

July 22, 1969

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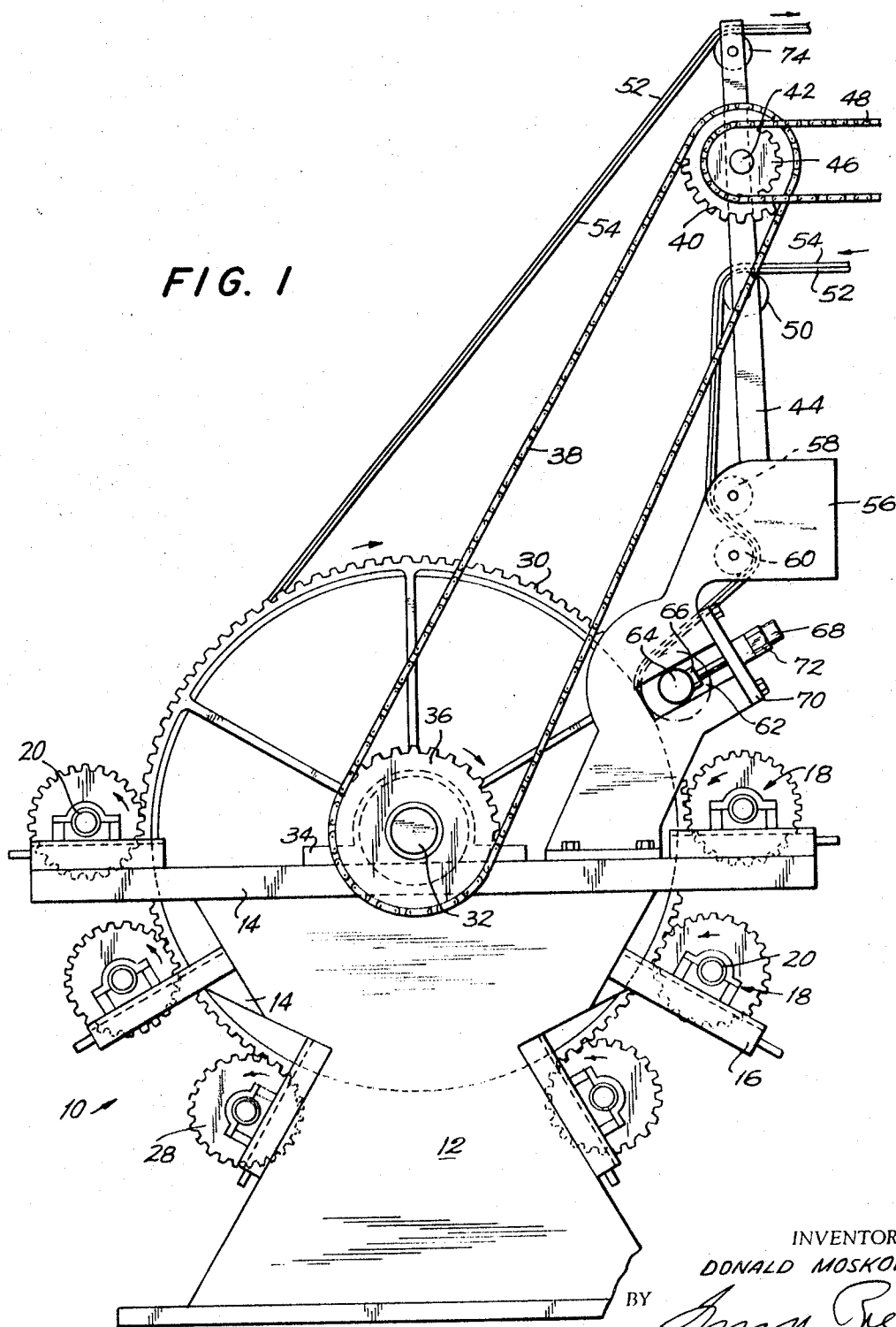
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CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

Filed Jan. 9, 1967

6 Sheets-Sheet 1

FIG. 1



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CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

Filed Jan. 9, 1967

6 Sheets-Sheet 2

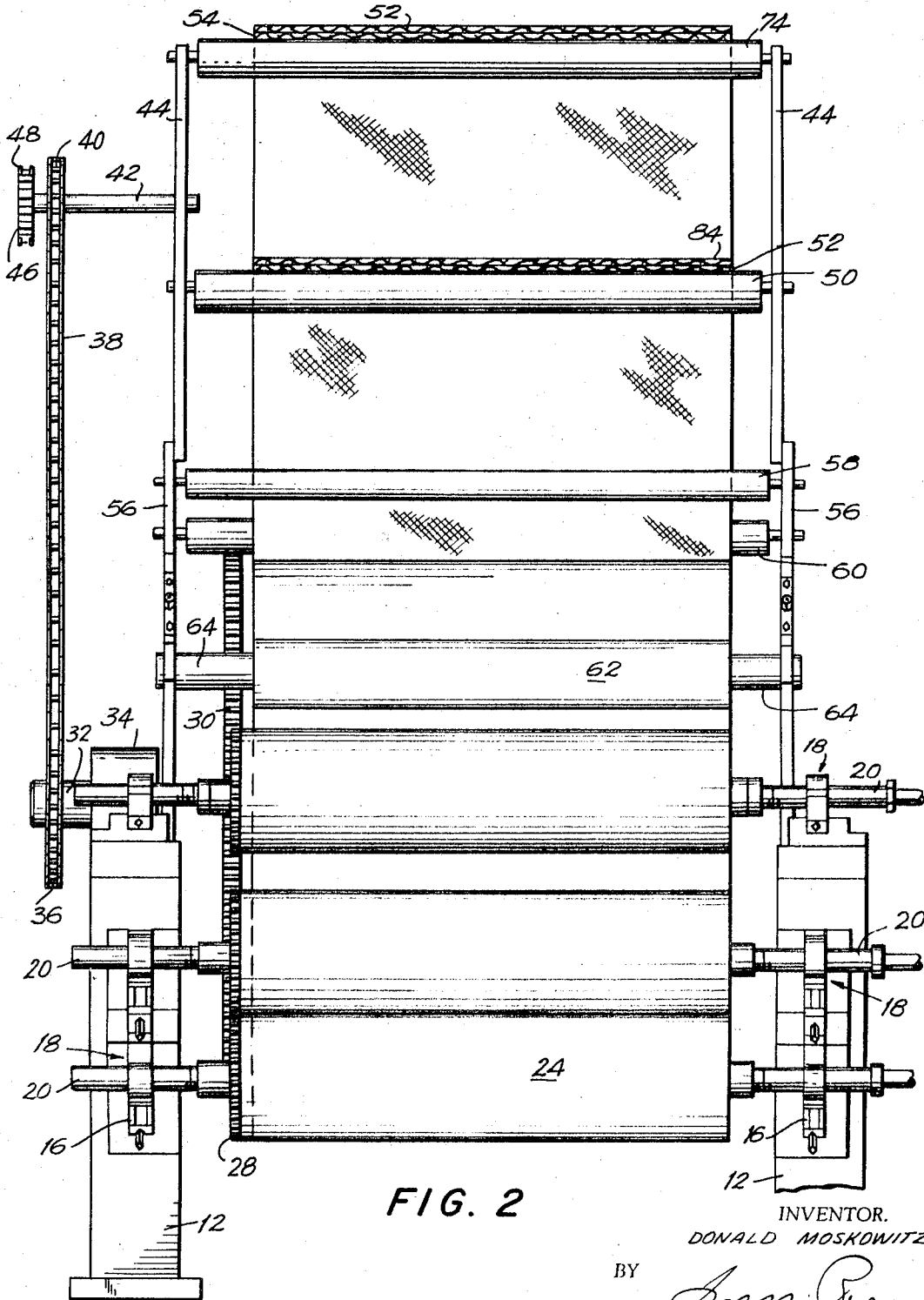


FIG. 2

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CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

Filed Jan. 9, 1967

6 Sheets-Sheet 4

FIG. 6

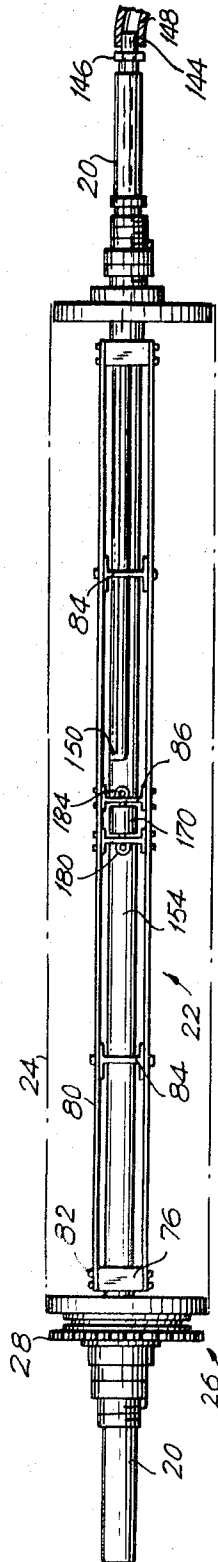
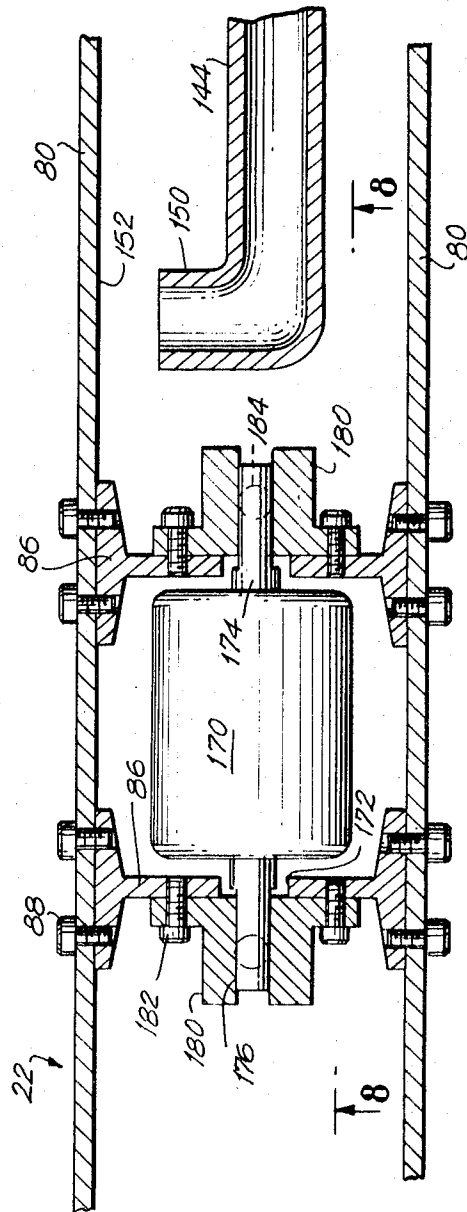


FIG. 7



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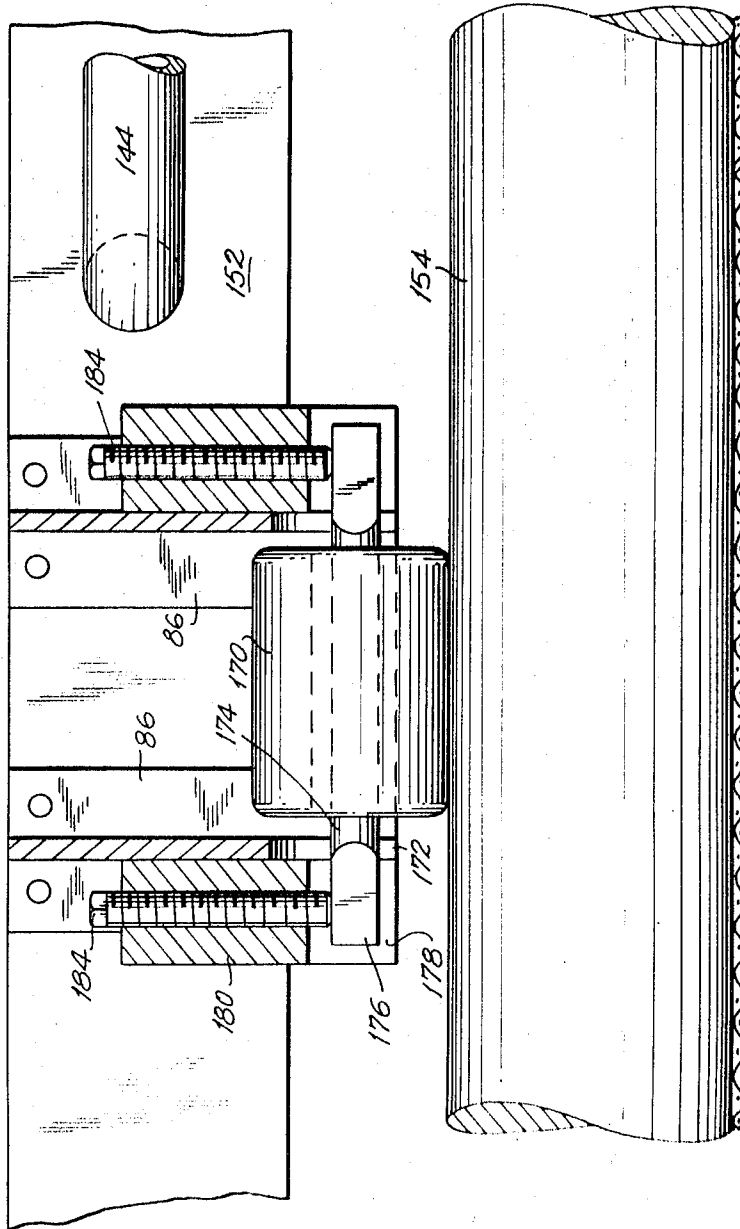
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CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

Filed Jan. 9, 1967

6 Sheets-Sheet 5

FIG. 8



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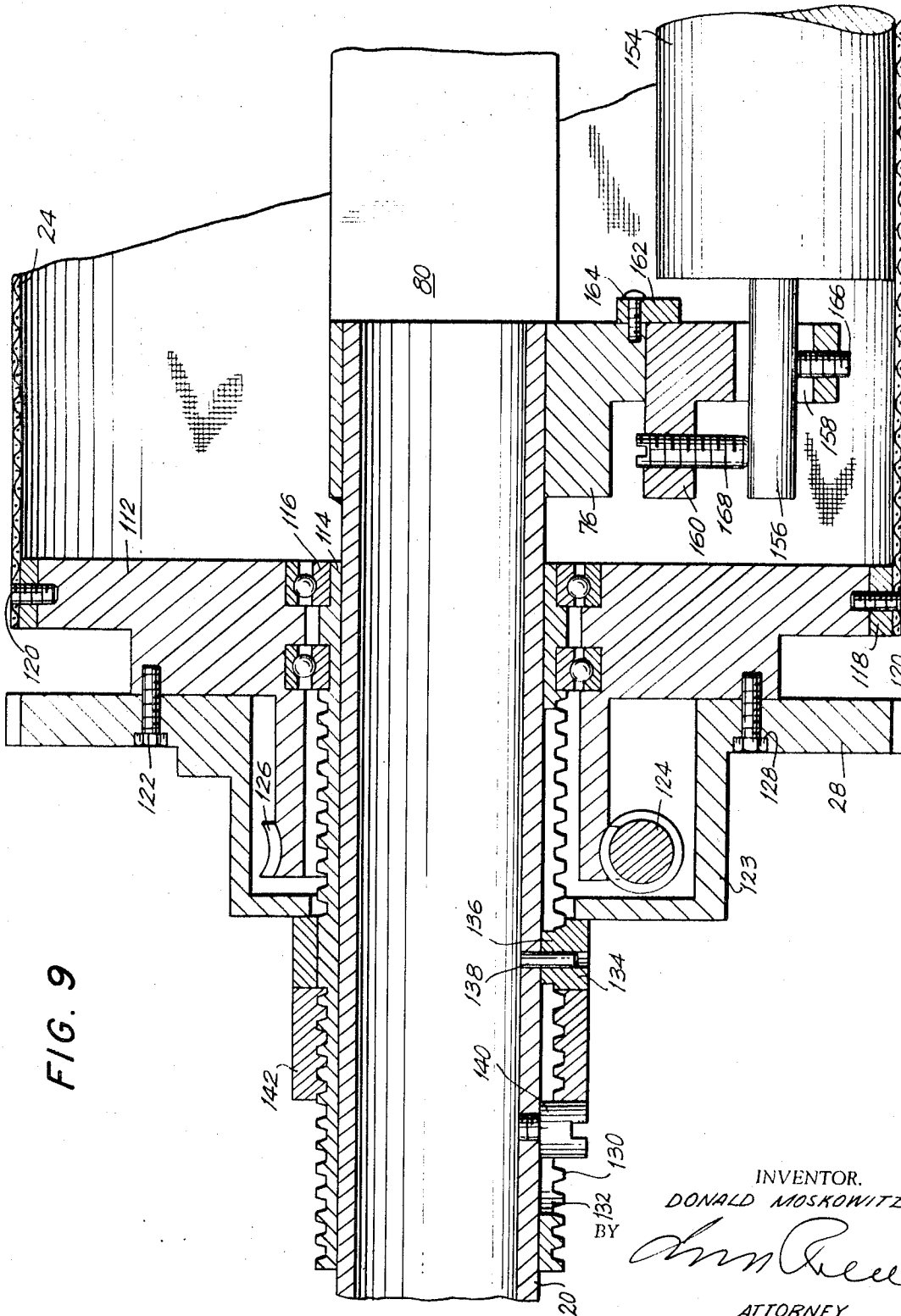
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CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

Filed Jan. 9, 1967

6 Sheets-Sheet 6



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3,456,584

CYLINDER ADJUSTING MEANS IN ROTARY SCREEN PRINTING MACHINE

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Filed Jan. 9, 1967, Ser. No. 608,203

Int. Cl. B411 13/04; B41f 13/24

U.S. Cl. 101-119

9 Claims

ABSTRACT OF THE DISCLOSURE

The present disclosure describes a rotary screen printing machine having a central rotary drum and a plurality of rotary screen assemblies distributed circumferentially around said drum, with adjusting means for adjusting each screen assembly both tangentially and radial with respect to the drum.

The present invention relates to screen printing.

In particular, the present invention relates to a rotary screen printing machine. As is well known, rotary screen printing is highly desirable because of the fact that it is capable of continuously printing on a given sheet material.

Conventional screen printing machines of this type include a central drum about which the cylindrical printing screens are distributed with these screens extending parallel to the axis of the drum. Through a suitable drive means the screens are rotated while the sheet material is fed around the drum between the latter and the screens.

With machines of this type it is of course extremely important to have the several cylindrical screens properly adjusted with respect to the central drum, so that the printing will be accurately aligned not only on the sheet material, but also the printed portion derived from one screen will be properly positioned with respect to the printed portion derived from another screen.

Another problem which is encountered in machines of this type is the application of the coloring material to the sheet material with a proper pressure. This is particularly important when dealing with relatively soft sheet material such as relatively thick fabrics where crushing of the fabric is highly undesirable but at the same time a positive application of the coloring material with suitable pressure against the surface of the fabric is required.

It is accordingly one of the primary objects of the invention to provide a rotary screen printing machine with a structure which will enable each cylindrical screen to be very accurately positioned, in a rapid accurate manner.

In particular, it is an object of the invention to provide a structure which is capable of adjusting such a screen both tangentially and radially with respect to the drum, as well as circumferentially about its own axis and longitudinally along its own axis, so that all conceivable adjustments of the screen can be carried out to properly position the screen for achieving the best possible printing on the sheet material.

Furthermore, it is an object of the invention to provide within each cylindrical screen a structure which will control the pressure with which the coloring material is applied to the sheet material, which is to say the manner in which the coloring material is distributed through the permeable screen portions.

Furthermore, it is an object of the invention to provide a construction for each rotary screen assembly which will reliably prevent undesirable splashing of the coloring material and will guarantee a uniform proper distribution of the coloring material not only along the entire length of the screen but also in its passage through the permeable screen portions.

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Also, the objects of the present invention include the provision of an extremely simple, rugged apparatus which will achieve the above objects in an extremely convenient manner requiring a minimum amount of maintenance as well as providing quick and accurate setting up and disassembly of the apparatus, so that changeover from one printing operation to another printing operation can be very quickly carried out.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

The machine of the invention has a drum about which a plurality of the rotary screen assemblies of the invention are distributed. The several rotary screen assemblies of the invention extend parallel to the axis of the drum while being circumferentially distributed thereabout. Each rotary screen assembly of the invention includes an elongated hollow rotary screen and an elongated inner support means extending along the interior of the hollow screen and having free ends which respectively project beyond the ends of the hollow screen. A drive means is supported for rotary movement by the support means of each assembly and carries the hollow screen so as to rotate the latter with respect to the support means.

In accordance with one of the features of the invention a pair of end adjusting means are respectively connected operatively with the free ends of the inner support means, where these ends project beyond the screen, to adjust each end of each support means both tangentially and radially with respect to the drum axis. In addition the support means carries an adjusting means for adjusting the drive means and through the latter the screen along the axis of the screen, and furthermore there is connected between the drive means and the screen a structure for circumferentially adjusting each screen with respect to the drive means. It is therefore possible with the structure of the invention to adjust each screen both tangentially and radially at each of its ends as well as to adjust each screen both axially and circumferentially, so that a very accurate adjustment can be achieved.

In addition, there is situated in the interior of each screen an elongated distributing roller and a supply means for supplying coloring material to the interior of the screen to be distributed therethrough by the distributing roller. A pressure adjusting means is carried by the support means in each screen for adjusting the pressure with which the distributing roller engages the inner surface of the screen, and in addition the supply means for supplying the coloring material has a special construction which will prevent undesirable splashing or concentrations of the coloring material.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is a partly schematic side view of one possible embodiment of an apparatus according to the invention;

FIG. 2 is an end view of the machine of FIG. 1 as seen from the right of FIG. 1;

FIG. 3 is a top plan view of an end adjusting structure of the invention shown supporting one of the ends of an

inner support means of a rotary screen assembly of the invention;

FIG. 4 is a sectional elevation of the structure of FIG. 3 taken along line 4—4 of FIG. 3 in the direction of the arrows;

FIG. 5 is a longitudinal section of the structure of FIGS. 3 and 4 taken along line 5—5 of FIG. 4 in the direction of the arrows;

FIG. 6 is an elevation view of one of the rotary screen assemblies of the invention shown without the screen so as to clearly illustrate the structure therein;

FIG. 7 is a sectional illustration of part of the inner support means of each rotary screen assembly, FIG. 7 showing in particular part of the supply means as well as part of the structure for adjusting the pressure of a distributing roller;

FIG. 8 is a partly sectional elevation of the structure of FIG. 7 taken along line 8—8 of FIG. 7 in the direction of the arrows, FIG. 8 showing in addition a portion of the distributing roller and the screen; and

FIG. 9 is a longitudinal sectional elevation of an end portion of a screen together with the structure at this end portion.

Referring now to FIGS. 1 and 2, the rotary screen printing machine 10 illustrated therein includes a pair of robust side standards 12 fixedly mounted in any suitable way on a floor or other suitable supporting surface. These robust standards 12 carry, either directly or through suitable rugged supports 14, pairs of elongated guide blocks 16 which are arranged to extend substantially radially from a common axis, as is apparent from FIG. 1.

These guide blocks 16 serve to carry and guide end adjusting means 18 which support and serve to adjust the ends 20 of a plurality of elongated inner support means 22 (FIG. 6) which respectively extend along the interiors of hollow screens 24 of the several rotary screen assemblies which are distributed about and extend parallel to the axis of the central drum, as is most clearly shown in FIG. 1.

As may be seen from FIG. 6, the rotary screen 24, shown in dot-dash lines in FIG. 6, of each rotary screen assembly is driven by a drive means 26 which is supported for rotary movement by the elongated inner support means 22 and which includes a drive gear 28. The several drive gears 28 are shown in FIG. 1. They all mesh with a common gear 30 situated at one side of the drum coaxially therewith.

The gear 30 is fixedly mounted on a shaft 32 which is journaled in a bearing assembly 34 carried by the left standard 12 of FIG. 2. At its outer end the robust shaft 32 fixedly carries a sprocket wheel 36 which meshes with a chain 38 which also meshes with a sprocket wheel 40 fixed on a rotary shaft 42 supported for rotary movement by a bearing carried by one of a pair of parallel vertically extending side frame members 44.

This rotary shaft 42 also fixedly carries a sprocket wheel 46 driven by a chain 48 from any suitable motor, so that in this way the gear 30 can be driven in a clockwise direction, as viewed in FIG. 1, to transmit the drive simultaneously to the several gears 28 all of which thus turn simultaneously in counterclockwise directions, as shown by the arrows in FIG. 1.

The pair of side frame members 44 also support for rotary movement a guide roller 15 which guides a sheet of backing material 52 against which is placed a sheet 54 of fabric or the like which is to be printed. The pair of sheets 52 and 54 are guided around a pair of additional rollers 58 and 60 in the manner shown most clearly in FIG. 1. These guide rollers 58 and 60 extend between and are carried by side frame members 56 which are respectively carried by the side standards 12 and which serve to support the side frame members 44. These side frame members 56 also serve to support and guide an additional guide roller 62 around which the sheets 52 and 54 pass directly into engagement with the drum.

The pressure with which the sheets 52 and 54 are applied against the drum can be regulated by the pressure of which the guide roller 62 is urged toward the drum axis, which coincides with the axis of the shaft 32 and which is the axis about which the several rotary screen printing assemblies of the invention are distributed.

For this purpose the roller 62 has reduced ends 64 guided in radial slots formed in the side frame members 56. A pair of pressure shoes 66 slidably engage the reduced ends 64 and are carried at the ends of elongated threaded members 68 which extend through openings in plates 70 respectively carried by the side frame members 56 at the ends of their radial slots. Lock nuts 72 adjustably fix the members 68 so as to adjust the pressure of shoes 66 against the ends 64 of the roller 62.

After passing around the drum the printed material travels to any suitable drier to the like after extending along and being guided by the uppermost guide roller 74 which is carried by the side frame members 44, as shown in FIGS. 1 and 2.

The elongated hollow screen 24 of each rotary screen assembly of the invention forms no part of the present invention and is simply an elongated rigid cylindrical screen member having open ends. It may be made of any suitable material such as Phosphor bronze, and in well-known manner it is rendered permeable to the coloring material according to a predetermined pattern.

The elongated inner supported means 22 of each rotary screen assembly extends coaxially along the interior of each cylindrical screen 24 and has the free ends 20 projecting beyond the screen 24. These free ends 20 are in the form of elongated hollow metal tubes which are coaxially arranged in a position extending through the ends of each cylindrical screen 24 coaxially therewith.

A pair of blocks 76 of any suitable metal are respectively formed with openings which receive the inner ends of the tubular free ends 20 (FIG. 9), and these blocks 76 are fixed in predetermined angular positions with respect to the ends 20, for a purpose described below. The inner support means 22 further includes a pair of elongated rigid plate members 80 fixed, as by screws 82, to the blocks 76 and extending therebetween in the manner shown most clearly in FIG. 6, so that in this way an elongated rigid inner support structure is provided.

A pair of relatively short I-beam sections 84 are situated between the pair of plates 80 and are fixed hereto as by any suitable screws. Also, an additional pair of I-beam sections 86 (FIG. 7) are fixed to the plates 80 between the latter at substantially central portions thereof, so that in this way the combination of the I-beam sections 84 and 86 together with the plates 80 form a rigid structural assembly fixedly carried by the blocks 76 which in turn are fixedly carried by the tubular free end portions 20 of the inner support means 22.

A pair of end adjusting means 18 are respectively connected with an support the pair of ends 20 of each inner support means so as to be capable of adjusting each end of each rotary screen assembly both tangentially and radially with respect to the drum axis. The details of each end adjusting means 18 are illustrated in FIGS. 3 to 5.

Each end adjusting means includes a nut 88 which is threaded onto a rotary screw 90. Each rotary screw 90 is supported for rotation by a pair of end blocks 92 fixed between the pair of guide blocks 16, and these guide blocks guide the nut 88 for movement along the axis of the screw 90, in the manner shown most clearly in FIGS. 4 and 5. The rotary screw 90 has a non-circular end 94 capable of receiving a suitable wrench or crank so that the screw 90 can be turned to displace the nut 88 along the guide blocks 16.

A pair of end plates 96 (FIG. 4) are respectively fixed to the opposite ends of each nut 88, and a slide block 98 is guided between the end plates 96. This slide block 98 is provided at its lower side with a pair of oppositely inclined wedge surfaces 100. These wedge surfaces 100

are respectively slidably engaged by similarly inclined surfaces of a pair of wedge members 102 formed with oppositely threaded bores passing therethrough. A screw 104 has oppositely threaded portions engaging the oppositely threaded bores of the wedge members 102. This screw 104 is supported for rotary movement by a central tongue portion of the nut 88 as well as by the end plates 96, and it has a non-circular free end also adapted to receive a suitable wrench, so that by threading the screw 104 the wedge members 102 will be displaced in opposite directions to displace the slide block 98 tangentially with respect to the drum axis.

The curved surface of the slide block 98 which engages the end 20 forms part of a cylinder, as shown in FIG. 4. In addition it has a tongue or key portion 106 received in a groove formed in the exterior of the end 20, as shown most clearly in FIG. 5. A clamp 108 extends around the shaft 20 and can be fixed to the end plates 96 by the screws 110. Thus, upon loosening of the screws 110 it is possible to turn the screw 104 so as to move the wedge members 102 toward or away from each other, thus adjusting the block 98 and the end 20 thereof tangentially with respect to the drum axis.

Once the adjustment is completed the screws 110 can be tightened. The operator can turn the screw 90 as to provide radial adjustment of the entire end of the rotary screen assembly, and in this way both radial and tangential adjustment of each end of each rotary screen assembly with respect to the drum can be provided.

The drive which is transmitted from the common gear 30 to the several pinions 28 which mesh therewith includes not only a pinion 28 for each rotary screen assembly but also a pair of end plates which are fixed to and support the ends of each hollow cylindrical screen 24. One of these end plates 112 is shown in FIG. 9. An identical end plate is situated at the other end of the hollow screen 24. Each end plate 112 is supported for rotary movement with respect to a sleeve 114 carried by each end 20 of each support means 22. Suitable ball bearings 116 or the like support each end plate 112 for free rotary movement with respect to sleeve 114. These end plates 112 fixedly carry at their exterior peripheries supporting rings 118 through which set screws 120 pass. These screws 120 extend through openings of the screen 24, so that in this way each screen 24 is fixed to a pair of end plates 112 for turning movement therewith.

In addition, each pinion 28 is fixed by a series of screws 122 to the end plate 112 located next to each gear 28, so that in this way rotation is transmitted to each screen 24 for turning the latter with respect to the stationary inner support means 22 of each rotary screen assembly.

Each gear 28 has a hollow extension 123 which supports for rotary movement a worm 124 having a free non-circular end accessible to the operator so that with a suitable wrench or crank the worm 124 can be turned. This worm 124 turns with each gear 28 but cannot move axially with respect thereto and is only supported for rotation about its axis by the extension 123 of each gear 28. Each worm 124 meshes with a worm wheel 126 fixedly carried by the end plate 112 which is next to the gear 128. In addition, the screws 122 are only threadedly connected with the end plate 112. They extend through arcuate slots 128 formed in each gear 28 and extending along a circle whose center is in the axis of the hollow tubular shaft portion 20. Therefore, when the screws 128 are loosened it is possible by turning the worm 124 to provide for circumferential adjustment of each screen 24, after which the screws 122 are tightened, and now the gear 128 and the plate 112 shown in FIG. 9 will rotate as a unit. In this way it is possible to provide for circumferential adjustment of each screen 24.

Each sleeve 114 is provided with exterior threads 130 as well as with an axial slot 132 (FIG. 9). A guide ring

134 surrounds but is not threaded with the sleeve 114. This guide sleeve 134 has a key portion 136 situated within the slot 132. For example, the key 136 can initially be separate from the ring 134 and joined thereto after the parts are assembled as by being welded with the ring 134.

The key portion 136 together with the remainder of the ring 134 are formed with a bore which receives a pin 138 which extends into a bore of the end portion 20 of the support means, so that in this way the ring 134 together with the key 136 are fixed with respect to the shaft 20.

In addition, the slot 132 receives the head of a screw 140 which is threaded into a tapped bore formed in the elongated hollow shaft portion 20 of the support means.

Between each guide ring 134 and screw 140 is located a rotary nut 142 which is maintained at the position illustrated in FIG. 9 by the guide ring 134 and the nut 140. Thus, when the nut 142 is turned, by cooperation with threads 130 the sleeve 114 will be axially shifted along the shaft 20, with the result that the end plate 112 together with the gear 28 and all of the structure carried thereby will be shifted along the shaft 20. As may be seen from FIG. 2, the gear 30 is considerably thicker than the gears 28 so that during axial adjustment the gears 28 will remain in mesh with the gear 30.

The axial adjusting structure shown in FIG. 9 is duplicated at the opposite end of the rotary screen assembly. In order to make an axial adjustment the screws 120 at one end of the screen 24 are removed and the adjusting means at the other end is actuated until the desired axial adjustment is achieved. Then the end plate 112 which has been disconnected from the screen 24 is correspondingly shifted axially until its openings are aligned with the openings at the end of the screen 24 and the parts are again connected together. In this way it is possible to carry out axial adjustment of each screen 24.

The coloring material is in the form of any conventional ink or paste having a suitable color. This paste is supplied to the interior of each screen by way of a supply conduit 144 (FIG. 6) fixed to the hollow tubular end 20 of each assembly which is distant from the drive gear 28. A suitable structure 146 removably fixes each supply tube 144 in a position extending through the right tube 20 of each support means, as viewed in FIG. 6. At its outer end each tube 144 is fixed in any suitable way with a hose 148 connected with a supply of the paint or the like.

At its inner end, as shown most clearly in FIGS. 7 and 8, the tube 144 terminates in a discharge nozzle 150 which directs the coloring material against a flat surface portion 152 of the support means 22. In this way, the coloring material will distribute itself along the surface 152 before reaching the inner surface of the screen 24, and thus undesirable splashing or excessive concentrations of coloring material are reliably avoided.

The coloring material is distributed along the inner surface of each screen 24, longitudinally thereof, by a rotary distributing roller 154 (FIGS. 8 and 9) which turns by frictional engagement with the inner surface of the screen 24. Each distributing roller 154 has a pair of free ends 156 of reduced size extending through slots 158 whose width corresponds to the diameter of the reduced ends 156 so that the latter can slide along the slots 158 toward and away from the axis of the screen 24.

Each slot 158 is formed in a block 160 which is fixed to a plate 162 which is in turn fixed by screws 164 to the block 76, as shown in FIG. 9. As was indicated above, the blocks 76 are fixed to the end portions 20 in a predetermined angular position, and this angular position is such that each distributing roller 154 engages the inner surface of each screen 24 precisely along the line of engagement between the screen 24 and the fabric which is printed. Thus, the axis of each roller 154 will be situated in a radial plane which includes the axis of the drum as well as the axis of the screen 24.

A pair of set screws 166 and 168 are respectively threaded through tapped bores of the block 160, in the manner shown in FIG. 9, so as to have their free ends situated at opposite sides of each reduced end 156 of the roller 154. These screws 166 and 168 provide limits on the radial movement of the roller 154 but do not actually engage the ends 156 thereof. They simply limit the extent to which the roller 154 can move freely toward and away from the inner surface of the screen 24.

The pressure with which the distributing roller 154 bears against the inner surface of the screen 24 is determined by the adjustable pressure means which includes a pressure roller 170 shown most clearly in FIGS. 7 and 8. This pressure roller 170 is guided for movement in notches 172 formed in the pair of I-beam sections 86. An elongated rod 174 passes freely through the roller 170 so that the latter can turn freely with respect to the rod 174.

The ends of the rod 174 have flat surfaces 176 respectively slidably guided in slots 178 formed in blocks 180 which are fixed by screws 182 to the I-beams 86 extending across the notches 172 thereof, as is apparent from FIGS. 7 and 8. These blocks 180 are formed with tapped bores which receive adjusting screws 184 which bear against the ends 176 of the rod 174, so that by adjusting the screws 184 it is possible to adjust the pressure with which the pressure roller 170 presses against the roller 154, and in this way the pressure with which the roller 154 presses against the inner surface of the screen is also adjusted.

The coloring material will flow between the roller 154 and the inner surface of the screen to be forced through the screen by the distributing roller 154, and by precisely adjusting the pressure roller 170 it is possible to control the rate with which the coloring material is fed to the fabric or other sheet material which is being printed. In this way it is possible by precise adjustment of the roller 170 to adapt the rate of feed of the coloring material to the speed of movement and characteristics of the sheet material which is printed, so that without possibility of crushing the sheet material it is possible to provide an exceedingly efficient distribution of coloring material thereto maintaining as bright colors at the end of a run as at the beginning of a run and reliably preventing any crushing or any running in of one coloring material from one screen with the coloring material from one another screen.

It is thus apparent that with the structure of the invention it is possible to easily, quickly, and precisely adjust each screen 24 in all directions as well as to adjust the rate with which the coloring material is distributed so as to provide the best possible printing.

In order to replace one screen with another it is only necessary to remove the blocks 92 (FIG. 4) from between the pair of guide members 16. These blocks 92 which carry the screws 90 are removably fixed between the pair of guide members 16, so that by unfastening the blocks 92 from the guide members 16 an entire rotary screen assembly can quickly be displaced in a radial direction away from the drum to be removed. This entire assembly can be replaced by another assembly, or once the assembly has been removed, at its end which is distant from the gear 28 it is possible to loosen the screws 110 and remove the clamped plate 108 and the slide block 98. Thereafter the screws 120 are removed so that the entire screen can be slipped from the end plates over that end plate 112 which is distant from the gear 28, and now the screen can be replaced by another screen. Then the adjusting structure for the end plate distant from the gear 28 is replaced and the entire structure is again introduced between the two pairs of guide members 16 at the ends of the assembly, so that through this quick and simple manner it is possible to expeditiously replace any screen with another screen.

As many changes could be made in the above rotary

screen printing machine, and many widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. In a rotary screen printing machine, a rotary drum and a plurality of rotary screen assemblies distributed circumferentially about and each extending axially along said drum, each of said rotary screen assemblies including an outer hollow screen, inner elongated support means extending coaxially along the interior of said outer hollow screen and having free ends which respectively project beyond ends of said hollow screen, rotary drive means turnably carried by said inner elongated support means and operatively connected with said screen of each assembly for rotating the latter, a pair of adjusting means respectively connected operatively to the free ends of the elongated inner support means of each screen assembly for adjusting each end both tangentially and radially with respect to said drum, supply means communicating with the interior of each screen for supplying coloring material thereto, an elongated roller engaging the inner surface of each screen and supported by said elongated inner support means of each assembly for free rotary movement in engagement with said inner surface, so that said roller distributes the coloring material along said screen for passage through the latter, and pressure adjusting means carried by the elongated inner support means of each assembly in the interior of the hollow screen thereof and engaging said roller for adjusting the pressure with which said roller engages the inner surface of each screen.

2. In a machine as recited in claim 1, said inner support means having a flat surface portion in the interior of the screen of each assembly, and a supply nozzle directed toward said flat surface portion for supplying coloring material which engages said flat surface portion before reaching the inner surface of said screen.

3. In a machine as recited in claim 1, each of said end adjusting means including an elongated screw supported for rotary movement, a nut through which said screw is threaded, frame structure supporting said screw for rotary movement and said nut for movement along the axis of said screw, a pair of end plates respectively fixed to opposite ends of said nut, a slide block slidable between said end plates and supporting a free end of said inner support means, said slide block having oppositely inclined surfaces directed toward said nut, a pair of wedge members slidably engaging said oppositely inclined surfaces with wedge surfaces having the same inclination as said oppositely inclined surfaces, respectively, and an elongated rotary screw member carried by said end plates, extending therebetween, and having oppositely threaded portions extending through and threaded to said wedge members so that upon turning of the later rotary screw member said wedge members will be moved toward or away from each other for adjusting the position of said slide block between said end plates, said wedge members displacing said slide block tangentially with respect to the drum axis and said first-mentioned rotary screw when turned displacing said nut and all of the structure carried thereby radially with respect to said drum, and a clamp threadedly connected to said end plates for releasably clamping each end of said elongated inner support means to said slide block.

4. In a machine as recited in claim 1, said drive means including a pair of rotary end plates supported for rotary movement by said elongated inner support means of each assembly in the region of said free ends thereof and directly carrying and fixed to said screen of each assembly, and a drive gear coaxially fixed to one of said end plates of each assembly, and angular adjusting means operatively connected with said drive gear and said one

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end plate of each assembly for adjusting the angular position therebetween, so that the circumferential position of each rotary screen can be adjusted.

5. In a machine as recited in claim 4, said elongated inner support means of each assembly supporting said drive means and said screen therewith for axial movement, and axial adjustment means carried by each support means and operatively connected with said drive means and through the latter with said screen for axially adjusting said screen, so that each screen of each assembly can have its position axially adjusted.

6. In a machine as recited in claim 1, said elongated inner support means of each rotary screen assembly supporting said drive means and through the latter said screen of each assembly for axial movement, and axial adjusting means carried by each elongated inner support means and operatively connected with said drive means of each assembly for axially adjusting the position of said drive means and said rotary screen therewith along the axis of the latter, whereby each screen can be axially adjusted with respect to said drum.

7. In a machine as recited in claim 1, said supply means including a flat surface which forms part of said support means of each assembly and a supply nozzle directing the coloring material against said flat surface before the coloring material reaches the inner surface of said screen.

8. In a machine as recited in claim 1, said pressure adjusting means including a pressure roller situated between said distributing roller and the axis of said screen, and a pair of adjusting screws carried by said inner support means and cooperating with said pressure roller for adjusting the pressure with which the latter engages said distributing roller.

9. In a machine as recited in claim 1, an elongated

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sleeve slidable along each end of said elongated inner support means of each assembly, said sleeve being formed with an elongated slot passing therethrough, a key fixed to each end of said support means and situated in said slot so that said sleeve can move axially but cannot turn with respect to said free end of said support means, said sleeve being exteriorly threaded, a rotary nut threaded onto said sleeve and slidably engaging said key, a screw extending through said slot into said free end of said support means and engaging an end of said nut distant from said key, so that said nut turns between said screw and key to axially displace said sleeve, said sleeve supporting said rotary drive means for free rotary movement so that upon axial adjustment of said sleeve said drive means and the screen carried thereby will also be axially adjusted, whereby said screens of said assembly can be axially adjusted with respect to said drums.

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