, be formed of metal. The roll 18 has a plurality of circumferentially spaced heating elements indicated generally at 19, (Fig. 5). These heating elements are preferably electric resistance elements, and in order to maintain the temperature of the roll within predetermined limits I provide a thermostatic control switch 20 which is adapted to control the current to the heating element 19 in accordance with the temperature of the roll. The thermostatic control switch 20 may be actuated by a thermostatic fluid, and for this purpose a conduit 21 interconnects switch 20 and a suitable fluid containing bulb received within the heating element.

As best seen in Fig. 3, the roll 18 is relatively narrow. Since the present machine is intended and adapted for use in decorating relatively wide strips of fabric, I prefer to provide auxiliary ring members 22 spaced axially from the roll 18. Rings 22 serve merely to support the edges

of the fabric or other sheet material as it is carried around by the roll 18.

A motor 24 is carried by the base 11 and is adapted to rotate a driving sprocket 25. The shaft 16 has keyed or otherwise secured thereto in driving relation a sprocket 26. A driving chain 27 interconnects sprockets 25 and 26 and serves to rotate shaft 16 and therefore heating roll 18. As best seen in Fig. 1, the shaft 16 has keyed or otherwise secured thereto a gear 28. Journalled for rotation in suitable brackets 29 is a second shaft 30 which carries a gear 31 and sprocket 32. Gear 31 is adapted to mesh with and be driven by gear 28.

At the front of the machine I provide a pair of rolls 33 and 34. These rolls are suitably journalled in supports 35 and 36, respectively, and are adapted to serve a purpose which will later appear. The roll 33 is carried by a shaft 37 which has keyed or otherwise secured thereto a driving sprocket 38. A chain 39 interconnects sprockets 38 and 32. It is therefore apparent that rotation of the motor 24 drives the heating roll 18 and the roll 33 in timed relation. The gear ratios involved are such that the peripheral speed of the heating element 18 and of roll 33 are the same.

One or more endless forming bands 40 are provided and are adapted to pass over roll 33 and thence into engagement with the heating roll 18. The band or bands 40 are then led around the roll 34 and around a plurality of other rolls which will subsequently be described in detail. If desired, a pressure band 41 may also be provided, the arrangement between the bands 40 and 41 being such that the band 40 is received between the band 41 and the heating roll 18. By properly tensioning the band 41 a relatively great pressure between the band 40 and the heating roll 18 may be obtained without subjecting the forming band 40 to excessive tension.

In order to adjust the tension of the bands just referred to, I provide the following arrangement of parts: Carried by the rear frame member 10 is a bracket 42 in which is journalled a shaft 43 supporting a fixed roll 44. Adjacent the roll portion of the rear frame member 10 I provide a pair of adjustable tensioning rolls 45 and 46. Since the operation of these rolls is identical, only one will be described in detail.

A bracket 50 is carried by the lower portion of the rear frame member 10 and rotatably supports a shaft 51. The shaft 51 has keyed or otherwise secured thereto a lever 52, as shown in Figs. 1 and 6. The shaft 51 also carries a pair of arms 53 which are keyed or otherwise nonrotatably secured thereto. The arms 53 at their free end rotatably support a shaft 54 to which the roll 46 previously referred to is secured. As will be apparent from Fig. 1, if a force is applied upwardly or in a counterclockwise direction to the lever 52 the roll 46 will be forced downwardly against the band which passes thereover thus increasing the tension of the band.

In order to apply a predetermined force to the lever 52 and hence to the roll 46 I provide a bracket 55 which rotatably supports a gear 56 meshing with a larger gear 57. The gear 57 is carried by a shaft 58 which in turn carries a substantially smaller multiplying sprocket 59.

The gear 56 is carried by a shaft 60 which in turn carries in driving relation a larger sprocket 61. A chain 62 has one end secured to the periphery of the sprocket 61 and leads thereover as shown in Fig. 1 having a free end depending from the sprocket 61. The chain 62 at its lower end is provided with means for supporting weights 63.

A second length of chain 64 is provided having one end secured to the small sprocket 59 and having a depending portion pivotally connected to the lever 52 as indicated at 65.

It will be apparent that the construction just described provides for the application of a predetermined force to the roll 46. The weights 63 tend to rotate the sprocket 61 and rotation of the sprocket 61 through the intermeshing action of gears 56 and 57 tends to rotate the sprocket 59 in a direction to raise the lever 52 or to rotate the same in a counterclockwise direction. As will be evident from Fig. 1 the gear ratios are such that substantial multiplication of force applied by the weights 63 is accomplished.

As previously stated, the mechanism for applying a force through the roll 45 is substantially identical.

It is contemplated that one or more forming bands 40 may be employed. For example, if desired a plurality of narrow bands may be provided which will be adapted to form a plurality of depressions and intermediate ribs or ridges of predetermined spacing in the finished fabric. It will therefore be understood that a plurality of forming bands may if desired be employed. It is of course desirable that these bands be independently adjustable to compensate for slight variations in length. For this purpose I provide mechanism best illustrated in Fig. 4.

A bracket 70 is supported from a transverse bar 71 which in turn is carried by the horizontal frame members 13 as shown in Fig. 1. The bracket 70 is provided with a plurality of arms 72, each of which is in turn provided with an elongated slot 73. Adjustably supported in the slot 73 are rollers 74 over which the various bands may be led in criss-cross relation as shown in Fig. 6. As will be apparent, the bands are separated by different means and may be individually adjusted by adjustment of the corresponding rolls 74.

In Fig. 4 I have illustrated means to prevent abrupt flexing of the bands. These means take the form of relatively large rings 76 which are provided with flanges 77 at their edges as shown in Fig. 3. The bands are received between the flanges 77 and serve to retain rings 76 against rollers 74. Due to the relatively large diameter of the rings 76 the bands are flexed or bent to a much larger radius as would be the case if they were led directly over rollers 74.

As shown in Fig. 3 the rollers 74 are rotatably supported on spindles 78 which are threaded at one end and are adapted to be clamped in adjusted position in slot 73 by nuts 79.

A shown in Figs. 1 and 2 a guide 80 is supported on a shaft 81 which is carried by brackets 107 on upright frame members 10. The guide 80 has openings 83 formed therein to provide a passage for forming bands 40. It will be appreciated that the guide 80 will be arranged to suitably position the desired number of forming bands 40. In the embodiment illustrated, a pair of apertures 83 are provided for passage of two forming bands. I provide adjustable idler sprockets 85 and 86, shown in Fig. 1, for the purpose of properly adjusting tension of the driving chains 27 and 39, respectively.

Carried by the forward upright frame members 10 and projecting forwardly thereof I provide a

support 90 for the strip material. As shown in Figs. 1 and 2, the support 90 comprises a pair of brackets 91 carried by opposite frame members 10. Brackets 91 carry a plurality of rotatable rollers 92 on which the roll of strip material is supported. It is contemplated that the strip material will be withdrawn from the roll by the means for directly feeding or rotating the roll. For this purpose rollers 92 are provided which support the roll for free rotation and facilitate ready withdrawal of the strip material.

In addition guiding means are provided which take the form of a transverse rod 93 on which are adjustably supported a pair of plates 94 which retain the roll of strip material in predetermined lateral position.

Means are provided for insuring that the completed decorated article will be removed from the roll, and this means takes the form of a stripper member 96, shown in detail in Fig. 5. Stripper member 96 is adjustably supported on a transverse shaft 97 which is supported from the vertical frame members 10. Stripper member 96 is provided with a detachable and replaceable blade 98 which is secured to the body of the stripper 96 as by bolts or the like 99. The blade 98 is adapted to be adjusted into substantially tangent position to the heating roll 18. This will insure that as the advance edge of each completed sheet of fabric or other sheet material reaches the blade 98 it will be stripped from the heating roll and will be fed outwardly. In addition means are provided to insure that the completed fabric shall be led over the upper roll 34. This means takes the form of a tape 100 secured at one end to the stripper 96 and hooked to the frame of the machine as indicated at 101. Preferably a tension spring 102 is provided to cause the tape 100 to bear lightly against the roll 34.

In addition I provide other tapes 105 (see Figs. 1 and 3). Tapes 105 are hooked or otherwise secured to the frame as indicated at 106 and are adapted to underlie the guide rings 22 previously referred to. The opposite end of the tape 105 is secured to a rod 81 carried by the uprights 10 at the front of the machine. The function of the tape 105 is to guide the lateral portions of the fabric material as the central portion is engaged by the heating roll 18. If preferred, driven bands cooperating with rings 22 may be provided, as is apparent.

Means are provided to insure accurate registry between the strip material R and the forming and pressure bands 40 and 41. This takes the form of adjustable guide elements 96' carried by the stripper element 96. The bands 40 and 41 as previously described are accurately guided into proper position on the roll 33 by means of the guide 80. As a result accurate registry between the strip material and the bands is obtained.

Means may also be provided to form some fullness in the cloth before it is clamped against roll 18. In Figs. 5 and 5A I have shown a former G carried by stripper 96, and having resilient wires or the like G' adapted to depress the cloth between forming bands 40. In Fig. 5A I have indicated the arrangement of these former wires G'. It will be understood that they are stationary, and terminate at a point short of where the fabric and forming bands 40 engage roll 18.

The provision of this former to provide fullness in the fabric as it is advanced into contact with the heated roll is particularly valuable where a blowing rubber is employed. Thus, for example, I have found that I may employ a substantially thinner strip of rubberous material, which is of the type known as blowing rubber, and is well known in the art. This rubber, when heated, expands substantially and forms a spongy or porous rubber. By the provision of my forming wire G', I provide fullness into which this rubber may expand. I am thus enabled to provide substantially higher beads than would otherwise be the case.

It is also advisable in certain instances to provide the corners of the heating roll with insulating inserts. This tends to prevent scorching of the fabric which might otherwise occur in case dangerous high temperatures are employed on the heating roll or in the event of stoppage of the roll for any purpose. I have not considered it necessary to illustrate such inserts since they may be curved blocks of suitable heating insulating material detachably supported in the peripheral edges of the roll in a manner which will be obvious.

In Figs. 7 and 8 I have shown on an enlarged scale the coaction between the heating roll 18, the fabric and rubberous material, the forming bands 40, pressure band 41, guide rings 22 and guide strips 105. As best seen in Fig. 8, the strip of rubberous material R is adapted to abut directly against the outer surface of the heated roll 18. The sheet material, which is shown in this embodiment as a fabric F, overlies the rubberous material R and, as shown, is engaged laterally from the portion to be decorated between guide rings 22 and guide strips 105. Forming bands 40 as shown in Fig. 8 deform the fabric and rubber so as to provide a design in relief thereon. As shown in this figure, the rubberous material forces the fabric outwardly at the sides of the forming bands. Due to application of heat and pressure the rubberous material is permanently bonded as by vulcanization to the fabric.

In certain instances the forming bands may be relatively small, or as subsequently described they may be substantially weakened by apertures formed therein. It is therefore preferable in many cases to provide a substantially stronger pressure band 41 which engages the outer side of the forming bands 40. It will be appreciated that the pressure band 41 and the circumference of the heating roll 18 all have the same linear velocity so that when the fabric and rubberous material is engaged between the bands and the roll no slippage will occur.

In Figs. 10 and 11 I have indicated the final appearance of a fabric decorated according to the present method. The fabric F in this case is provided with a plurality of parallel spaced grooves or depressions 110. Intermediate the grooves or depressions 110 the material extends outwardly to form a bead 111. I have shown the fabric in this instance as provided with a large number of beads, but it will be appreciated that if desired a single bead or two beads may be provided.

In Fig. 9 I have indicated a fragment of a forming band of a different character. In this instance the band 40*a* is provided with a plurality of apertures 112 of the shape shown. It will be appreciated that the band 40*a* will produce beads or riser elements projecting above the plane of the decorated cloth corresponding to the apertures 112. If desired such a band may be used in combination with a pair of narrow bands such as shown at 40 in Fig. 8, spaced slightly from the edges of band 40*a*. As will be readily appreciated, this will produce parallel spaced beads

and an intermediate design corresponding to the apertures 112. In Fig. 15 I have indicated a somewhat different design of forming band 40b. This band has irregular cut-out portions 113, 114 and 115 leaving irregular portions 116, 117 interconnecting two parallel bands 118 and 119. As will be readily understood the portions 116, 117 in this instance require the concurrent use of a pressure band to retain the elements of the forming band in good contact with the material.

In Fig. 14 I have illustrated a somewhat different design of forming band 40c in which diagonal bars 120 interconnect parallel bands 121, 122, thus providing intermediate diagonal apertures 123.

It will be appreciated that the designs illustrated are not intended to be limiting but that any fanciful or arbitrary design may be adopted. In cases where a pressure band is employed it is essential that the forming band be of substantial thickness. This is for the reason that the pressure band closes any apertures which may be provided in the forming band, thus forming an effect of closed dies. The height of the beads formed in such case will therefore depend on the thickness of the forming bands. It has been found that when forming bands are made of substantial thickness and are weakened as for example by apertures as indicated in Figs. 14 and 15, the bands have a tendency to break after prolonged use. This tendency to break is avoided in large part by use of the enlarged rings previously referred to, but it is felt desirable in some cases to modify the construction of the bands themselves. In Figs. 12 and 13 I have illustrated a band 40d made according to the present invention and such a band is illustrated in Fig. 7 in combination with the pressure band 41. The band 40d is provided with a plurality of apertures 125. In the present instance the apertures 125 are shown as provided in parallel rows and in individually staggered relation. In order to provide for increased flexibility of the forming band 40d and at the same time to retain its effective thickness in use, I have removed material to form slots at 126 leaving a plurality of ribs 127 extending transversely across the band 40d. The band is therefore of substantially reduced thickness at the slots 126 and is accordingly much more flexible. At the same time, as indicated in Fig. 7, the pressure band 41 engages the tops of the ribs 127 and presses the forming band 40d firmly against the material to be decorated.

In case no pressure band is employed, it will be appreciated that the rubberous material deformed outwardly from apertures in the forming band or adjacent the edges of a single continuous band, such as shown in Fig. 8 at 40, will be rounded. This is because the rubberous material as subjected to heat and pressure is caused to flow outwardly and the fabric serves as a flexible wall retaining and molding the same into a bead formation. In a proper instance where, for example, the rubberous material is of relatively great thickness or where it is provided in the form of a blowing composition, the bead or riser may extend substantially above the top of the forming band.

In some instances, however, it is preferred to employ the pressure band to obtain a double function. Its function as a means to press the forming bands 40 firmly against the heated roll 18 has previously been described. By referring to Fig. 8, its second function will be apparent. In this figure the pressure band 41 is shown as engaging the tops of a pair of relatively closely spaced forming bands 40. It will be appreciated that the forming bands 40 and pressure band 41 thus form a closed die member. If the material R is in the form of a blowing rubberous composition which when heated will expand substantially and form when vulcanized a spongy material, the bead formed intermediate the bands 40 may be provided with substantially sharp corners in the portions corresponding to the point of juncture between the bands 40 and 41.

In some instances where the pressure band is employed this sharp angled bead is not desirable and in such case it is necessary only to provide the forming bands of a height sufficient to insure that the pressure band 41 will at all times be spaced above the top of the bead formation as it is formed.

I have illustrated the forming bands as extending substantially perpendicular to the axis of the roll 18, but it will be appreciated that decorations may be imparted to the material in a diagonal path by a proper design of forming band. In addition, if desired, the decorations imparted need not be continuous. This continuity of decoration may be obtained by providing relatively wide, smooth portions on the forming band. Since the unit pressure of the forming band on the deformable material, such as the rubber R, depends upon the width of the band, it will be appreciated that where the forming band is of several times the width of its forming portion it will not substantially deform the deformable material.

I have illustrated a single heating roll, but it will be appreciated that if desired a plurality of heating rolls and cooperating elements may be employed to decorate a plurality of bands across the material. A similar result may be obtained by providing a roll 18 which is substantially wider than that shown in Fig. 1.

From the foregoing it is believed that the operation of the present machine and the practice of the present method is obvious. Briefly reviewed, however, the operation is as follows: The heating elements 19 are energized by suitable circuit control means (not shown) and heating roll 18 is brought up to temperature. This temperature is preferably maintained within predetermined accurately controlled limits by a thermostat switch 20. At this time the motor 24 may be started, which will result in a slow rotation of the heating roll 18 and a corresponding rotation of the feed and guide roll 33. United fabrics or a continuous strip of fabric is introduced into the front of the machine, passing over the roll 33 and over the forming and pressure bands 40 and 41 on the roll 33. At the same time strip material such as an uncured rubberous composition is introduced beneath the guide portion 96' of the stripper element 96. The rubber strip material is adapted to overlie the fabric on the guide roll 33 with the result that as the rubberous strip material, the fabric, and the pressure and forming bands engage the heating roll 18 the rubberous material will be adjacent the heating roll, the fabric will overlie the rubberous strip material on the heating roll and the forming and pressure bands will engage the dress face of the fabric F.

Rotation of the heating roll 18 is timed such that when the fabric reaches the stripper element 96 the rubber is permanently vulcanized to the fabric and is furthermore vulcanized into its deformed decorative formation. At this time the

stripper blade 98 insures separation of the leading edge of the fabric from the heating roll 18. The decorated fabric is guided about the roll 34 by means of tape 100 and is then advanced along the top of the forming bands 40 until it passes over roll 44 at which time the finished fabric may be removed. If desired, a conveyor means may be provided to receive the fabric from the roll 44, as will be obvious.

As the fabric is carried about the heating roll 18 the lateral edges which are not to be decorated are supported between the rotating guide rings 22 and guide tapes 105.

The foregoing detailed description has been given for clearness and understanding only, and no unnecessary limitation should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

What I claim as my invention is:

1. A machine for decorating fabric comprising a roll, means for heating said roll, a continuous forming band adapted to engage said roll throughout less than the complete circumference thereof, said band being of substantial thickness, and having transverse slots providing longitudinally spaced areas of reduced thickness formed in its outer surface.

2. A machine for decorating fabric comprising a roll, means for heating said roll, a continuous forming band adapted to engage said roll throughout less than the complete circumference thereof, said band having apertures formed therethrough, said band being of substantial thickness, and having transverse slots providing longitudinally spaced areas of reduced thickness formed in its outer surface.

3. A machine for decorating fabric comprising a roll, means for heating said roll, a continuous forming band adapted to engage said roll throughout less than the complete circumference thereof, said band having apertures formed therethrough, said band being of substantial thickness, and having transverse slots providing longitudinally spaced areas of reduced thickness formed in its outer surface, and a pressure band under relatively great tension engaging the outer surface of said forming band and pressing it against said roll.

4. In a machine of the class described, a forming band of substantial thickness having apertures therethrough, and having a series of closely spaced transverse slots providing longitudinally spaced areas of reduced thickness extending across said band.

5. In combination, a roll, a forming band adapted to engage said roll, and a pressure band movable with and adapted to engage said forming band and to press the same against said roll, said forming band being of substantial thickness, having apertures therethrough, and having transverse slots providing longitudinally spaced areas of reduced thickness thereacross, the slots providing increased flexibility.

6. A heated roll, an endless band engageable with said roll throughout a distance slightly less than its complete circumference, means for tensioning said band comprising a roller adjustable relative to said band, said roller being of small diameter, an annular member of substantially larger diameter mounted over said roller in eccentric relation and held against said roller by said band.

7. A heated roll, an endless band engageable with said roll throughout a distance slightly less than its complete circumference, means for tensioning said band comprising a roller adjustable relative to said band, said roller being of small diameter, an annular member of substantially larger diameter mounted over said roller in eccentric relation and held against said roller by said band, said annular member having guide flanges at its edges.

8. A machine for decorating fabrics comprising a heated roll, a forming band in pressure contact with said roll throughout a substantial peripheral extent and adapted to receive a fabric and a strip of deformable material between said band and the roll, and means engaging the fabric in advance of the point where said band presses said fabric and material against said roll for gathering fullness in said fabric to permit substantial displacement as said deformable material is deformed under pressure of said band.

9. A machine for decorating fabric comprising a heated roll, a plurality of endless forming elements adapted to extend around a substantial peripheral extent of said roll under pressure, and to receive a fabric to be decorated and a strip of deformable material between said roll and said elements with the deformable material next said roll, and to apply pressure thereto in a manner to displace said moldable material into thickened beads intermediate said forming elements, and members engaging said fabric just prior to engagement of said fabric between said roll and forming elements for gathering said fabric to provide fullness in said fabric between said elements.

10. A machine for decorating fabric comprising a heated roll, a plurality of endless forming elements adapted to extend around a substantial peripheral extent of said roll under pressure, and to receive a fabric to be decorated and a strip of deformable material between said roll and said elements with the deformable material next said roll, and to apply pressure thereto in a manner to displace said moldable material into thickened beads intermediate said forming elements, said fabric engaging said elements prior to engagement with said roll, and members intermediate said elements engaging said fabric and displacing said fabric relative to said elements to provide fullness in said fabric between said elements.

11. In a machine of the class described, a heated roll, a narrow, endless forming band in pressure contact with said heated roll throughout a substantial peripheral extent, guide rolls for supporting said band, and over which said band is flexed in operation, at least one of said rolls being of small diameter, and means for preventing abrupt flexing of said band comprising a ring of larger diameter held against said guide roll by said band.

12. In a machine of the class described, a heated roll, a plurality of closely spaced, narrow endless bands in pressure contact with said heated roll for a substantial peripheral extent, separate, adjustable guide rolls for each band, said guide rolls being of small diameter, and means for preventing abrupt flexing of said band comprising a ring of larger diameter held against each guide roll by the corresponding band.

CLARENCE J. DAVIES.