

(No Model.)

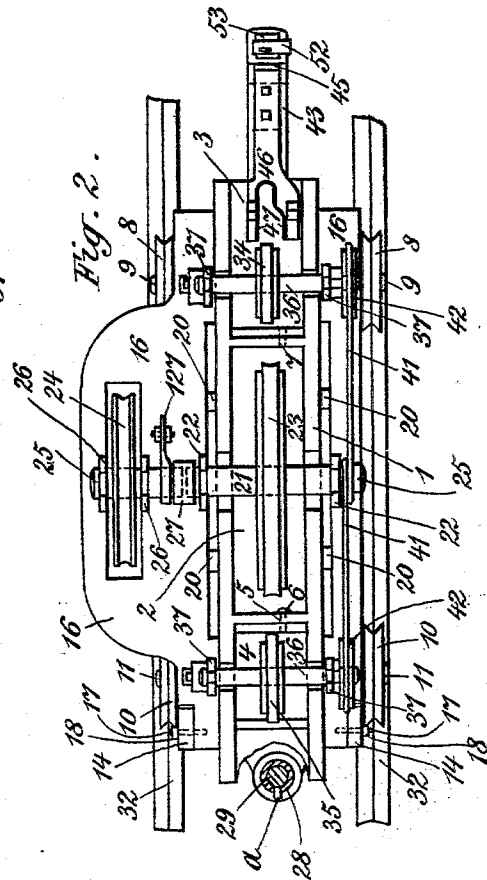
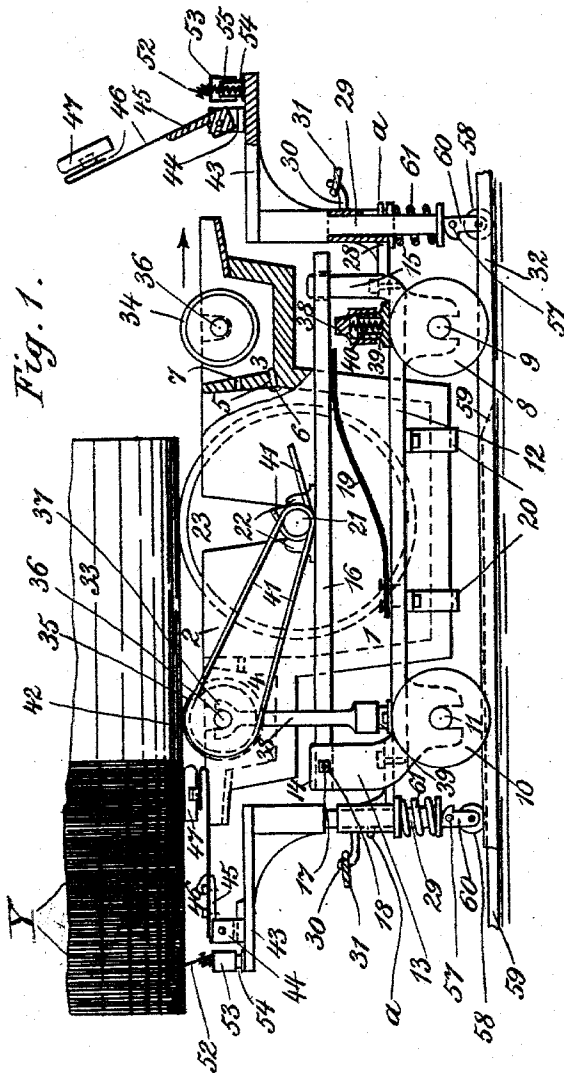
3 Sheets—Sheet 1.

W. SHAW.

APPARATUS FOR PRINTING CARPET YARNS.

No. 510,939.

Patented Dec. 19, 1893.



Witnesses:

E. T. Ryan

W. Lyman

Inventor:

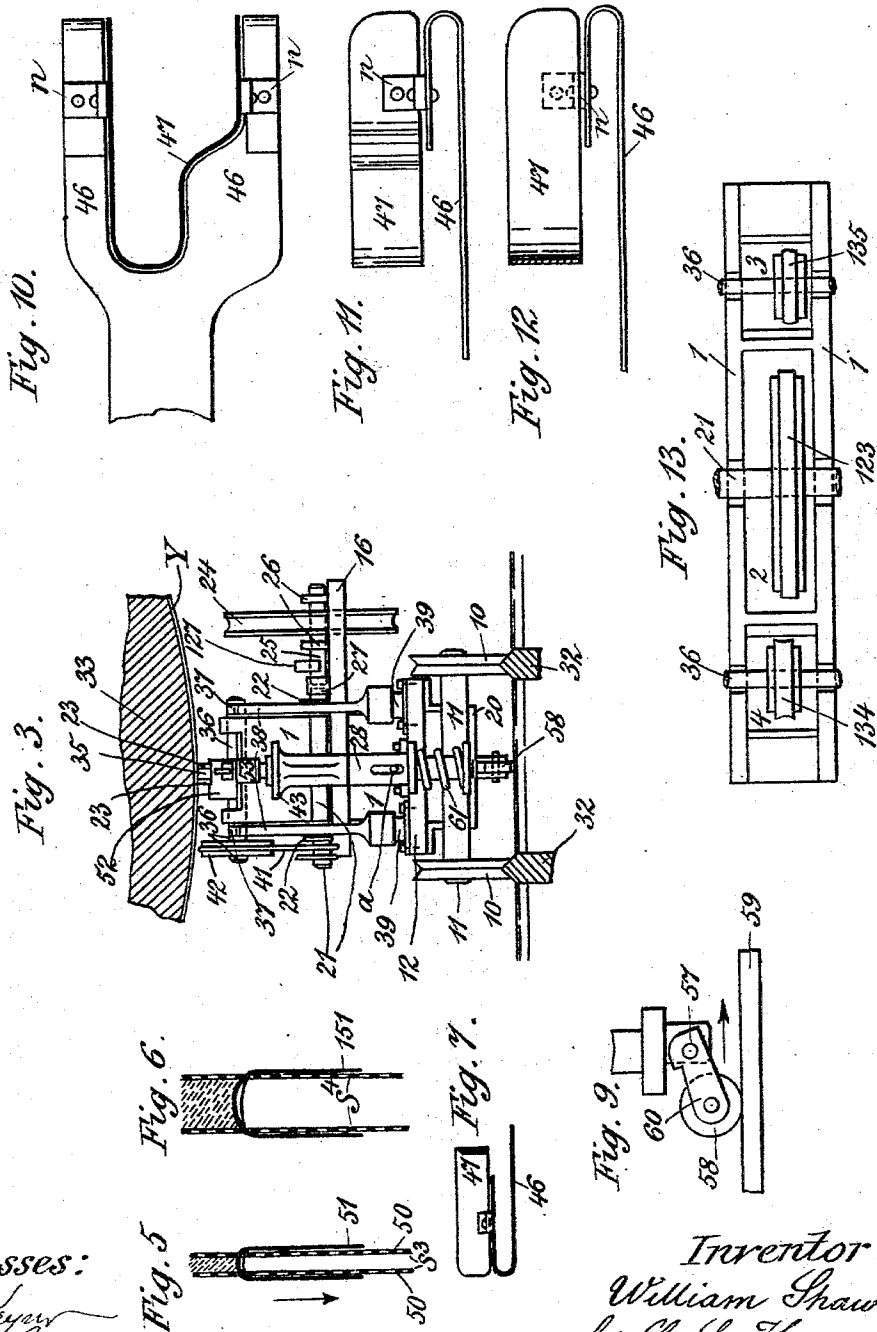
William Shaw
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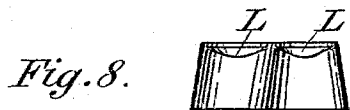
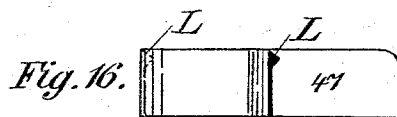
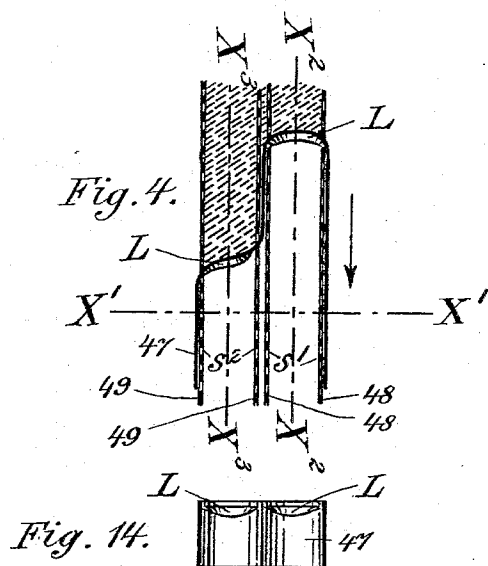
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APPARATUS FOR PRINTING CARPET YARNS.

No. 510,939.

Patented Dec. 19, 1893.



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UNITED STATES PATENT OFFICE.

WILLIAM SHAW, OF NEW YORK, N. Y.

APPARATUS FOR PRINTING CARPET-YARNS.

SPECIFICATION forming part of Letters Patent No. 510,939, dated December 19, 1893.

Application filed August 17, 1892. Serial No. 443,318. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SHAW, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Printing Carpet-Yarns, of which the following is a specification.

My invention refers to improvements in apparatus for printing carpet yarns, such as are used more particularly in the manufacture of tapestry carpets.

The purposes of my invention are to distribute the coloring matter evenly over and through the body of the yarn and for such purpose to subject the parts of the yarn which are in process of being colored to a number of treatments which will successively apply an ample amount of coloring matter to the yarn, remove the excess of such coloring matter while spreading the remaining part evenly for the full width of the streak and forcing the coloring matter so spread out into the yarn under sufficient pressure.

The apparatus employed by me in its general features, particularly as far as the color carriage and the main distributing wheel mounted thereon are concerned, resembles closely corresponding appliances very generally used heretofore in this line of manufacturing and also described and illustrated in my United States Patent No. 446,299, dated February 10, 1891, and in my pending application filed April 20, 1892, Serial No. 429,849.

In the accompanying drawings, forming part of this specification, I show an apparatus embodying said improvements, Figure 1 representing a side elevation, partly in section; Fig. 2 a ground plan; Fig. 3, an end view of the same. Figs. 4, 5, and 6 show ground plans of equalizers as employed by me; Fig. 7 a vertical longitudinal section of such an equalizer; Fig. 8 an end view of such an equalizer but with the walls sloping downward and outward, and Fig. 9 shows a side view of a detail of the apparatus. Fig. 10 shows a ground plan of an equalizer and its connections; Fig. 11 a side view and Fig. 12 a vertical longitudinal section thereof. Fig. 13 shows in ground plan a modified arrangement of the distributing wheel. Figs. 14, 15 and 16 show vertical sections of the equal-

izer illustrated in Fig. 4, Fig. 14 being laid along line X' X', Fig. 15 along line X² X² and Fig. 16 along line X³ X³. Figs. 4 to 16 inclusive are drawn to enlarged scales, the scale employed in Figs. 5, 6, 7 and 9 being about one-half of that employed in the remaining figures.

Corresponding figures and letters throughout the different views refer to corresponding parts.

1 is the box containing the liquid coloring matter. The same is divided into a number of compartments 2, 3 and 4; 2 being the deeper central compartment and 3 and 4 being end compartments having their bottoms at higher elevations than that of compartment 2. Each of the end compartments has two passages connecting it with the central compartment 2, the lower such passage located close to the bottom of the end compartment being ordinarily closed by a removable plug 6, while the upper passage 7 remains normally open.

8, 8 are a set of wheels fastened to an axle 9, and 10, 10 another set fastened to an axle 11.

12 is the main body of the carriage its under side being forked where it engages with axles 9 and 11. An abutment 13 at the end of body 12 is provided with two lugs 14, 14, while at the opposite end of said main body a vertical pin 15 is provided.

16 is the lid hinged at one end to lugs 14, 14 by set-screws 17, 17 provided with lock nuts 18, 18, its opposite end being made to loosely surround the upper end of pin 15. On each side of the carriage a spring as 19 is fastened to frame 12, so as to support lid 16 and force it upward.

Metallic straps 20, 20 are suspended from frame 12 for the purpose of supporting color box 1, which is inserted in proper openings in frame 12 and lid 16. 21 is an axle with bearings 22, 22 on lid 16. On said axle is mounted the main distributing wheel 23, so as to place the same within central compartment 2 of the color box, the central sections of the walls of such compartment being cut out and bearings 22, 22, being made open on top, thus permitting of lifting axle 21 and with it color wheel 23 out of such box, when desired.

24 is a groove pulley fastened to an axle 25

which rests in open bearings 26, 26. Said axle is placed in line with axle 21, a sleeve coupling 27 serving to normally connect said two axles in the usual manner when required.

127 is a catch hinged to lid 16 so as to keep sleeve 27 in position after the coupling has been effected.

28, 28 are castings attached to carriage-body 12 and containing vertical bearings for posts 29, 29 adjusted to slide therein. To such castings there are fastened hooks 30, 30 to which ropes 31, 31 are attached, by means of which the carriage and the printing apparatus supported by it are moved along rails 32, 32 parallel with drum 33, upon which drum the endless thread of carpet yarn indicated by Y in Fig. 1 is wound in a continuous uniform layer. While the main distributing wheel is thus being moved along said drum, it will be held in contact with the yarn by the springs 19 forcing upward lid 16 and with it bearings 22, 22, and the friction so produced between such wheel and such yarn will keep the former revolving while such contact and such movement of the carriage continue, and will cause said wheel thereby to bring up from the bottom of compartment 2 the coloring matter in which it is to be immersed which is to be applied to the yarn. It is, however, necessary to provide means for revolving distributing wheel 23 while it is traveling toward said drum and before it comes in contact with the yarn, so as to have that part of its periphery which at first comes in such contact fully supplied with coloring matter, and this is accomplished by revolving it by means of pulley 24 and axles 25 and 21 coupled together, pulley 24 being revolved by a cord in the usual manner until the coloring wheel comes in contact with the yarn and after it passes from under the drum. The effect of drawing the coloring wheel along the yarn as described will be the production of a "streak" of coloring matter on the yarn about three-eighths of an inch wide and slightly exceeding in width the face of such wheel. Owing to the pressure applied to the distributing wheel by springs 19, the greater part of such coloring matter thus deposited on the yarn will be forced outward by such wheel so as to form two ridges directly adjoining the path of such face of the wheel, while the space between such ridges will be moistened but slightly and hence coloring matter, if any deposited there, will be of a light shade and not of sufficient quantity to give the yarn there a sufficiently deep color.

Heretofore appliances substantially as described above (except that the color box contained only one compartment) have been employed. The coloring wheel having traveled once along the drum, the latter was revolved around its axis sufficiently to bring another part of the yarn, which was to receive the same shade in the path of such coloring wheel and after thus all the streaks of the same color and shade required had been made, the

color box and coloring wheel were lifted off from the carriage and a different set of them for applying a different color, or shade of color were applied. Finally after the entire surface of the yarn had thus been coated, operatives using elastic hand scrapers would force the coloring matter forming the ridges above referred to into the intervening spaces, thus equalizing as far as practicable the distribution of the coloring matter and removing any excess of the same. As this scraping of the yarn, under the circumstances, would necessarily take place some time after the application of the coloring matter thereto, such coloring matter would owing to capillary attraction, have in a measure soaked into the yarn and the scraping by hand would be only an auxiliary final step toward printing the yarn in a uniform manner.

For fully thirty years, many attempts have been made to supersede the hand scraping by machine work, particularly in order to save time and expense and secure more uniform work. However, none of the results thus obtained have proved entirely satisfactory, owing principally to the fact, that the surfaces of the drums employed are very seldom true and that the sheet of oil cloth which it is necessary to interpose between the yarn and the drum is apt to sag and wrinkle and that therefore the equalizing devices mechanically-conducted along the yarn in the path of the distributing wheel would not at all points be in proper operative contact with the yarn, and further that it has generally been attempted to accomplish the uniform distribution of the coloring matter deposited by the distributing wheel and the forcing of it into the yarn by one operation, much more attention having evidently been paid to the last named feature than to the careful spreading laterally of the coloring matter originally deposited in ridges.

By the use of the following appliances invented by me, I am enabled to produce a uniform distribution of the coloring matter and thorough union of it with the yarn.

34, 35 are additional distributing wheels inserted in compartments 3 and 4 and mounted on axles 36, 36 which axles extend outside of the walls forming such compartments and are adapted to revolve within open bearings 37, 37 which are provided at the upper extremities of posts 38, 38.

39, 39 are sockets attached to frame 12 and inclosing spiral springs 40. The lower extremities of posts 38, 38 fit over such sockets so as to slide up and down along their outer walls and to be guided by the same, in such a manner as to permit said spiral springs to so actuate said posts and the axles supported by them as to insure contact between distributing wheels 34 and 35 and the yarn on the drum, while the former are made to pass along the latter. It will be seen that each of the distributing wheels 23, 34 and 35 receives its upward pressure from an independent

spring, and that therefore, no matter how uneven the surface of the drum and of the yarn may be, proper contact between all the wheels and the yarn will thus be secured. Wheels 34 and 35 are shown to be narrower than wheel 23; hence the ridges produced by the former will run parallel with but will not cover those produced by the latter. It will be seen that by varying the widths of the distributing wheels mounted on the same carriage (or by using wheels of equal widths but not traveling exactly behind each other) as is illustrated in Fig. 13, the distributing wheels being represented by 123, 134 and 135, any desired number of ridges can be obtained during one trip of the color carriage, and further, that as the first wheel moistens the yarn, the coloring matter supplied by the wheel following behind the same will be apt to be drawn into the yarn by capillary attraction. The employment of more than one such distributing wheel will also secure a very copious application of such coloring matter. For the same reasons as mentioned with reference to wheel 23 it is also necessary to cause wheels 34 and 35 to revolve while they are traveling toward the drum, and this I accomplish by means of cords 41, 41 which engage with the forward end of axle 21 and from the same impart revolving motion to grooved pulleys 42, 42 which are attached to the forward ends of axles 36, 36.

If at any time it should be desired to limit the application of coloring matter to the yarn to only one or two distributing wheels, it is only necessary to remove one or both of plugs 6 and thereby drain the contents of compartments 3 and 4 into compartment 2.

7 represents an overflow passage for passing any excess of coloring matter from compartment 3 into compartment 2.

The upper parts of posts 29, 29 terminate in platforms 43, 43, supporting lugs 44, 44 to which on each platform is hinged a shoe 45 carrying a leaf spring 46 which extends toward the distributing wheels and has mounted near its inner end and over one of the end compartments of the coloring box an equalizer 47, consisting of a thin blade, the upper edge of which is held against the yarn in a position parallel with the drum, by said spring. Such an equalizer is shown particularly in Figs. 10, 11 and 12 to be connected with leaf spring 46 by means of angle pieces n , n riveted both to said spring and the equalizer. I prefer the use of a leaf spring for such purposes because it may be made particularly sensitive, while nevertheless securing a firm contact between the edges of the equalizer and the yarn. However, I do not confine myself to the use of such a spring.

A great many of the designs employed in manufacturing carpets call for the placing of two streaks of the same color and shade side by side, and in such cases it is either customary to run a wheel of usual width successively over adjoining spaces so as to produce thereby two streaks as shown in Fig. 4, where-

in the heavy, partly broken lines 48, 48 represent the ridges forming part of a streak S' and similar lines 49, 49 represent the ridges of another parallel streak S'' produced successively as mentioned above, or to substitute for the narrower wheel another wheel of say double the width of the former, but so mounted on its axle that when placed in an operative position one of its edges will correspond with the position previously occupied by one of the edges of the narrow wheel thus producing a streak of double width as shown in Fig. 6.

One arm of the preferred form of my equalizer, as 47, is shown to run its full length along the left hand ridge 48, while part of the other arm is shown to run between the other ridge 48 and the left hand ridge 49 and parallel to both of them, and another part of said arm runs to the right of right hand ridge 49, said two sections of said arm being joined together by a connecting piece running at an oblique angle to the aforesaid ridges as shown. Such connection is made oblique with reference to the parallel arms of the equalizer for the purpose of moving while two of the adjoining narrow streaks are to be equalized at once, the excess from the right hand streak over to the left hand streak, so as to be discharged downward from the narrow part of the equalizer adjoining its heel. As the equalizer is being drawn along the yarn the curved part connecting its arms and the oblique part connecting the sections of the irregular arm will push ahead of them the coloring matter forming the ridges, as soon as they come in contact therewith forcing the same forward and, in a measure sidewise toward the center of a streak and also toward the longitudinal arms of the equalizer and as the inner surfaces of said arms are substantially vertical (a downward and outward slope of such surfaces even being desirable as shown in Fig. 8), any surplus or excess of coloring matter will be promptly drained downward along such surfaces and discharged into one of the end compartments of the color box, to be carried upward from there and applied to the yarn again by the distributing wheel located within such compartment. The inner part of the heel of the equalizer, as well as the face of the oblique part of the irregular arm might be made to slope inward and downward sufficiently to retain a slight quantity of coloring matter there, and carry it along, so as to guard against the too sudden discharge or drainage downward of coloring matter forming the ridges before it can be conducted laterally to the center of the streak and can cover the space intervening between such ridges. This slope is indicated by L in Figs. 4, 8, 14, 15 and 16. I have found in practice that the best results are to be obtained by making the operative edges of the equalizer very thin (say of 28 standard gage) as no coloring matter will then lodge on top of said edges and they are thus made self-cleaning and smearing of the coloring matter

and widening of the streak will thereby be avoided.

I have also found that with an equalizer of a conformation as shown in Figs. 4 and 10 either a single or a double streak may be equalized, the oblique connection of the parts forming the irregular arm being particularly adapted to push ahead of it and laterally toward streak S' any coloring matter forming part of streak S². However, I have found that, assuming streak S' should contain say yellow coloring matter and S² blue coloring matter, (the latter previously scraped,) no mixing of the two colors will occur by the use of an equalizer as 47. Where designs of carpets are being reproduced which call for single streaks of coloring matter only, a symmetrical equalizer as 51 may be employed, while if only double streaks be called for an equalizer as 151, may be used, while an equalizer as 47 is applicable in either case.

In the equalizers shown in Figs. 4 and 6 the left hand arm is intended to run close to and outside of the ridge formed by the left hand edge of an ordinary distributing wheel of single width, so that in either of the cases illustrated the ends of the equalizer nearest the distributing wheel will be symmetrical with a distributing wheel of double the usual width and mounted in a position as specified above, the width of the equalizer being extended in the direction in which the wheel is widened.

The ridges illustrated in Fig. 5 in their position correspond with such as would be produced by a single color wheel 23; those illustrated in Fig. 4 by the same wheel making successively adjoining streaks and those in Fig. 6 a single streak made in a single operation by a color wheel widened as mentioned above. Additional ridges which might be produced by wheels 34 and 35 (made either of single or of double widths) are not shown in said figures in order to avoid complication. The ends of the upper edges of the equalizer nearest to the distributing wheel should be made to gradually slope downward, or be rounded off, so as not to cut the yarn or displace it. The result of the passage of equalizers as specified over a streak or streaks will be the production of an approximately uniform coating of coloring matter of the same width as the original streak or streaks, and a prompt discharge downward of any superfluous quantity of coloring matter forming part of such streaks. While, particularly where thin coloring matter is used, capillary attraction may be depended upon to cause such coloring matter to further soak into the yarn so as make such yarn of uniform shade throughout, it is desirable where thick coloring matter is made use of, to employ further means to force such color into the yarn, and for such purpose I mount an additional blade, or a rubber, as 52, behind each equalizer on a casing 53, which casings slides vertically outside of and along a box 54 which contains a

spiral spring 55 adapted to force casing 53 and with it blade 52 upward toward the yarn. Spring 55 should be made stiff enough to impart to blade 52 a greater pressure upward, than is produced upon equalizer 47 by leaf spring 46, as the functions of the two appliances so actuated by spring power are not identical, the equalizer serving primarily to spread out laterally the coloring matter and to drain any excess of such coloring matter downward, while the function of blade 52 is the forcing upward and into the yarn of the coloring matter spread out by means of the equalizer.

56 is a set screw operating in a proper vertical slot in blade 52 and serving to adjustably attach such blade to the supporting casing.

The shoe 45 carrying spring 46 is hinged to lugs 44 as described in order to permit of swinging said spring and the equalizer into a position as shown on the right hand side of Fig. 1 when it becomes necessary to remove a color box from the carriage. It will be seen that instead of swinging the equalizer out of the way when the color box is to be removed, such equalizer might be mounted on a suitable support adjusted to slide outward along platform 43 when the color box is to be removed.

I am aware that it has been proposed to run scrapers having surfaces extending along and parallel with the drum, over the yarn, and to thereby converge the color forming the ridges above referred to and to rub the same into the yarn by mechanical action, as mentioned for instance in United States Patent No. 264,112, which deals more minutely with this subject than any other publication known to me. However, in said patent, it is particularly specified that the "rubbers" are made concave crosswise, the concavity being greatest toward the points of the rubbers, and gradually vanishing toward their butts, and that by reason of this form of rubbing surface each rubber, when in operation, gathers toward the central line of its track the ridges of the color left upon the yarn and rubs this gathered color into the yarn with the yielding pressure of the appropriate spring.

It has clearly been the tendency of all previous experimenters and particularly also of the designer of the appliances described in said Patent No. 264,112 to apply originally just about as much coloring matter to the yarn, as it is intended shall finally become embodied in the same and to depend upon upward pressure imparted by a rubber, or other corresponding device to such coloring matter almost exclusively to produce a uniform distribution of the color, a blade or scraper usually being especially applied to the distributing wheel in order to prevent it from carrying upward toward the yarn any more than the exact amount of coloring matter to be so employed. Extensive experiments made by me in the same direction have

convinced me that proper results cannot thus be obtained, and the fact that at present the seraping of carpet yarn is being done exclusively by hand would tend to confirm this conclusion. I, on the other hand, apply the coloring matter to the yarn copiously, providing an excess of it purposely and depending upon my equalizer to simultaneously distribute the same laterally and to remove the excess of the same by downward drainage. The blades traveling ahead of the distributing wheels should be kept from contact with the yarn and for such purpose their supports 29, 29 are adjusted to slide within bearings 28, 28 as mentioned above.

a, a are pins attached to supports 29 and adjusted to move within proper slots in bearings 28, 28, so as to prevent the turning of such supports within such bearings.

57, 57 are joints provided at the lower extremities of supports 28, 28 with rollers 58, 58 journaled thereto in such a manner, that such rollers will ride on a rail 59 placed underneath drum 33, and that lever 60 forming part of such joint will be compelled to assume a vertical position underneath the support 29 which follows after the distributing wheel, thereby bringing the blades supported by it in operative contact with the yarn on the drum, as shown on the left hand side of Fig. 1, while the same lever 60 when passing underneath the drum on its return trip and moving ahead of the distributing wheels on rail 59 assumes an inclined position as shown in Fig. 9, thereby permitting of the lowering of said support and of the blades above it. The ends of rail 59 are made inclined and are so placed with reference to the ends of drum 33, that the inner end of equalizer 47 will be elevated into its proper operative position at the moment it enters the space underneath the drum. This is important as the ends of the oil cloth interposed between the drum and the yarn frequently protrude downward at the end of the drum and in such case would have a tendency, if the equalizer were elevated before reaching them, to seriously bend or break spring 46.

61, 61 are spiral springs operating between proper flanges on castings 28, 28 and supports 29, 29, so as to force the latter downward after they pass from under drum 33.

While in the drawings the yarn which is to be printed is shown to be wound around a drum in the usual manner, it will readily be seen that the leading features of my invention are equally applicable to the printing of a fabric placed on any other suitable frame.

I claim as new and desire to secure by Letters Patent—

1. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn a distributing wheel and an equalizer adjusted to follow in the path of such wheel and constructed as a two armed blade with a sharp edge in contact with the yarn and the inner surfaces of the arms made substantially vertical, for the purpose of automatically

cleaning such edge while draining the excess of liquid coloring matter downward, substantially as set forth.

2. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel and an equalizer adjusted to follow in the path of such wheel and constructed as a blade having two arms with substantially vertical inner surfaces, and a connecting piece joining together such arms and having its inner surface sloping inward and downward, substantially as set forth.

3. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, and an equalizer adjusted to follow in the path of such wheel and constructed as a blade having two arms with substantially vertical inner surfaces, and a connecting piece joining together such arms, substantially as set forth.

4. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, and an equalizer adjusted to follow in the path of such wheel and consisting of a blade having edges adjusted to extend along and across both ridges of a streak of coloring matter on the yarn and a substantially vertical drainage channel between the parts of the blade carrying such edges, substantially as set forth.

5. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, and an equalizer adjusted to follow in the path of the distributing wheel and consisting of a two-armed blade, with a substantially vertical drainage channel between such arms, substantially as set forth.

6. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, and an equalizer adjusted to follow in the path of such wheel consisting of a two armed blade with ends of the arms nearest the distributing wheel tapering downward and a substantially vertical drainage channel extending downward from the operative edges of the equalizer, substantially as set forth.

7. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel and an equalizer constructed in the form of a two armed blade, one of such arms being substantially straight and parallel with a streak and different parts of the other arm being likewise placed parallel with such streak but at different distances from the first named arm and being connected obliquely for the purpose of equalizing the coloring matter in one streak or in two adjoining streaks, as may be required, substantially as set forth.

8. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel and an equalizer constructed as a two-armed blade, the arms having substantially vertical inner surfaces, such surfaces where nearest the distributing

wheel being placed at different distances laterally from the outer operative edges of such distributing wheel, substantially as set forth.

9. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel and a blade having arms adjusted to extend along and across both ridges of a streak of coloring matter on the yarn, the lower parts of their inner surfaces being made substantially vertical, for the purpose of draining the coloring matter back into the color box, substantially as set forth.

10. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, two distributing wheels mounted on the same carriage, one behind the other, and an equalizer with sharp edge in contact with the yarn following in the path of said wheels substantially as set forth.

11. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, two distributing wheels mounted on the same carriage one behind the other and having faces of different widths, substantially as set forth.

12. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel constructed to produce two ridges on such yarn, and a second distributing wheel, mounted on the same carriage behind aforesaid wheel and constructed to produce ridges parallel with aforesaid ridges, substantially as set forth.

13. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, two distributing wheels, each provided with an independent spring, substantially as set forth.

14. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, an equalizer for displacing the coloring matter laterally and draining it downward, and a blade or scraper for forcing the coloring matter into the yarn, substantially as set forth.

15. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, an equalizer for displacing the coloring matter laterally and draining it downward, a spring actuating such equalizer and a blade or scraper for forcing the coloring matter into the yarn actuated by an independent spring, substantially as set forth.

16. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel, an equal-

izer held against the yarn by pressure and a device for forcing the coloring matter into the yarn subject to a greater pressure than the pressure imparted to the equalizer, substantially as set forth.

17. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel and an equalizer mounted on or actuated by a leaf spring, as 46, substantially as set forth.

18. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, a distributing wheel, a device for forcing coloring matter into the yarn mounted on a sliding support, a guide for conducting such supports vertically, a rail on which such support rides and means for raising and lowering such support with reference to such rail, substantially as set forth.

19. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel and a device for forcing the coloring matter into the yarn mounted on a sliding support, a guide for conducting such support vertically, means for placing and for maintaining such support in an elevated position and a spring for depressing it, substantially as set forth.

20. In an apparatus for printing carpet yarns, in combination with the drum carrying the yarn, two distributing wheels mounted in different compartments of the color box and means for draining the liquid contents of one of said compartments into the other compartment, substantially as set forth.

21. In an apparatus for printing carpet yarns, in combination with a drum carrying the yarn, a distributing wheel and a blade mounted on a leaf spring hinged for the purpose of permitting the turning upward of such spring and blade, substantially as set forth.

22. In an apparatus for printing carpet yarns in combination with the drum carrying the yarn, a distributing wheel and a device for equalizing the coloring matter on the yarn mounted over the coloring box on a support adjusted to slide vertically a guide along which such support moves and means for moving such device laterally from its position over the color box, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 24th day of June, A. D. 1892.

WILLIAM SHAW.

Witnesses:

LEONARD J. LANGBEIN,
CHAS. L. HORACK.