P. H. McGIEHAN.

MACHINE FOR PRINTING CARPETS, FLOOR RUGS, &c.

APPLICATION FILED OCT. 13, 1917. RENEWED OCT. 22, 1919.

1,338,785. **Patented May 4, 1920.**

5 SHEETS—SHEET 1.

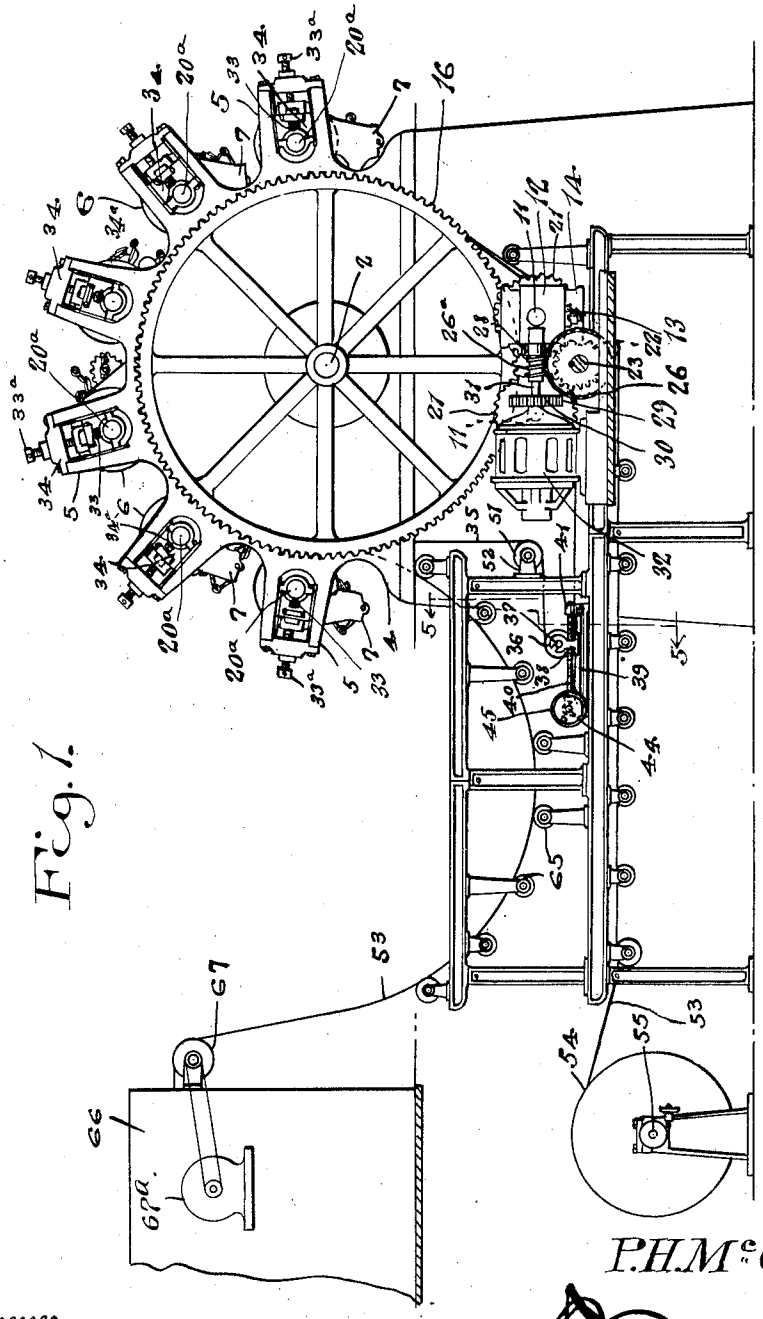


Fig. 1.

Witnesses

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T. J. Riley

Inventor

P. H. McGiehan.

By A. Landreth Jr.

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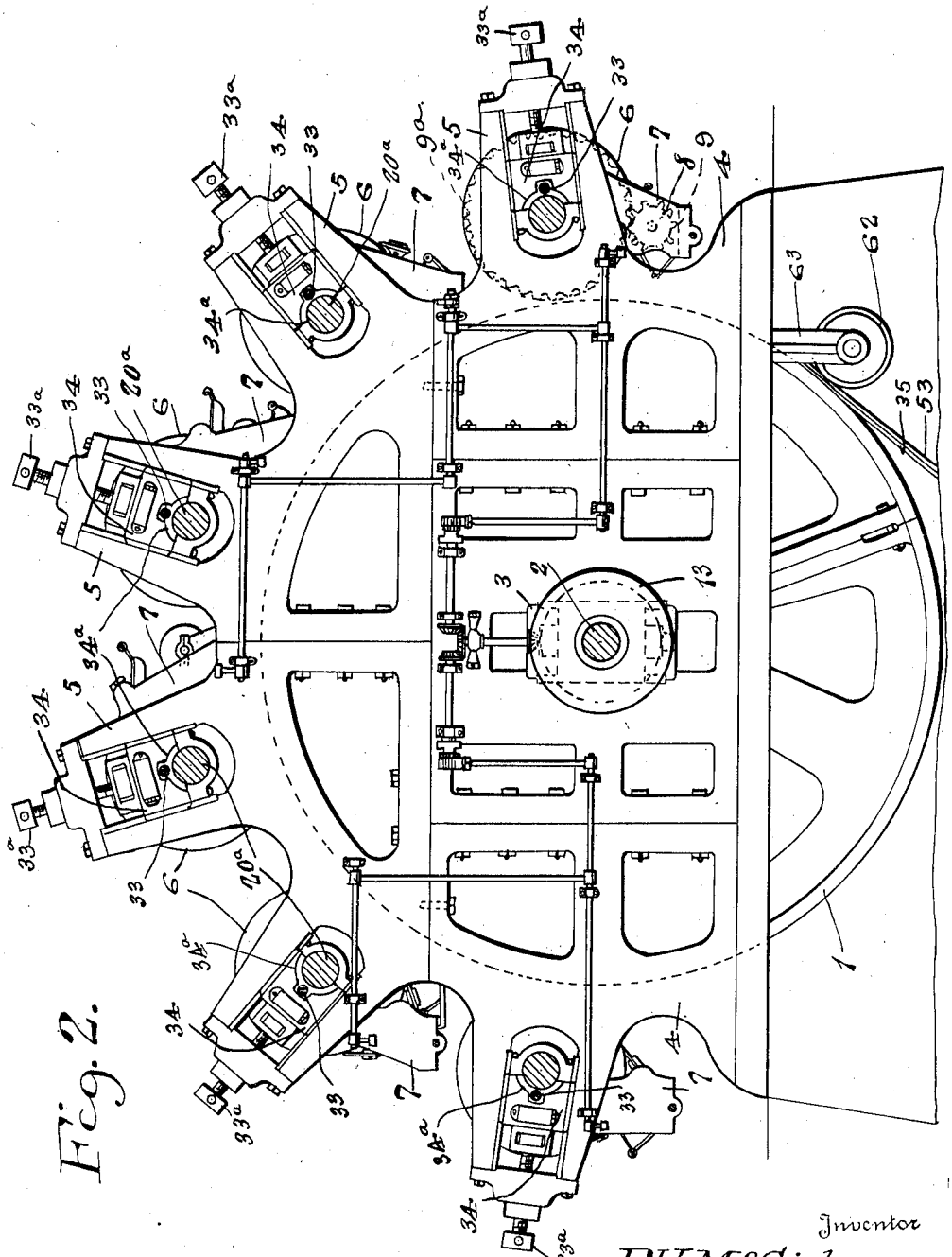


Fig. 2.

Witnesses:

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By A. L. Laudrup Jr. Attorney

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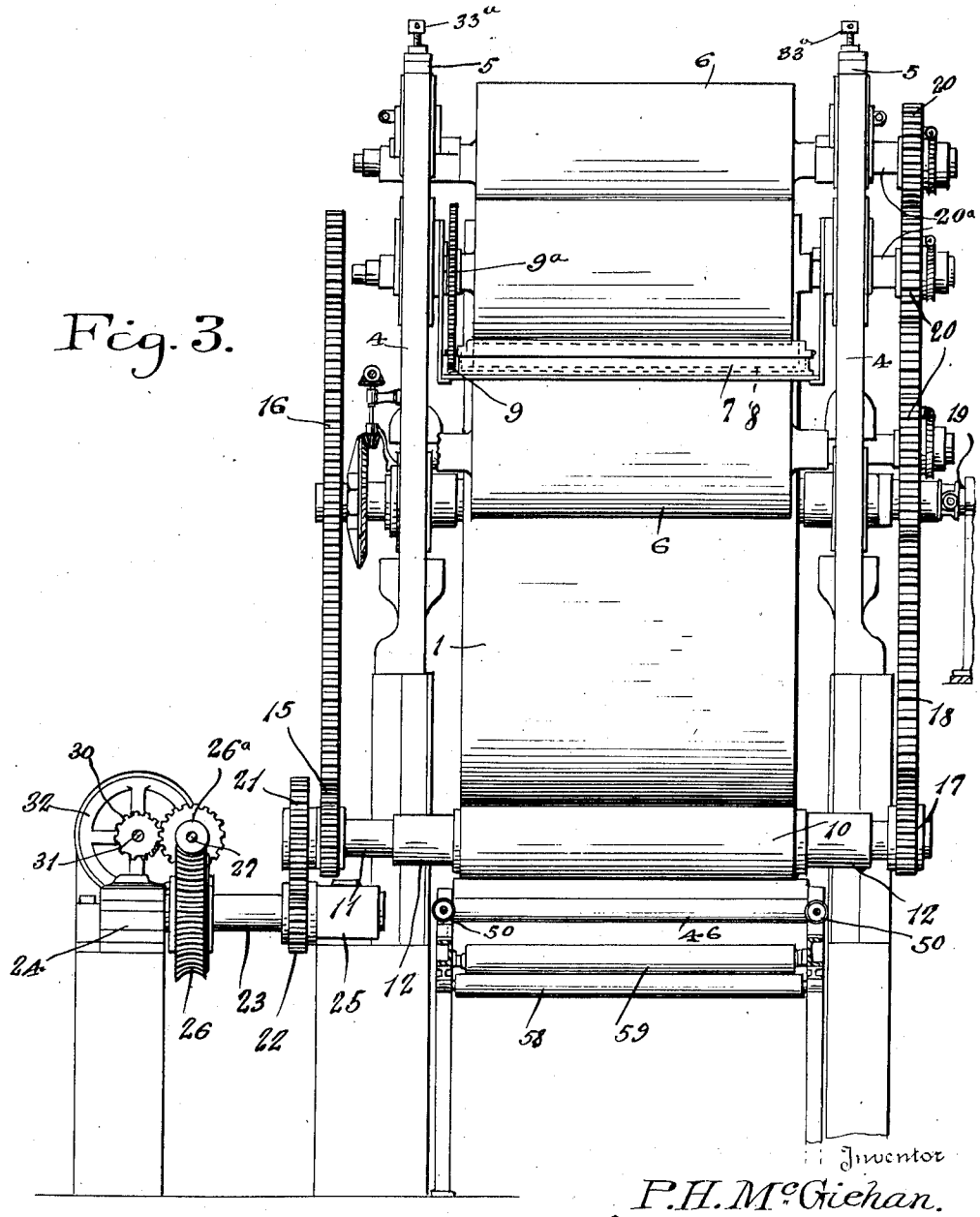
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses.

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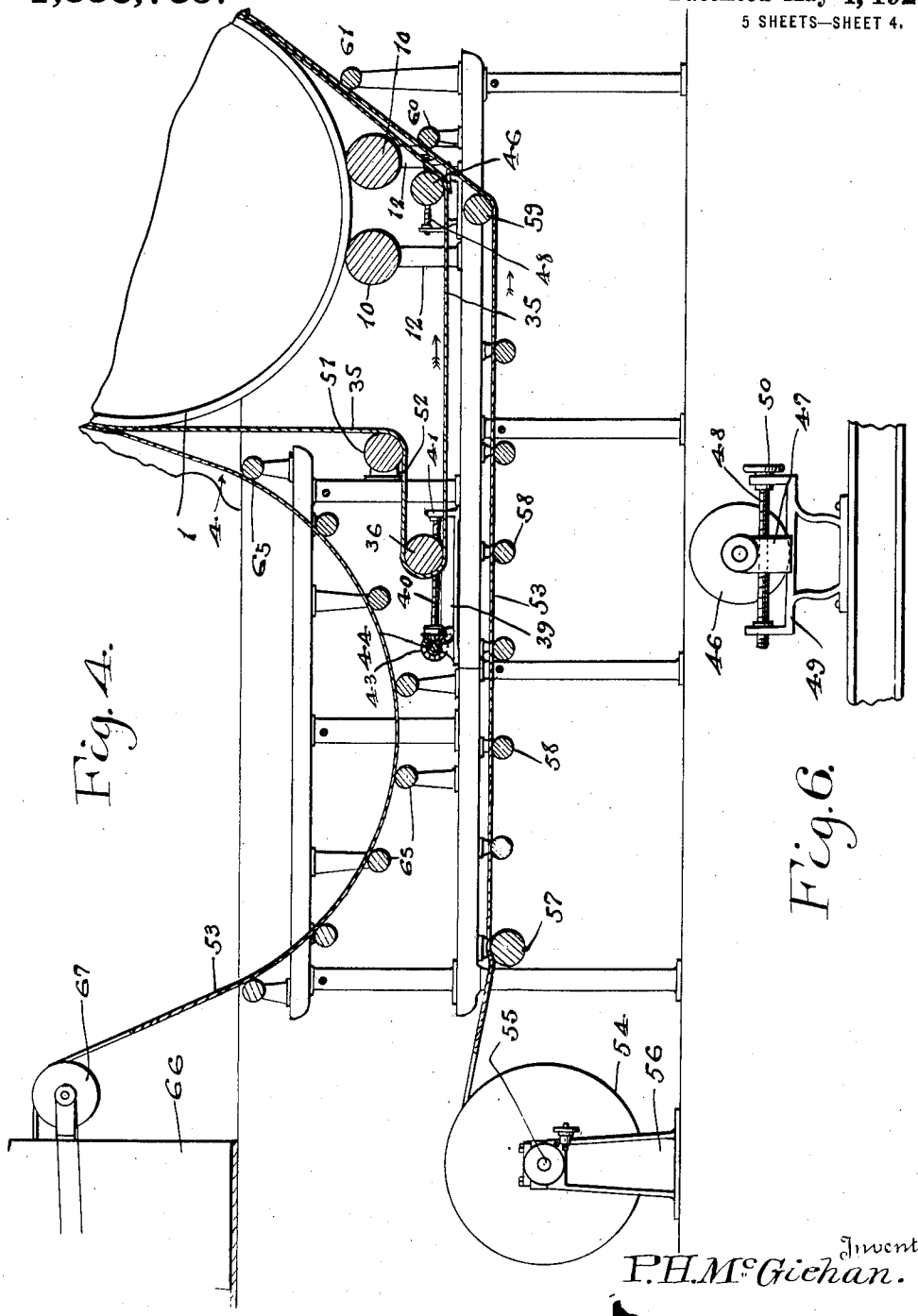


Fig. 4.

Fig. 6.

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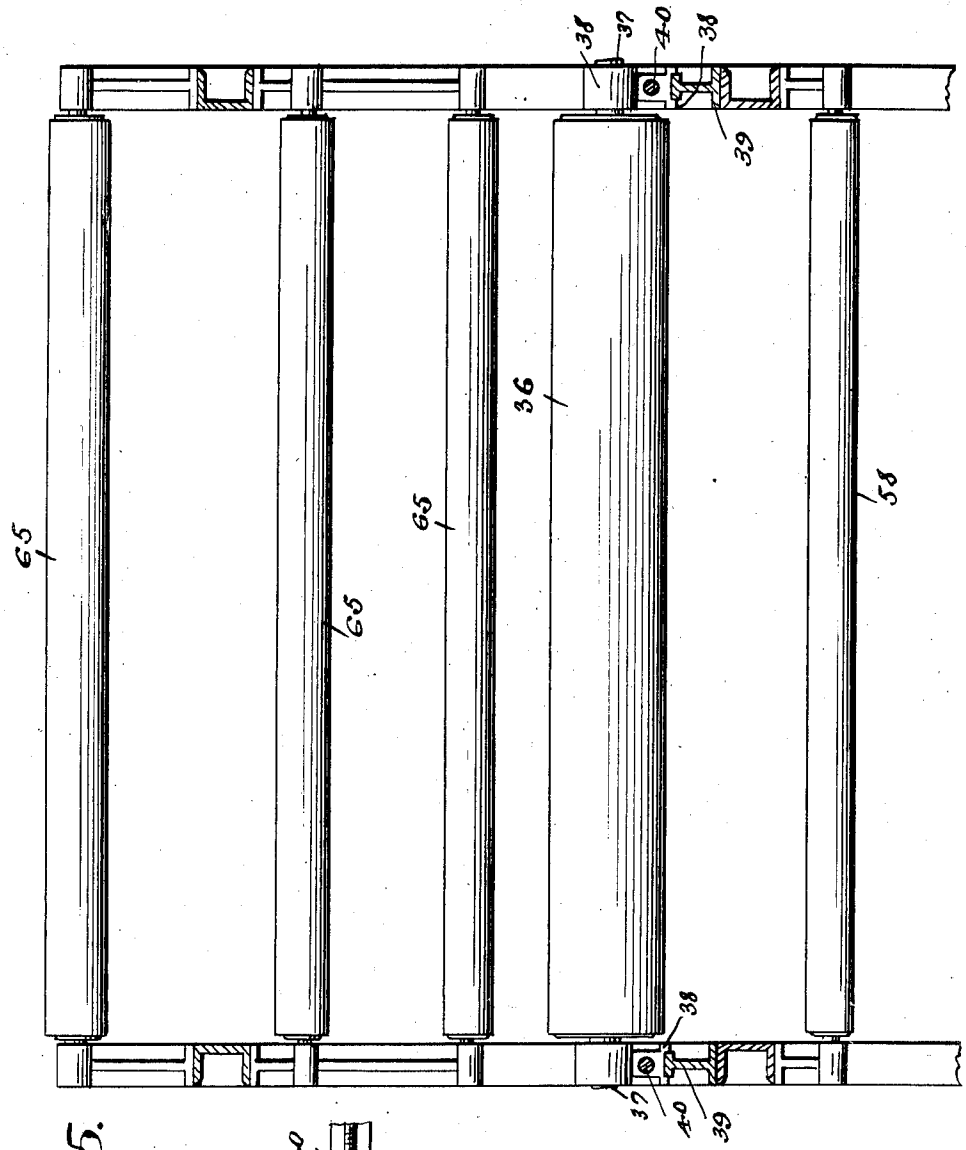


Fig. 5.

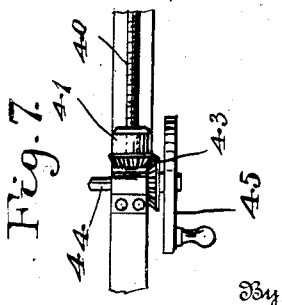


Fig. 7.

Witnesses:—
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By A. Landreth & Co.
Attorneys

UNITED STATES PATENT OFFICE.

PATRICK H. McGIEHAN, OF NEW YORK, N. Y.

MACHINE FOR PRINTING CARPETS, FLOOR-RUGS, &c.

1,338,785. Specification of Letters Patent. Patented May 4, 1920.

Application filed October 13, 1917, Serial No. 196,405. Renewed October 22, 1919. Serial No. 332,547.

To all whom it may concern:

Be it known that I, PATRICK H. McGIEHAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Machines for Printing Carpets, Floor-Rugs, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a machine for printing large carpet, floor rugs and the like.

Heretofore it has been the practice to print relatively narrow strips of carpet and similar textiles and sew the strips together to provide a rug of the required size, and this invention has for its object to provide a simple, practical and efficient printing machine of comparatively inexpensive construction adapted to print the entire design of large rugs, such as nine by twelve feet and other sizes and to enable such material of the complete width of the finished rug to be continuously run through the machine and printed in various colors from the web, thereby obviating the necessity of printing such rugs in several separate and distinct operations and then matching and sewing the strips or sections of the rug together and at the same time enabling rugs of greater artistic appearance to be produced in less time and at a much lower cost than heretofore.

As the size and weight of the printing rollers of the machine are necessarily increased to such an extent as to prevent accurate and effective operation in their usual positions below the main cylinder, it is also an object of the present invention to enable the printing rollers and other parts to be made the required size and weight without affecting the alinement of the rollers and the proper positioning of the same with relation to the main cylinder or platen by having the printing roller above the horizontal center of the main cylinder.

A further object of the invention is to provide driving means adapted to assist in supporting the weight of the main cylinder or platen and capable of adjustment to vary the pressure and adapted also to produce a uniform rotation of the printing rollers and the main cylinder or platen so that accurate printing with the increased size of the cylinder and the printing rollers may be obtained.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 is a side elevation of a carpet and rug printing machine constructed in accordance with this invention.

Fig. 2 is an enlarged side view of a portion of the machine, the gear of the main cylinder being removed and the shaft thereof being in section.

Fig. 3 is an end elevation partly in section.

Fig. 4 is a longitudinal sectional view through the carrying rollers and the tensioning device of the endless blanket.

Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a detail view illustrating the adjustable guide roller of the blanket, tensioning device.

Fig. 7 is a detail view of the operating means of the blanket tensioning device.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In the accompanying drawings, in which is illustrated the preferred embodiment of the invention, the machine, which is designed for printing large rugs, carpet and the like, comprises in its construction a main cylinder or platen 1 mounted upon a horizontal transversely disposed shaft 2 which is journaled in suitable bearings 3 of a main frame having sides or side frames 4. The bearings 3 are vertically adjustable and the main frame, which may be of any desired construction, is provided at the upper portions of the side frames with radially projecting arms or nips 5 in which are mounted printing rollers 6 which are located at the top of the frame in order that their weight may maintain them in proper alinement with the main cylinder or platen. By this arrangement, the main cylinder or platen

and the printing rollers may be made of any required size and weight and there will be no liability of the printing rollers sagging or otherwise getting out of alinement with the main cylinder or platen through such excessive weight of the rollers, as is the case when heavy rolls are located below the main cylinder or platen in the position occupied by the printing rollers of relatively small fabric printing machines like those in present use. The arms or nips are of substantially the ordinary construction and the printing rollers are supplied with colors from color boxes 7 by means of furnisher rolls 8 which are connected or meshed with the printing rollers by gears 9 and 9a, one furnisher gear being fixed on the shaft of the furnisher roller, and the other furnisher gear 9a of the shaft of the printing roller.

The main cylinder or platen is arranged to have carrying or rotating support upon a pair of horizontally disposed rolls 10 having shafts 11 which are journaled in adjustable bearings 12. The bearings 12 or bearing boxes are vertically adjustable by means of screws 13 and they are mounted in suitable guides 14 of the sides of the main frame. By adjusting the rollers, the pressure may be increased or decreased and the said rollers will assist in supporting and rotating the main cylinder or platen and are located at opposite sides of the center of the bottom of the same. The shafts 11 of the adjustable horizontally disposed supporting and driving rollers are equipped at their left hand ends in Fig. 3 of the drawings with pinions 15 which mesh with a main cylinder gear 16 which is keyed or otherwise secured to the horizontal shaft 2 of the cylinder or platen 1 and the said shafts 11 are provided at the right hand ends in Fig. 3 of the drawings with pinions 17 which mesh with an intermediate gear wheel 18 mounted on a stud 19 and adjustable to accommodate larger or smaller intermediate gear which is necessary when the diameter of the printing rollers are changed. This intermediate gear 18 meshes with fitting gears 20 of the printing rollers 6. This gearing of the ends of the horizontal supporting and driving rollers 10 with the main cylinder gear and the intermediate gear produces a positive and steady drive and will eliminate any jerking and a uniform speed will be transmitted to the cylinder and the printing rollers, while the adjustment of the lower supporting and driving roller will produce a floating effect for the main cylinder or platen.

The supporting rollers 10 may be constructed of cast iron or other suitable material and the shafts 11 are also provided with gears 21 which mesh with a pinion 22 located beneath the gears 21 and mounted on a relatively short worm wheel shaft 23. The worm gear shaft 23, which is journaled in suitable bearings 24 and 25, carries a worm wheel 26 keyed or otherwise secured to the shaft 23 and meshing with a worm 26a of a horizontally disposed worm shaft 27, which is mounted in suitable bearings 28. The worm shaft 27 also carries a pinion gear 29 constructed of rawhide or other suitable material at its engaging portion and meshed with or engaging a similar pinion 30 mounted on the shaft 31 of an electric motor 32, but any other suitable form of motor may of course be employed for operating the printing machine. The pinion and the worm gearing provide a simple and efficient means for transmitting motion to the gearing which connects the heavy adjustable supporting rollers which assist the rotation of the main cylinder and assure the same peripheral speed in the main cylinder and the printing rollers.

The fitting gears, which are arranged at the ends of the printing rollers at the right hand side of the machine, are mounted on the shafts or mandrels thereof in the usual manner so that the rollers can be turned in either direction for the purpose of fitting the pattern to be printed on the goods or material, each printing roller printing a separate or different color in accordance with the design of the pattern. The engraving in each printing roller is different as each roller is to print a separate color to form a complete six color pattern or design. The fitting gears are so constructed to enable the operator to turn any of the six rollers slightly one way or the other without rotating the intermediate gear or the toothed portion of the fitting gear so that the color of the design printed by each roller will fall in its relative position with the other colors and will thereby form and print the design in accordance with the pattern engraved on the printing rollers. For the sidewise motion or adjustment to fit the pattern sidewise there will be post-head screws 33 provided in the outer sides of the head blocks 34. The post-head screws engage the printing roller sliding bearing or brass 34a so that by releasing the screw in one side of the machine and tightening up the screw in the block at the opposite side of the machine, the entire printing roller can be moved sidewise in either direction, thus fitting the pattern sidewise. The head blocks are adjusted by pressure screws 33a which are for the purpose of applying additional pressure to the printing rollers for drawing back or lessening the pressure as may be required in getting a proper impression.

Around the main cylinder or platen is an endless cotton or woolen blanket 35 which is also arranged on an adjustable tension roller 36. The adjustable tension roller 36

is mounted in open bearing recesses 37 of adjustable bearings 38 slidably mounted upon a suitable support and guide 39 and moved backwardly and forwardly along the same in a direction longitudinally of the machine by means of adjusting screws 40 threaded through the said bearings 38 and mounted in suitable bearings 41. The longitudinally disposed adjusting screws are connected by suitable gearing 43 with a transverse operating shaft 44 equipped with a hand wheel 45 or other suitable means for operating the adjusting screws to regulate the tension of the blanket. The blanket extends from the tension roller to an adjustable guide roller 46 located beneath the main cylinder and mounted in slidable bearings 47 which are adjustable by screws 48. The screws 48 are journaled in suitable brackets 49 and are equipped at one end with a hand wheel 50 for adjusting the tension and guide roller. The blanket passes beneath the adjustable guide roller in a direction indicated by the arrow in moving toward the main cylinder, and when it leaves the main cylinder at the back thereof it passes beneath a guide roller 51 mounted in fixed bearing brackets 52. The guide rollers 46 and 51 and the tensioning roller 36 form a tensioning loop in the endless blanket at the bottom of the main cylinder and the blanket is arranged at an inclination from the guide roller 46 to the cylinder.

The goods or material 53 to be printed is arranged in the form of a roll or web 54 which is mounted on a shaft or spindle 55 and the latter is journaled in a suitable stand or frame 56 located at one end of the printing machine. The material passes over horizontally alined carrying rolls 57 and 58 to a guide roll 59 and it extends upwardly from the bottom of the latter over guide rolls 60 and 61 to a rubber covered roll 62 hung in suitable brackets 63 and located at the bottom portion of the main cylinder and adapted to press the goods or material 53 against the blanket with sufficient force to enable the main cylinder or platen to feed the material to the machine by drawing the material from the roll 54. The printing rollers, pressing against the main cylinder or platen, will draw the goods to the machine and the goods will be laid on the top of the blanket and carried by the rotation of the cylinder around the same between the said cylinder and the printing rollers to print the various colors at the points of contact with the said printing rollers. The printed goods, after leaving the last printing roller, passes downwardly over an arcuate series of carrying rolls 65 located above the carrying rolls 58 and enabling the said printed material to be carried printed side up to a drier 66 having a large driven roll 67 at the front thereof as clearly shown in Fig. 4 of the drawings. This driven roller 67, soft rubber covered, will be driven, by a motor 67^a or in any other suitable manner, to rotate at the same peripheral speed as the main cylinder or platen. When the goods have passed through the drier, having been printed and dried, they are then cut off at the proper points or center of margin between the printed designs and are hemmed, thus completing the rugs in large sizes such as nine feet by twelve feet in a single operation.

The machine may be made of any desired size and any required number of colors may of course be provided and, owing to the particular arrangement of the arms or nips and the printing rollers above the horizontal axis or center of the main cylinder or plates, the very large and heavy printing rollers will be prevented from springing and will be caused to be maintained in perfect alinement by their weight. This arrangement with the adjustable supporting driving rollers and the means for rotating the same and the main cylinder or platen and the printing rollers will produce the same peripheral speed on the main cylinder and the said rollers and will cause a positive and steady drive without any jerking of the parts, thus maintaining the fit of the pattern or design being printed.

What is claimed is:

1. A machine for printing carpet, rugs and the like in large sizes with a single operation including a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, rotary means located beneath and supporting and actuating the main cylinder and the printing rollers, and means for positively rotating the said means.

2. A machine for printing carpet, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, and means for rotating the cylinder and the rollers including positively driven rotary elements located beneath the main cylinder in spaced relation and supporting and actuating the same.

3. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main

cylinder and the printing rollers, and means for rotating the main cylinder and the rollers including a rotary element located beneath the main cylinder and assisting in supporting and rotating the same.

4. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, gearing for rotating the same, means for rotating the cylinder and the rollers including a rotary element located beneath the main cylinder and supporting and assisting the rotation thereof, separate gearing for positively rotating said rotary element, and means for adjusting the rotary element to increase and decrease the pressure.

5. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, gearing for rotating the same, means for rotating the cylinder and the rollers including spaced supporting rollers located beneath and extending across the cylinder at the bottom thereof, and separate gearing for positively rotating the supporting rollers.

6. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, means for rotating the cylinder and the rollers including spaced supporting rollers located beneath and extending across the cylinder at the bottom thereof, gearing located at one end of the main cylinder and connecting the supporting rollers with the said main cylinder, and separate gearing located at the other end of the main cylinder and connecting the supporting rollers with the printing rollers.

7. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, means for rotating the cylinder and the rollers including spaced supporting rollers located beneath the main cylinder, a worm gear shaft provided with a worm wheel, gearing connecting the said shaft with the supporting and driving rollers, a worm shaft meshing with the worm gear, means for actuating the worm shaft, and gearing for connecting the supporting and driving rollers with the main cylinder and with the printing rollers.

8. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen and adapted to be prevented by the same from springing out of proper alinement, means for supporting the main cylinder and the printing rollers, means for rotating the cylinder and the rollers including spaced supporting and driving rollers located beneath the main cylinder, a worm gear shaft provided with a worm wheel, gearing connecting the said shaft with the supporting rollers, a worm shaft meshing with the worm wheel, a motor, gearing connecting the motor with the worm shaft, and gearing for transmitting motion from the supporting and driving rollers to the main cylinder and the printing rollers.

9. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder, printing rollers located at the upper portion of the main cylinder, an endless blanket arranged on the cylinder and extending from the lower portion thereof to form a loop, a positively driven roller located in the loop and supporting and actuating the cylinder, guide rolls receiving the endless blanket, and an adjustable tension roll arranged to stretch the said blanket and vary the tension thereof.

10. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder, printing rollers located at the upper portion of the main cylinder, an endless blanket arranged on the main cylinder and extending therefrom to form a tension loop, a positively driven roller located in the loop and supporting and actuating the cylinder, relatively fixed and movably mounted and adjustably mounted guide rolls arranged to receive the sides of the tension loop, and an adjustable tensioning roll arranged in the said loop and provided with means for adjusting it horizontally.

11. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder, printing rollers located at the upper portion of the cylinder, an endless blanket having a tensioning loop at the bottom of the cylinder, spaced positively driven rollers located

beneath and supporting and actuating the cylinder in a floating condition, and a roll located at the lower portion of the cylinder and arranged to hold the goods to be printed against the blanket to enable the cylinder to feed the goods into the machine.

12. A machine for printing carpets, rugs and the like in large sizes with a single operation comprising a main cylinder, printing rollers located at the upper portion of the cylinder, an endless blanket having a tensioning loop at the bottom of the cylinder, a roll located at the lower portion of the cylinder and arranged to hold the goods to be printed against the blanket to enable the cylinder to feed the goods into the machine, a horizontal series of carrying rolls for supporting the material to be printed, and a plurality of guide rolls located at different elevations and arranged between the series of carrying rolls and the cylinder.

13. A machine for printing carpets, rugs and the like in large sizes with a single operation including a main cylinder, printing rollers arranged at the top of the main cylinder, means for operating the same, and a series of carrying rolls arranged to receive the printed material as the same leaves the main cylinder, said carrying rolls being disposed in an arcuate series of approximately the diameter of the cylinder and so related thereto as to support the material with its printed side concave so as to avoid cracking of the impression thereon.

14. A machine for printing carpets, rugs and the like in large sizes with a single operation including a main cylinder, printing rollers arranged at the top of the main cylinder, means for operating the same, and a series of carrying rolls arranged to receive and guide the printed material with the printed surface upward as the same leaves the main cylinder, said carrying rolls being disposed in a downwardly arched series of approximately the diameter of the cylinder to guide the printed material first downwardly and outwardly from the cylinder and then upwardly, and a driven roller located above the outer end of the said series of rolls at the entrance of a drying machine for drawing and delivering the printed goods to the drying machine.

15. A machine for printing carpet, rugs and the like in large sizes including a main cylinder or platen, a plurality of printing rollers located above the main cylinder or platen and arranged to bear upon the same, whereby they will be prevented from sagging or swinging out of proper alinement, and means for rotating the main cylinder or platen and the printing rollers and separate positively driven means located beneath the cylinder and supporting the same in a floating condition.

16. A machine for printing carpet, rugs and the like in large sizes including a main cylinder or platen, a plurality of printing rollers located above the main cylinder or platen and arranged to bear upon the same, whereby they will be prevented from sagging or swinging out of proper alinement, and means for rotating the main cylinder or platen and the printing rollers and separate positively driven means located beneath and supporting and actuating the cylinder or platen in a floating condition for producing a floating effect on the main cylinder or platen.

17. A machine for printing carpets, rugs and the like in large sizes including driving mechanism, a floating main cylinder or platen actuated by the driving mechanism, and a plurality of printing rollers located above the main cylinder or platen so as to bear against the same, said printing rollers being also actuated by the driving mechanism and separate positively driven rollers located beneath and supporting and actuating the cylinder or platen.

18. A machine for printing carpets, rugs and the like in large sizes comprising a main cylinder or platen, a plurality of printing rollers located at the upper portion of the main cylinder or platen so as to bear upon the same, rotary elements located below the main cylinder or platen and adjustable to produce a floating effect on the main cylinder or platen to assist in supporting and driving the same, and gearing for connecting the rotary elements with the main cylinder or platen to provide a positive drive for the said main cylinder or platen.

In testimony whereof I affix my signature in presence of two witnesses.

PATRICK H. McGIEHAN.

Witnesses:

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AMELIA KAISER.