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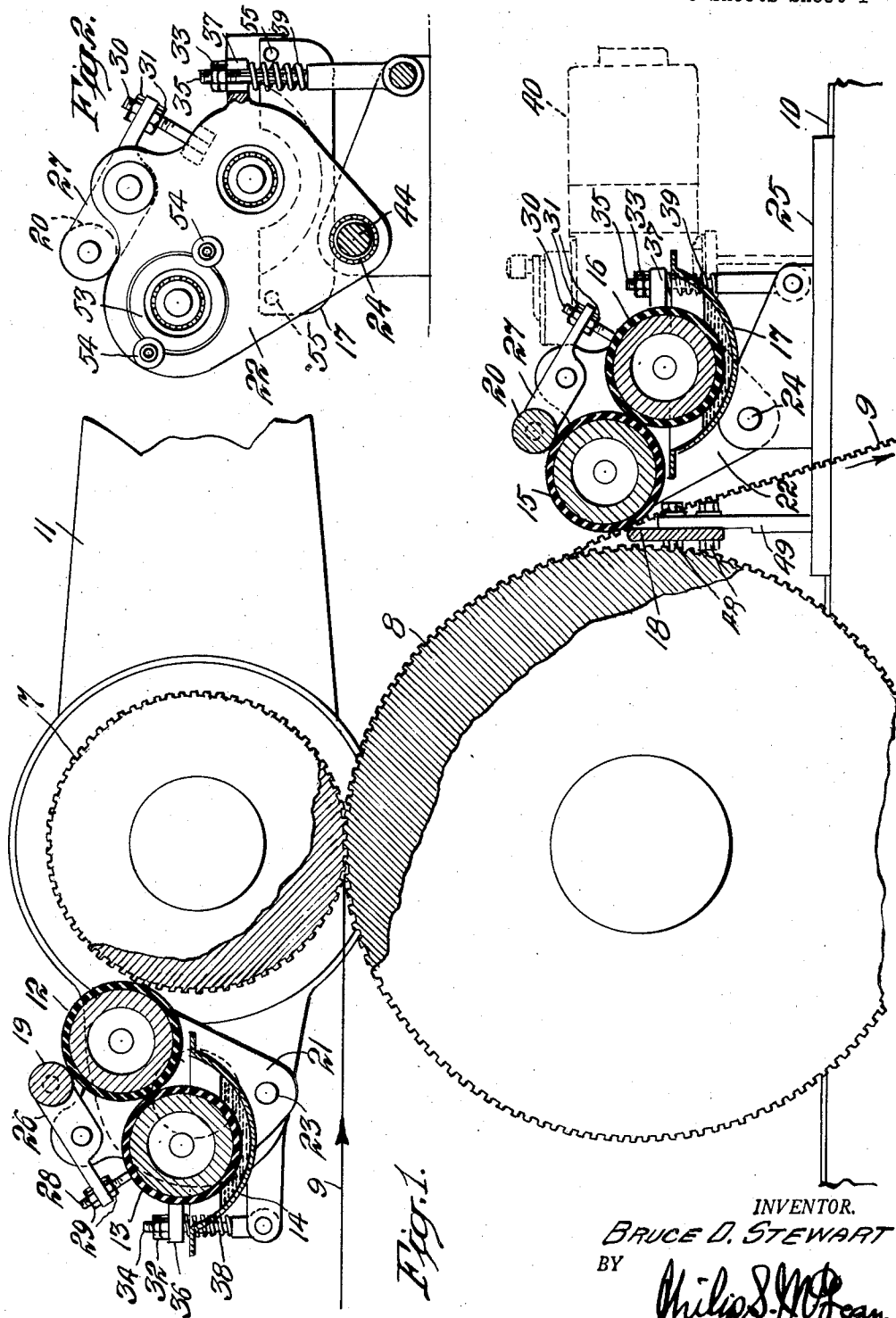
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INLAY AND TIPPING MACHINE

Filed March 25, 1955

3 Sheets-Sheet 1



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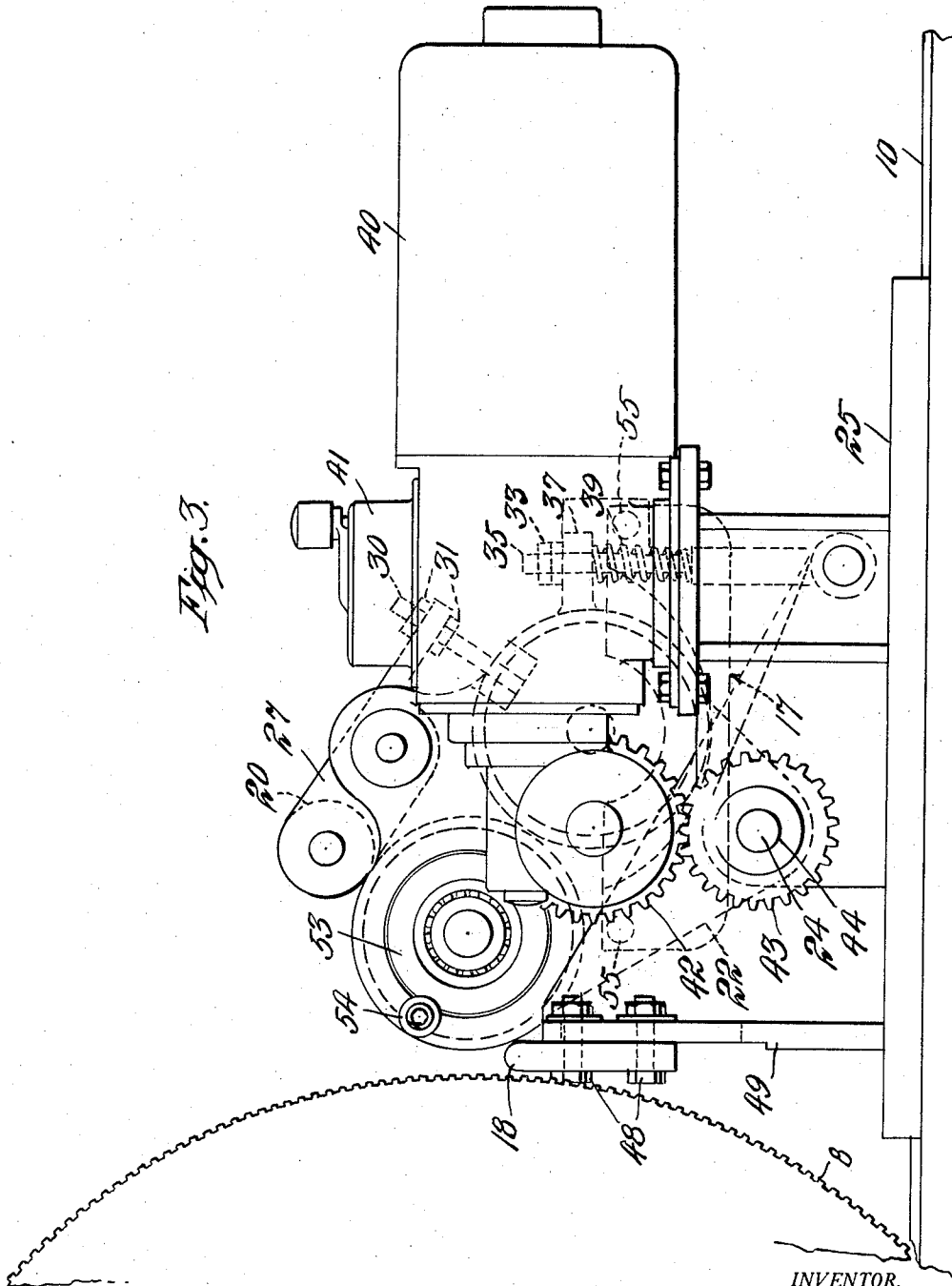
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3 Sheets-Sheet 2



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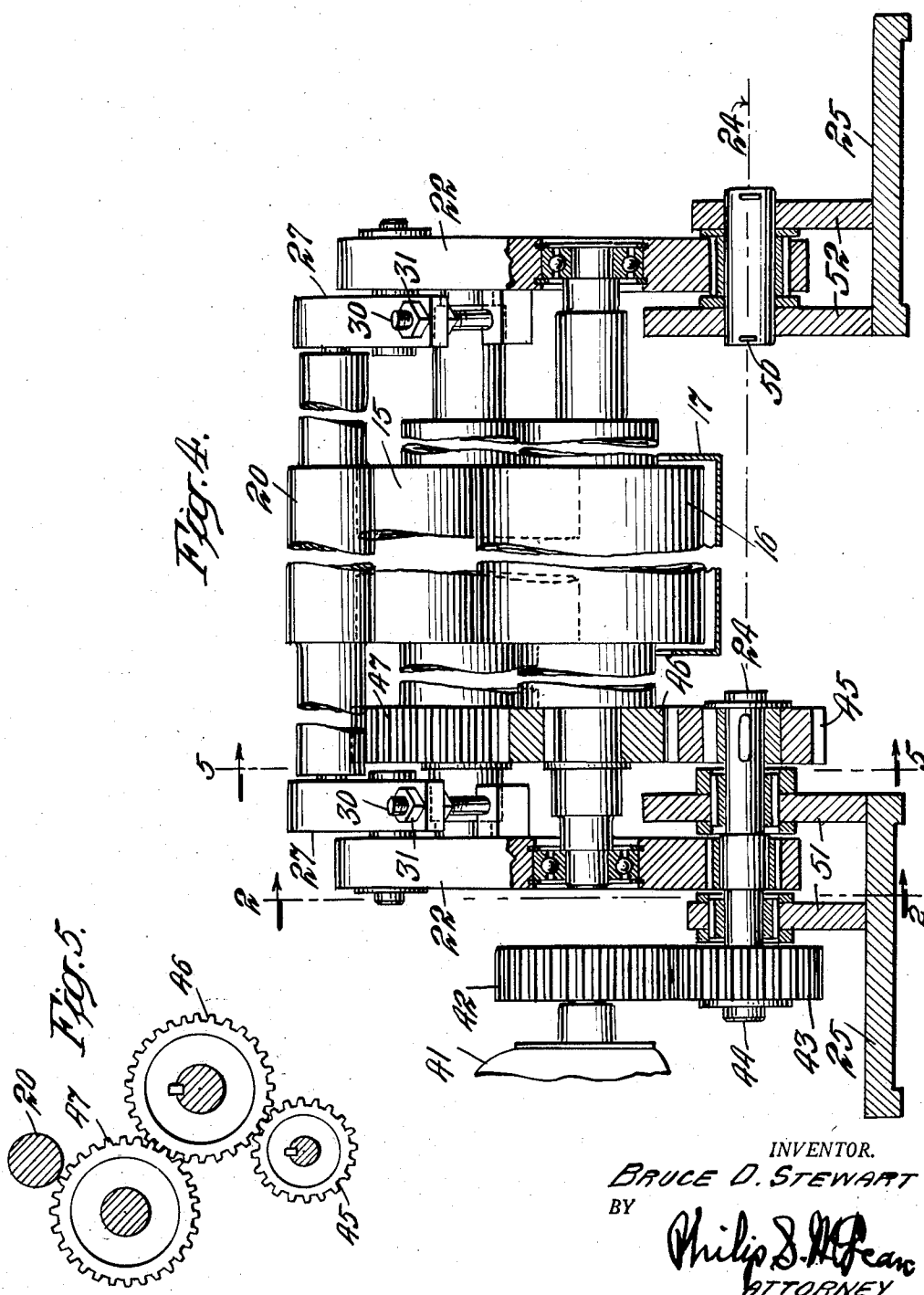
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INLAY AND TIPPING MACHINE

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Application March 25, 1955, Serial No. 496,754

5 Claims. (Cl. 101—23)

The invention herein disclosed relates to the inlaying and tipping of embossed web materials, the inlaying involving application of color to the low or background portions of the materials and the tipping involving application of color to the tips or peaks of the embossed materials.

Objects of the invention are to effect these operations as part of or in conjunction with the embossing operation and to accomplish this with accuracy and with fine control of color application.

Special objects of the invention are to enable either or both the inlaying and tipping operations to be effected on one and the same machine.

Further special objects of the invention are to combine either or both the tipping and inlaying with the embossing and to accomplish this without any one of these actions interfering with or impairing the action of any other.

In accomplishing these results the invention is combined with both the top or engraved roll and the bottom or filled roll of an embossing press or calender.

The filled roll being embossed from the engraved roll, may have certain slight irregularities or actually be somewhat eccentric and a special feature of the present invention is that any such irregularities or eccentricity of the filled, bottom roll are not allowed to have any effect on the tipping operation.

Also it is a feature of the present invention that the inlaying is or may be effected by the use of simple, smooth rolls, rather than by specially engraved rolls, cooperating with the top, engraved roll.

The avoidance of difficulty from irregularities or eccentricity of the filled roll is effected by stripping the embossed material at a point close to the filled roll before such material has opportunity to wrinkle or stretch, by means of a bar in the nature of a "straight edge" or equivalent and using that bar to accurately support the material engaged by the applicator roll of the tipping mechanism.

Other desirable objects and novel features of the invention are set forth and will appear in the course of the following specification.

The drawings accompanying and forming part of the specification are illustrative of a present commercial embodiment of the invention, but it will be appreciated that structure may be modified and changed, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a broken vertical section and partly diagrammatic illustration of the invention;

Fig. 2 is a broken vertical sectional view showing one end of the tipping mechanism with parts appearing as on substantially the plane of line 2—2 of Fig. 4;

Fig. 3 is an enlarged end elevation of the tipping mechanism with the bottom roll and part of the frame of the embossing calender shown broken away;

Fig. 4 is a broken part vertical sectional view of the tipping mechanism;

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Fig. 5 is a part sectional detail of the drive gearing appearing in Fig. 4, this view being taken on substantially the plane of line 5—5 of Fig. 4.

In Fig. 1 the top, engraved or embossing roll of an embossing calender is indicated at 7 and the companion embossed or filled roll at 8, with web material 9 passing between these rolls.

In this particular instance the calender is of the type disclosed in copending application Serial No. 471,744, filed November 29, 1954, with the bottom roll journaled in bearings on the ways 10 of the machine and the top roll journaled in levers 11 which can be raised to lift the top roll off the bottom roll or lowered to apply desired pressure to the web material.

Both inlay and tipping mechanisms are shown in Fig. 1, the inlay mechanism comprising applicator and furnisher rolls 12, 13 and color pan 14 mounted on levers 11 in cooperative relation with the top roll, and the tipping mechanism including applicator and furnisher rolls 15, 16 with color pan 17 mounted on the ways 10 in cooperative relation with a stationary backup bar 18 substantially at the line of separation of the embossed web from the filled roll.

The inlay and tipping mechanisms are generally similar in that they consist in each case of a furnisher roll 13, 16, rotating in a color pan 14, 17, a contact or applicator roll 12, 15 in engagement with the furnisher roll and a smoother roll 19, 20 for regulating and uniforming the ink or color film on the applicator roll, all mounted between end frames 21 at the inlay and 22 at the tipping mechanism.

These frames, as shown in Fig. 2, are in the nature of triangular plates, those of the inlay pivoted at their lower corners at 23, Fig. 1, on the arms or levers 11 carrying the top roll, and those of the tipping mechanism pivoted at their lower corners at 24 on base members 25 mounted on the ways 10.

Further features of similarity are present in that the smoother rolls 19, 20 are carried by levers 26, 27, respectively, which can be adjusted and secured by bolts and nuts 28, 29 and 30, 31 engaged with such levers, and in that the frames carrying the rolls can be adjusted on their pivotal supports 23, 24 by nuts 32, 33 on swing bolts 34, 35 engaged in forks 36, 37 of the frames, with springs 38, 39 on the bolts acting against the forks in opposition to the adjusting nuts 32, 33.

The inlay unit is thus adjustable at 32 in respect to the embossing roll 7 and the tipping unit is adjustable at 33 in respect to the stationary stripper or backing bar 18.

The applicator roll of the inlay unit is thus operative to apply color to the high or relief portions of the engraved roll, thus to enable the latter to transfer color to the embossed or ground portions of the web, and the applicator roll of the tipping unit is effective to apply color only to the high or peak portions of the embossed web.

The applicator rolls 12, 15 of both the inlay and tipping units may be smooth and be of rubber or metal, plastic or other materials as found best suited to particular circumstances.

The rolls of the inlay unit may be contact driven by engagement of the applicator roll with the engraved roll.

The rolls of the tipping unit, however, preferably are positively driven, as by a motor shown at 40 driving through a variable speed gear set 41, a gear 42, Fig. 4, in mesh with a lower gear 43, Figs. 3 and 4, on a shaft 44 on the pivot center 24 and carrying a gear 45 in mesh with gear 46 fixed to the furnisher roll 16, the latter gear meshing gear 47 on the applicator roll 15.

This motor drive, independent of the calender drive, enables the tipping applicator to be adjusted and kept at a proper speed to apply color to the tips of the em-

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bossed fabric, and this independently of any variations or irregularities in the surface of the embossed roll.

The backing or web supporting bar 18 is shown quite thin so that it may be set close to the surface of the filled roll and close to the point where the embossed web leaves the roll and before the web has a chance to wrinkle, stretch or become distorted in any way.

Figs. 1 and 3 show the bar 18 secured in vertically adjustable relation at 48 on posts or standards 49 on the tipping base 25.

This base, as shown in Fig. 4, may be in two channeled parts which seat down over the ways 10 of the calender and which can be secured on such ways between the filled roll and the wind-up at that side of the machine.

Fig. 4 shows the pivot center 24 for the frame of the tipping unit provided by the gear drive shaft 44 and idle shaft or pin 50 supported between pairs of upright flanges 51 and 52 on the companion base members 25.

Accurate adjustment of the applicator roll in respect to the furnisher roll is afforded in the illustration by means of eccentric bearings 53 for the applicator roll which can be turned one way or the other and then be secured by screw clamps 54, Figs. 2 and 3.

The applicator of the inlayer and the applicator of the tipping unit may be independently adjusted in respect to the engraved and the filled rolls of the embossing couple and be independently driven as shown in respect to surface speed of those rolls.

Accurate and fine control of the color films is provided and fouling of the embossed roll is avoided. Color for the inlay is applied only to the active portion of the engraved roll and the color for tipping is applied to the embossed web only after leaving the filled roll.

The color pans, indicated in a general way at 14 and 17, are preferably supported so that they may be removed and be replaced without affecting adjustments which may have been previously made, as by supporting them as shown in Figs. 2, 3 and 4, on inwardly projecting pins 55 carried by the end frames 21, 22 of the units, these pins being long enough preferably to enable the pans being slid lengthwise one way or the other to enable quick and easy disengagement from or supported engagement in the unit.

The inlay and tipping units may be mounted on the special embossing calender illustrated or on any other generally similar embossing press or calender and be used either one separately or both together, as required.

When not in service the units may be left in place, backed off to separate the applicator rolls from the engraved or filled rolls of the press.

The backing or web supporting bar 18 of the tipping attachment, when not in service for tipping, may be left in place, with the applicator roll out of pressure relation, as a stripper for separating and guiding the embossed web from the filled roll.

While the round edge, thin bar for supporting the embossed web at the tipping station may be preferred because of the fact primarily that it can be set close to the filled roll, other forms of equally accurate web supports may be substituted, such as larger radius circular bars, cylindrical rolls or the like.

In place of the smoother rolls shown, doctor blades may be substituted and other such changes made, these all coming within the true intent and scope of the invention.

Details of the special embossing calender are not herein illustrated since those are fully disclosed in the patent application above identified.

The applicability of the present invention as an attachment or attachments, depending upon whether one or the other or both the inlay and tipping units are used, illustrates the point that the invention is of more or less universal application to embossing calenders in general.

The yielding adjustment of the color applicators toward the engraved roll and web supporting bar and the

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positive adjustment of these applicators in the opposite direction, away from the roll and the bar, make these units self-protective and safe in that they will yield away from the companion parts to pass possible obstructions such as seams, slubs or the like.

Savings in time and expense are effected by having the inlay and tipping units in separate attachments which can be readily combined with embossing calenders of usual or special design and operated, either or both, at the same time that the web is being embossed. The inlay unit is located at one side of the machine in co-operative relation with the top roll and the tipping unit is located at the opposite side of the machine in co-operative relation to the web stripping and supporting bar of the filled roll, so that these units do not in any way interfere with each other or with the embossing action. The upper edge of the supporting bar may be rounded on a short radius, as shown, and it is finished smooth with the precision of a "straight edge" so as to accurately present the tips of the embossed material to the applicator roll.

While the invention makes it possible to use an ordinary smooth roll instead of an expensive, reversely engraved roll matching the top roll of the press, engraved or other special rolls may be used for applying color to the engraved top roll.

What is claimed is:

1. Color applicator for embossing calenders comprising end frames, pivotal supports for the lower portions of said end frames, pins projecting inwardly from said end frames in opposed relation, a color pan of less length than the distance between the opposed ends of said pins slidably engaged on said pins in readily removable and replaceable relation, a furnisher roll journaled in said end frames over said pan, an applicator roll journaled in said end frames in engagement with said furnisher roll, a bolt and nut adjustable for rocking the end frames on said pivotal support in one direction and a spring for yieldingly rocking said end frames on said pivotal support in the opposite direction.

2. The invention according to claim 1, with a smoother roll and means for adjustably supporting the same in color film controlling relation with said applicator roll.

3. The invention according to claim 1, with eccentrically adjustable bearings for said applicator roll for effecting adjustment of said roll in respect to the furnisher roll.

4. Color applicator for embossing calenders comprising a color pan, companion furnisher and applicator rolls cooperative with said color pan, end plates in which said rolls are journaled and in which said color pan is supported, aligned shafts pivotally supporting said end plates, one of said shafts being rotatable and having gears at opposite ends of the same, a motor driven gear in engagement with the gear on the outer end of said shaft, a gear on the inner end of said shaft, a gear on the furnisher roll engaged by the gear on the inner end of said shaft and a gear on the applicator roll engaged by said furnisher roll gear.

5. Embossing and tipping calender, comprising the combination of companion engraved and filled rolls for embossing a web passed between the same and means for tipping the embossed web after passage between the rolls, close to but separated from the filled roll and comprising a stationary rigid web stripping and backing bar supported close to the surface of the filled roll at a point where the web after being embossed is ready for separation from the filled roll, said bar having a narrow upper edge enabling it to be accommodated in the diminishing convergent angle between the surface of the filled roll and the relatively inclined embossed web leaving the roll at a tangent, said narrow upper edge of the bar having a smoothly rounded accurate straight edge finish engaging the underside of and slidably supporting the

embossed web as it leaves the filled roll, a color applicator roll opposed to said rounded straight edge portion of the stationary bar and supported for rolling engagement with the embossed tips of the web sliding over said bar and a motor connected to drive said applicator roll independently of the drive of the filled roll and whereby the tipping color may be applied at the same or different surface speed of the web leaving the filled roll.

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