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T. E. DAVIS

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METHOD AND MEANS FOR COLORING EMBOSSED FABRIC

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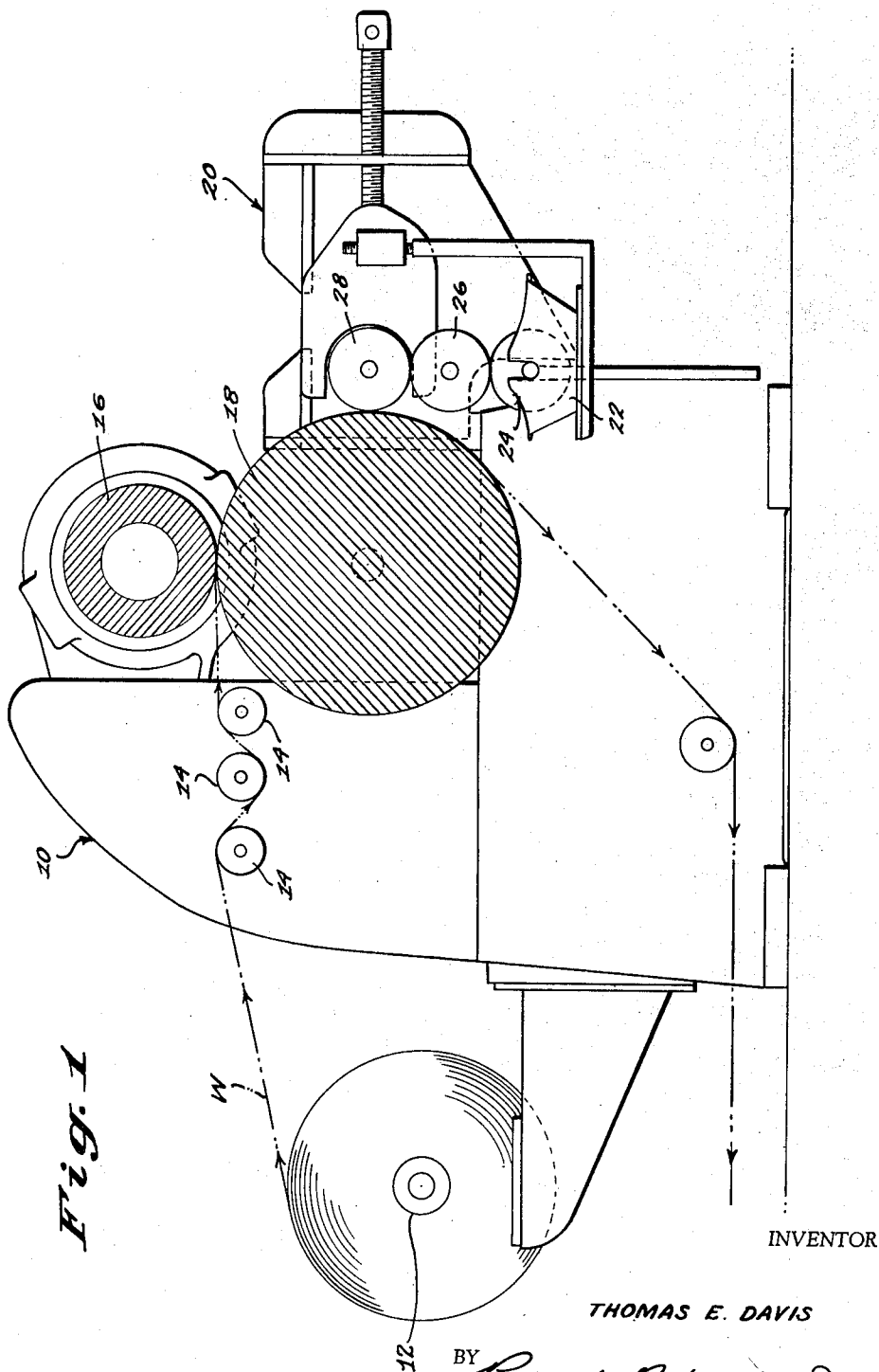


Fig. 1

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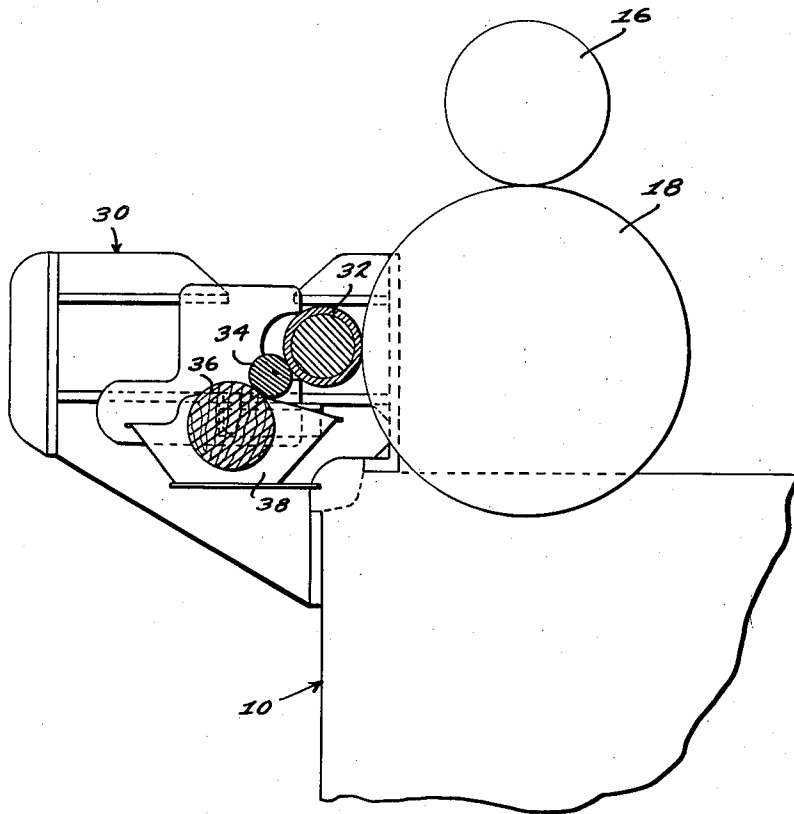
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Fig. 2



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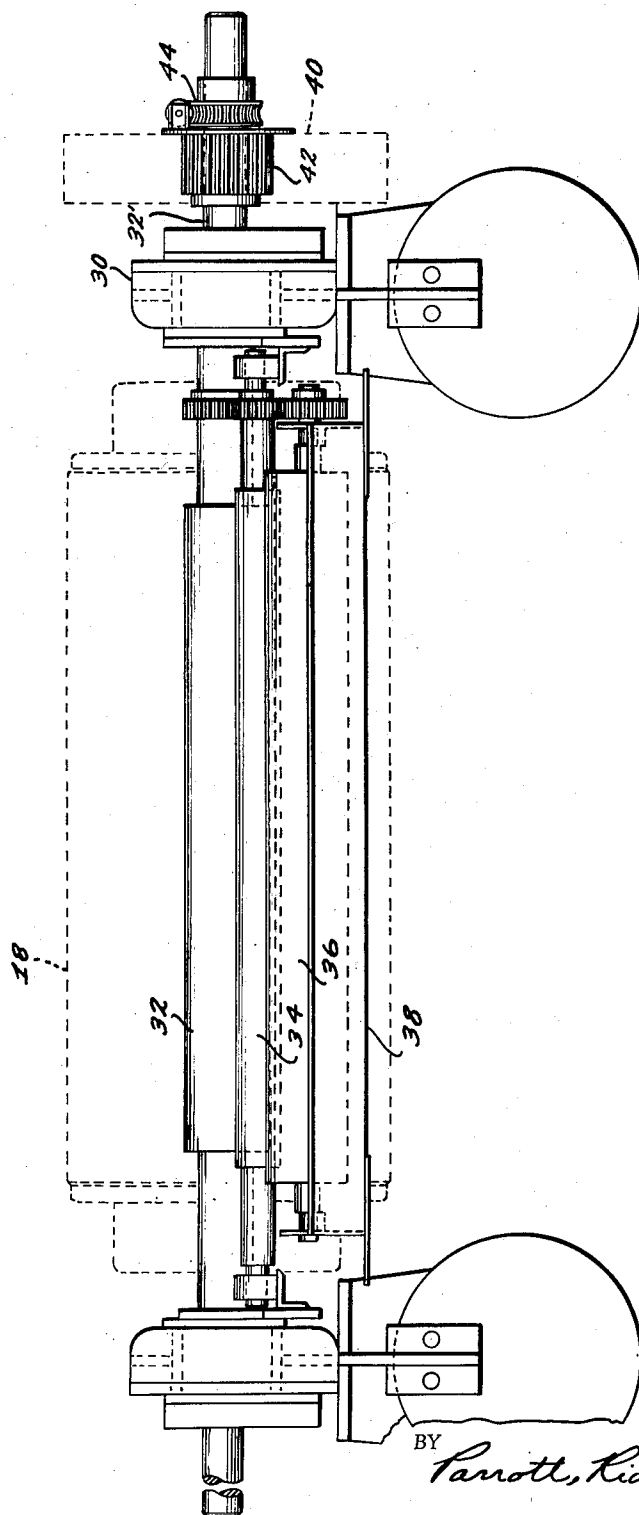
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Fig. 3



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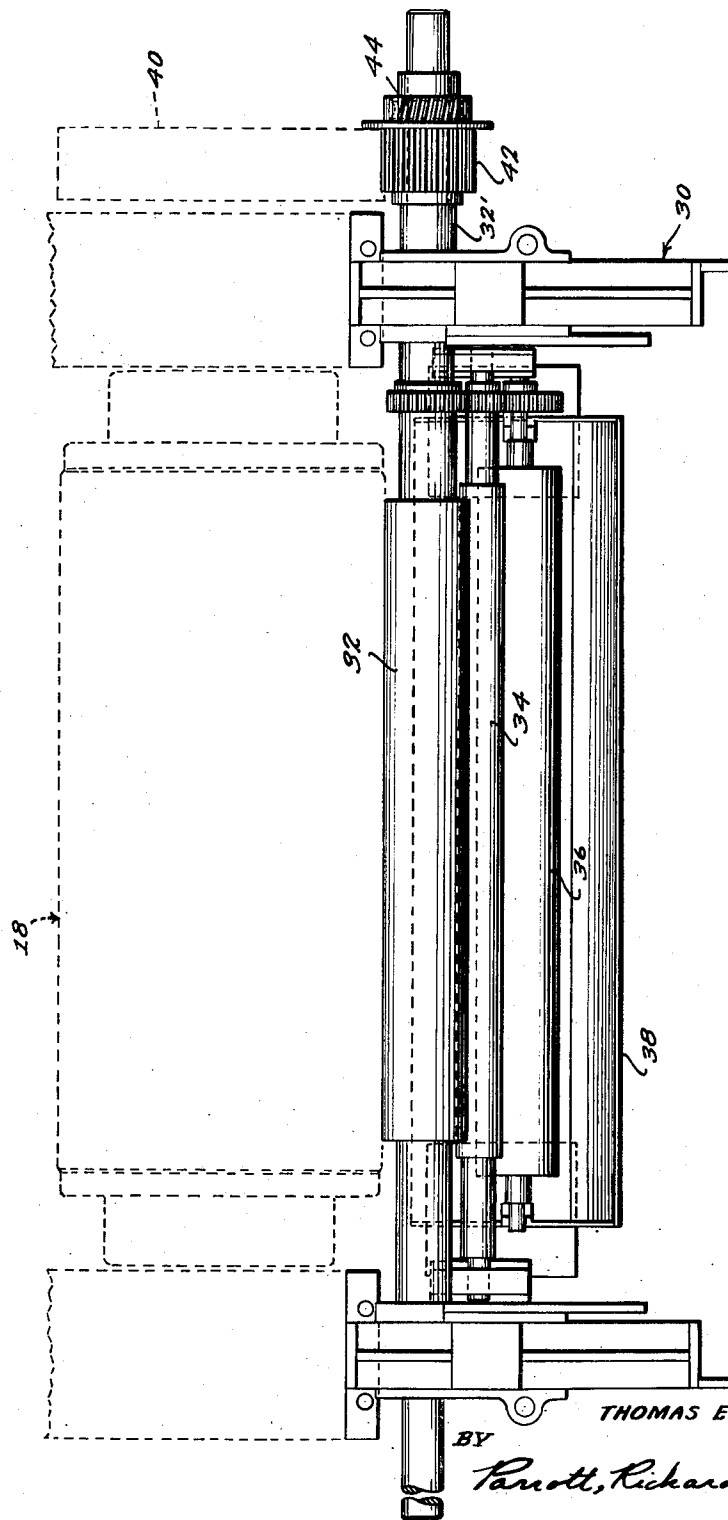
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METHOD AND MEANS FOR COLORING EMBOSSED FABRIC

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Fig. 4



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METHOD AND MEANS FOR COLORING
EMBOSSED FABRIC

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8 Claims. (Cl. 117—11)

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This invention relates to the coloring of embossed fabrics, and more particularly to an unique method and means by which embossed fabrics may be colored or printed directly at the embossing.

The coloring method and means of the present invention are characterized in particular by the application of color to portions of an embossed fabric web while the web is still carried on the backing surface for the embossing operation, and so that this backing surface is employed for the coloring operation as well as the embossing. The resulting colored embossed fabric produced in this manner may be of the "tipped" type in which contrasting color is applied to the raised portions on one face of the embossed fabric, or the color application may be made instead at the ground portions of the embossed fabric.

These and other features of the present invention are described more in detail below in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation, in more or less schematic form, showing an embossing press equipped for coloring in accordance with the present invention;

Fig. 2 is a further fragmentary side elevation showing a modified arrangement for the coloring means;

Fig. 3 is an end elevation as seen generally from the left in Fig. 2; and

Fig. 4 is a plan view corresponding generally to Fig. 2.

Referring now in detail to the drawings, Fig. 1 shows an embossing press or calender in which a supply roll letoff is arranged at 12 for delivery of a fabric web W to be embossed through tensioning bars as at 14 and between a steel engraved embossing roll 16 and a composition or filled backing roll 18, such as are conventionally provided in embossing presses, the embossing roll 16 being engraved in relief with embossing pattern desired and the composition roll 18 assuming a complementary form as it is run in to provide a backing surface for the embossing operation.

Fig. 1 also shows an arrangement in accordance with the present invention for a coloring unit 20 on the embossing press 10, this coloring unit 20 incorporating a suitable mounting arrangement for a color pan 22, a furnisher roll 24, a transfer roll 26, and a color applicator roll 28 arranged in opposed relation to the composition backing roll 18 beyond the engraved embossing roll 16. The color applicator roll 28

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and the transfer and furnisher rolls 26 and 24 are shown in Fig. 1 in a form suitable for "tipping" the embossed web W with color, these rolls 24, 26 and 28 all being provided as smooth rubber rolls in this case and arranged with uniform diameters.

In Fig. 2, a modified form of coloring means is shown at 30 arranged suitably for coloring ground portions of the embossed web W. For this coloring means 30 an engraved color applicator roll 32 is provided in which the embossing pattern being used is formed in correspondence with the embossing roll 16, and in which an engraved printing pattern is formed in the remainder of its surface, so that the applicator roll 32 can be run against the backing roll 18 and used to print a desired pattern on the ground portion of the embossed web W. Any suitable transfer roll 34 and furnisher roll 36 may be employed to supply color to the applicator roll 32 from a color pan 38.

In order to use either of the above noted coloring arrangements effectively according to the present invention, it is necessary to provide for driving the applicator roll 32 (or 28) with a surface speed equal to that of the backing roll 18, and this is done by employing a geared connection from the backing roll drive gear 40 through a mating pinion 42 arranged on the applicator roll shaft 32', and fitted with a worm and worm wheel pitch adjustment as at 44 by which the engraved pattern of the applicator roll 32 may be made to register or fit with the pattern of the embossing roll 16 and the backing roll 18. This pitch adjustment 44 is not necessary when smooth applicator rolls such as 28 are used for "tipping," but the geared connection at the pinion 42 must still be maintained accurately in order to obtain effective running contact with the backing roll 18.

The present invention has been described above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. The process which comprises first embossing a fabric web between a relieved embossing surface and a complementary backing surface that are cylindrical in form and are caused to rotate at equal surface speeds, and then subsequently and separately contacting portions of said embossed web with a cylindrical color applying surface while the web is still carried on said backing surface, while causing said color applying surface to rotate at an equal surface speed with

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said backing surface, and while supplying color to said color applying surface.

2. The process as defined in claim 1 and further characterized in that said color applying surface is provided as a smooth surface for tipping the raised portions of said embossed web with color.

3. The process as defined in claim 1 and further characterized in that said color applying surface is provided as a relieved surface in correspondence with the pattern of said embossing surface for applying color to the ground portions of said embossed web.

4. Apparatus of the character described for coloring an embossed fabric, said apparatus comprising, in combination with an embossing press incorporating an embossing roll engraved in relief and an opposed filled roll forming a backing surface bearing a complementary raised pattern, a smooth surfaced color applicator roll arranged to run in opposed relation to said filled roll beyond said embossing roll with the smooth surface of said color applicator roll disposed to run against only the raised pattern portion of said filled roll, color supply means and a smooth surfaced transfer roll for delivering color from said supply means uniformly over said raised pattern portion of the applicator roll, and a geared connection for driving said applicator roll from said filled roll at an equal surface speed.

5. Apparatus of the character described for coloring an embossed fabric, said apparatus comprising, in combination with an embossing press incorporating an embossing roll engraved in relief and an opposed filled roll forming a backing surface bearing a complementary pattern raised above a ground, a color applicator roll relieved at the peripheral surface thereof in correspondence with the pattern of said embossing roll, said color applicator roll being arranged in opposed relation to said filled roll beyond said embossing roll and disposed to run against only the ground of said filled roll, color supply means and a smooth surfaced transfer roll for delivering color from said supply means uniformly over the unrelieved peripheral surface of said applicator roll, and an adjustable geared connection for driving said applicator roll from said filled roll at an equal surface speed and in register therewith.

6. The process which comprises first delivering a fabric web between a relieved embossing surface of cylindrical form and a complementary cylindrical backing surface while causing said embossing and backing surfaces to rotate in opposed relation and thereby emboss said fabric web, then training the embossed web about said backing surface beyond said embossing surface and thereby maintain said embossed web supported on said backing surface separately from

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said embossing surface, and then causing a cylindrical color applying surface to rotate separately from said embossing surface in opposed relation to said backing surface and in contact with portions of the embossed web supported thereon while supplying color to said color applying surface.

7. Apparatus of the character described for coloring an embossed fabric, said apparatus comprising, in combination with an embossing press incorporating an embossing roll engraved in relief and an opposed filled roll forming a backing surface bearing a complementary raised pattern disposed for rotating in opposed relation, a color applicator roll arranged to run in opposed relation to said filled roll and in spaced relation beyond said embossing roll with respect to the direction of rotation of said filled roll, said color applicator roll having a peripheral surface formed and disposed to run against only a single peripheral level of the backing surface formed by said filled roll, color supply means and a smooth surfaced transfer roll for delivering color from said supply means uniformly over said peripheral surface of the color applicator roll, and means forming a drive connection to said color applicator roll from said filled roll for rotating said color applicator roll in opposed relation to said filled roll.

8. The method of producing an embossed and colored fabric comprising first passing a fabric between a rotating embossing surface and a complementary rotating backing surface to provide an embossed pattern on said fabric, continuously supporting the embossed fabric on the rotating backing surface, and while thus supported, continuously applying color along a line in a plane tangent to the raised portions of said embossed pattern.

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