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O. W. BRANTLEY ET AL

CLEANING MACHINE

Filed March 21, 1925

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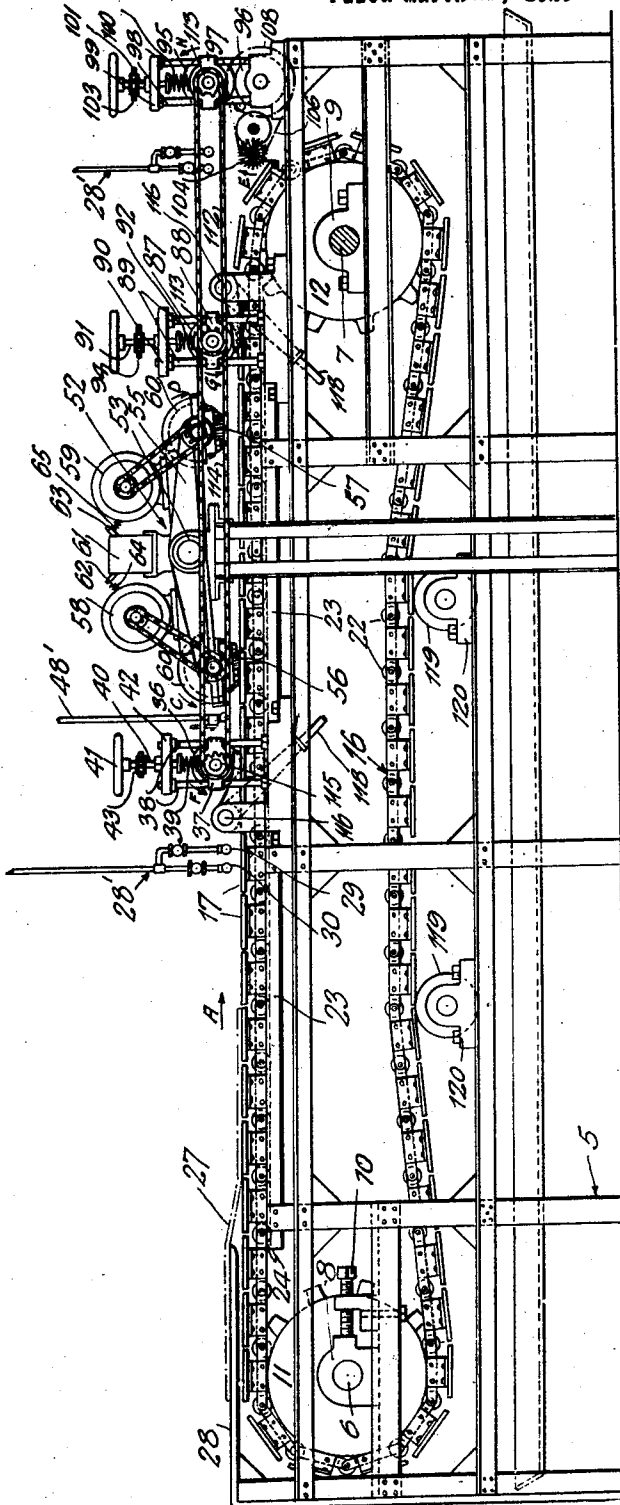


Fig. 1.

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Jan. 3, 1928.

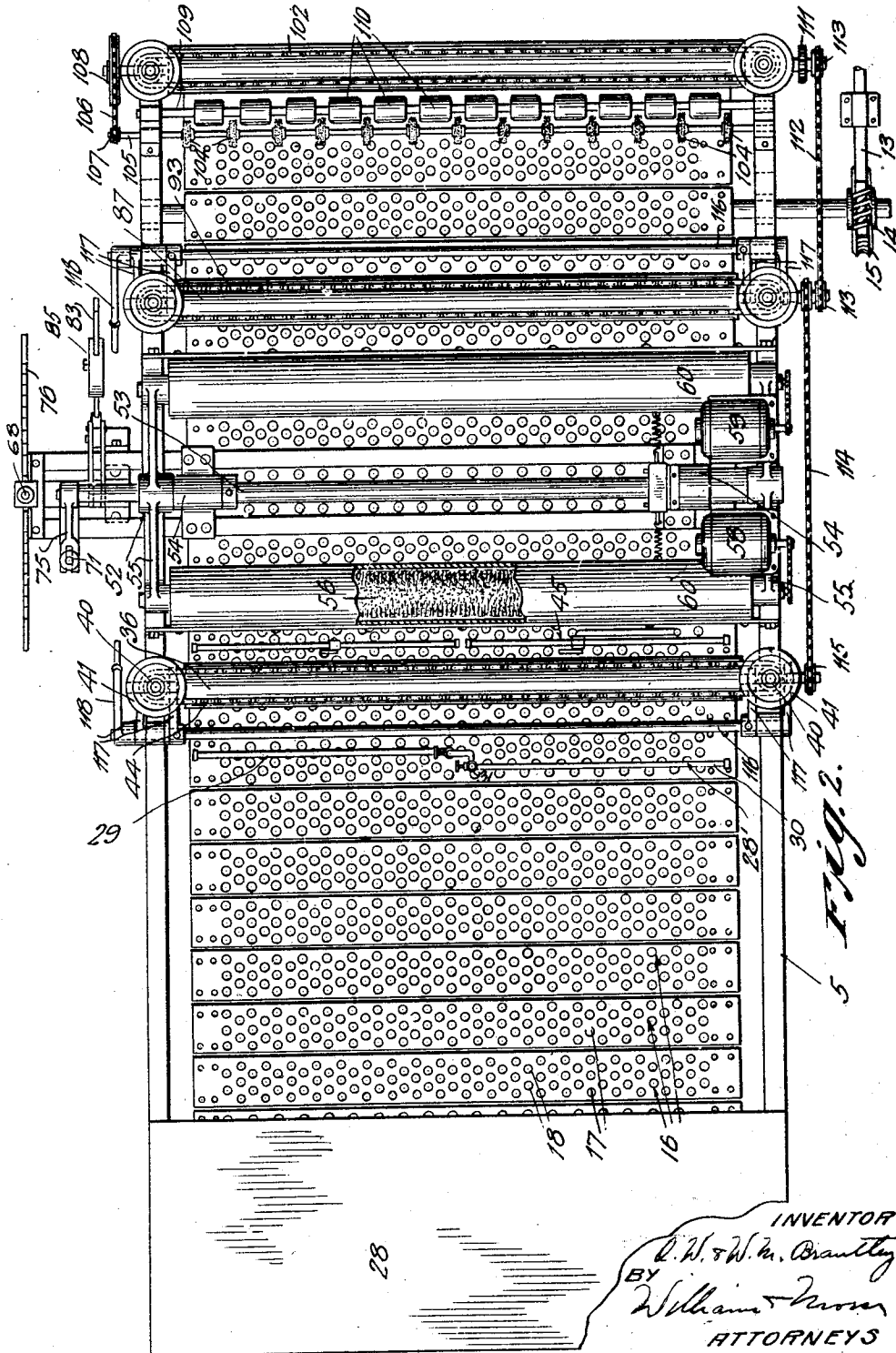
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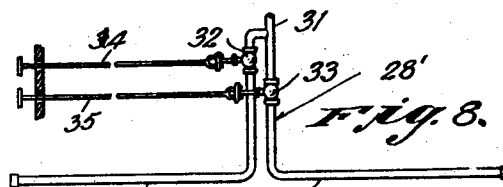
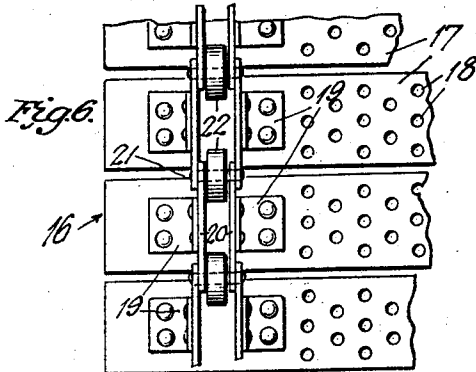
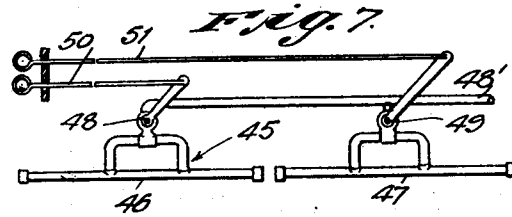
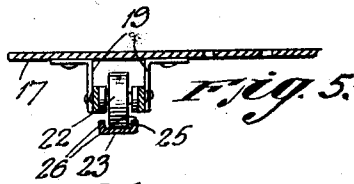
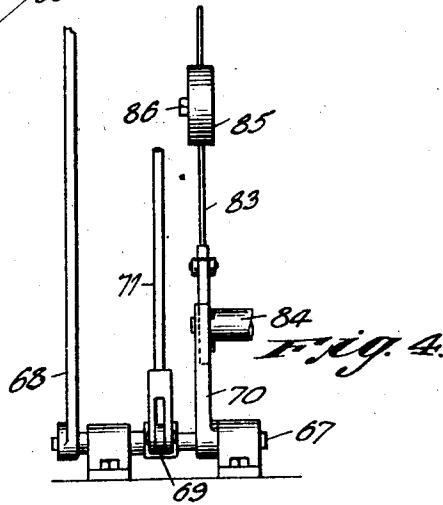
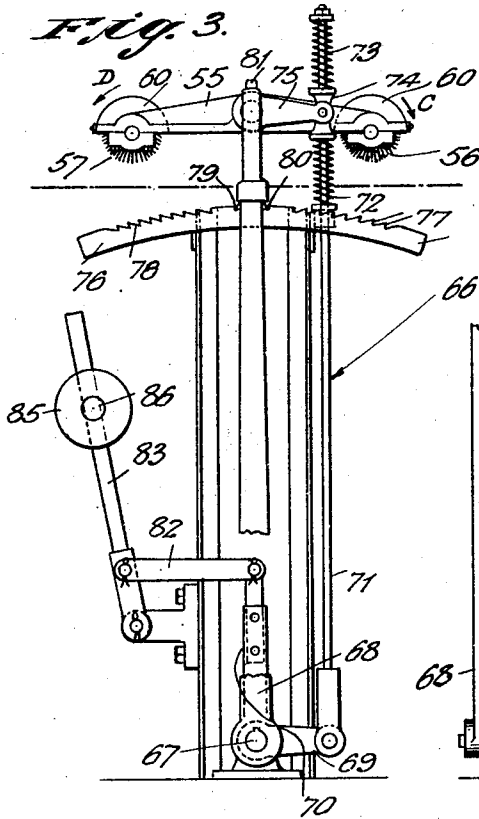
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O. W. BRANTLEY ET AL

CLEANING MACHINE

Filed March 21, 1925

3 Sheets-Sheet 3



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# UNITED STATES PATENT OFFICE.

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## CLEANING MACHINE.

Application filed March 21, 1925. Serial No. 17,168.

This invention relates to cleaning machines particularly adapted to be used in the cleaning of rugs, carpets and the like, although not restricted to such use.

5 An important object of the invention is to provide a generally improved machine of the character mentioned so designed as to function as a means for expeditiously and effectively cleaning the articles subjected to  
10 treatment at the expense of a minimum detrimental effect upon the articles and with the expenditure of minimum manual labor.

Other objects and certain advantages of the invention will become apparent from the  
15 following description when taken in connection with the accompanying drawings in which—

Figure 1 is a side elevation of a machine embodying our invention.

20 Figure 2 is a plan view of the machine.

Figure 3 is a detail view in elevation of a control mechanism.

Figure 4 is a view taken at right angles to the control mechanism as viewed from  
25 the right in Figure 3, certain elements being broken away.

Figure 5 is a detailed sectional view showing a fragmental portion of the conveyor and guide or supporting means therefor.

30 Figure 6 is a fragmental view, in plan, of a portion of the conveyor showing certain link and roller constructions.

Figure 7 is a view, more or less diagrammatic, showing a cleaning fluid supply and  
35 control mechanism.

Figure 8 is a view, similar to that of Figure 7, showing a water supply and control mechanism.

In the drawings wherein for the purpose of illustration is shown what we at present consider the preferred form of our invention, the numeral 5 indicates a suitable frame upon which is mounted a pair of shafts 6 and 7. These shafts are journaled  
45 within adjustable and fixed bearings 8 and 9, respectively, the former of which are adapted to be adjusted longitudinally of the machine by means of conveyor tensioning screws 10. The shafts 6 and 7 are provided  
50 respectively with sprockets 11 and 12 which are adapted to be driven in a clockwise direction, as viewed in Figure 1, through the instrumentality of a suitable motor or

other power plant, not shown, adapted for connection with a drive shaft 13, carrying  
55 a worm 14 meshing with a worm gear 15 which is secured to the shaft 7.

The sprockets 11 and 12 are adapted to carry an endless conveyor 16 which is moved, during the operation of the machine, in the  
60 direction of the arrow A shown in Figure 1 and comprises a plurality of transversely disposed slats 17. These slats are spaced an appreciable distance from each other and are each provided with a plurality of perforations 18, the presence of which facilitates  
65 penetration and drainage of certain liquids to which the articles are subjected in cleaning. To the slats 17 are connected angle irons or brackets 19, carrying links 20 which  
70 are connected together by means of pins 21 upon which are mounted rollers 22. These rollers not only tend to reduce friction between the conveyor 16 and the sprockets 11 and 12 during the operation of the machine,  
75 but they also function similarly in connection with guide rails or supports 23 suitably secured to the frame 5. The guide rails or supports, it will be noted, are disposed in a horizontal plane directly beneath the upper  
80 reach of the conveyor and are turned down at their forward ends, as shown most clearly in Figure 1, to provide inclined lips 24 for facilitating progressive lifting and entering of the rollers 22 into the grooves 25 afforded  
85 intermediate the upstanding flanges 26 of the guide rails. By reason of the fact that the guide rails 23 are so arranged that the rollers 22 travel progressively thereover during the operation of the machine, the upper  
90 faces of the slats 17, carried by the upper reach of the conveyor are at all times maintained in a common horizontal plane during such travel and consequently a uniformly flat surface or support is provided for the  
95 rug or other similar article 27 as it passes through the machine from the feeding table 28 in the direction of the arrow A shown in Figure 1.

More or less remotely to the feeding table  
100 28 is arranged water delivery and control mechanism 28' comprising spray pipes 29 and 30, connected to a common supply pipe 31 which in turn is adapted to be connected  
105 to a suitable source of water supply, not shown. The spray pipes 29 and 30 are

adapted to be controlled independently through the instrumentality of valves 32 and 33, respectively, provided with control rods 34 and 35, each of which is of sufficient length to readily enable an operator stationed at one side of the machine to operate the valves as desired.

In proximity to the spray pipes 29 and 30 there is arranged a compression roller 36 adapted to engage the carpet or other article 27 and exert a sufficient pressure thereupon to squeeze or drive out the greater portion of water previously supplied thereto by the pipes 29 and 30. This compression roller is journaled in vertically movable bearings 37 mounted upon guide rods 38 suitably connected to the frame 5. In order to vary the pressure exerted by the roller 36 upon the carpet or other article 27 we have provided a pair of compression springs, one of which is indicated by the numeral 39. The lower ends of these springs engage the movable bearings 37, whereas the upper ends engage vertically adjustable compression screws 40 provided, at their upper ends, with hand wheels 41 and having screw-threaded connection with yoke plates 42 connected to the guide rods 38. The compression screws 40 are provided with sprockets 43 which are connected together by an endless chain 44. By reason of the operative connection thus afforded between the compression screws 40, simultaneous and uniform adjustments may be made upon the springs 39 from either side of the machine, the springs being placed under greater compression when the hand wheels 41 are turned in one direction and under less compression when the hand wheels are operated in an opposite direction.

Immediately following the compression roller 36 there is arranged a spraying device, indicated by the numeral 45. This device comprises two pipe sections 46 and 47, each of which is connected to a common supply pipe 48' through which a soap solution or other cleansing fluid may be delivered. The delivery of fluid to the pipe sections may be controlled independently by means of valves 48 and 49 arranged intermediate the pipe sections and the supply pipe 48'. To these valves are connected control rods 50 and 51, respectively, each of which is of such a length as to enable its respective valve to be operated by an attendant located at one side of the machine.

Following the spraying device 45 there is located a scrubbing mechanism indicated, as a whole, by the numeral 52. This scrubbing mechanism comprises a transversely disposed shaft 53 suitably journaled to the frame 5 by means of bearings 54. To the shaft 53 is connected a pair of rocker arms 55, to the opposite ends of which are journaled scrubbing brushes 56 and 57 operatively connected to independent motors 58 and 59, re-

spectively, carried by one of the rocker arms and adapted to move bodily therewith. The brushes 56 and 57 are provided with guards or sheaths 60 and are adapted to rotate in the direction of the arrows C and D. Suitably supported with respect to the frame 5 is a stationary starting box 61 provided interiorly with any appropriate type of electrical switch, not shown, from which project, through the walls of the box, a pair of arms 62 and 63. These arms are respectively connected to the brush housings 60 by means of springs 64 and 65.

The operation of the motors 58 and 59, and consequently the operation of the brushes 56 and 57, is controlled by means of a control mechanism indicated by the numeral 66. This control mechanism comprises a rock shaft 67 to which is connected an operating lever 68 and a pair of crank levers 69 and 70, to the former of which is linked an operating rod 71 carrying at its upper end a pair of compression springs 72 and 73 disposed upon opposite sides of an abutment sleeve 74, pivotally connected to an arm 75 carried by the rock shaft 67. Co-operating with the operating lever 68 is a segment or rack 76 provided at opposite ends with groups of notches 77 and 78, between which is formed an intermediate notch 79. Into these notches is adapted to fit a locking dog 80 which may be controlled by means of a release rod 81 carried by the upper end of the operating lever 68 in order to permit the same to be moved from one position to another upon the segment 76. To the lever 70 there is pivotally connected a link 82 which in turn is pivotally connected to an arm 83. This arm is journaled upon a boss 84, carried by the frame 5, and is provided with a weight 85 which is adapted to be adjusted longitudinally of the arm 83 and locked in any desired position thereon by means of a thumb screw 86, the function of the weight being, as it passes vertical dead-center, to facilitate such movement of the lever 68 as will insure one or the other of the brushes being brought into proper relation to the carpet or other article being cleaned.

In an advanced position with respect to the brush 57 there is arranged a second compression roller 87 which is substantially identical with the compression roller 36. The roller 87, like the roller 36, is journaled at opposite ends within vertically movable bearings 88 mounted upon vertically disposed guide rods 89, the upper ends of which are connected together by means of yoke plates 90. To the yoke plates are screw-threaded a pair of adjusting screws 91, the lower ends of which engage compression springs 92 seated upon the bearings 88. These compression springs may be simultaneously compressed or released by reason

of the fact that when one of the screws 91 is turned the other is likewise turned inasmuch as the two shafts are connected together by means of a sprocket chain 93 operating with sprockets 94 carried by the respective shafts.

The pressure roller 87 functions as a means for removing or extruding the major portion of the soap water previously supplied to the carpet prior to the scrubbing action of the brushes 56 and 57, respectively. In order, however, to rinse the article undergoing treatment and thus remove the remaining soap water, we have provided a rinsing device identical with that disclosed in Figure 8, the two spray pipes 29 and 30 being so arranged as to deliver to the carpet or other article being cleansed a sufficient quantity of water to effect thorough rinsing.

In order to remove the rinsing water, applied subsequent to the action of the pressure roller 87, we have provided a pair of squeeze rollers 95 and 96, between which the carpet or other article being cleaned is passed. The roller 95, like the pressure rollers hereinbefore described, is journaled in a pair of vertically adjustable bearings 97 mounted upon upstanding guide rods 98, which are connected together by means of yoke plates 99. In order to urge the roller 95 toward and into engagement, normally, with the stationary roller 96, we employ compression springs 100 identical with those hereinbefore described in connection with the compression rollers 36 and 87, the compression springs 100 being mounted upon the movable bearings 97 and maintained in engagement with the lower ends of adjusting screws 101 which are screw-threaded to the yoke plates 99. These adjusting screws, like the adjusting screws 40 and 91, are connected together by means of a sprocket chain 102 passing over sprockets 103 whereby simultaneous adjustment of the springs 100 may be effected from either side of the machine to vary the pressure exerted by the roller 95.

As a means for freeing the carpet, or other article being cleaned, from the conveyor 16 subsequent to its being acted upon by the compression roller 87 and to further insure delivery of the carpet or other article to the compression rollers 95 and 96, we have provided a plurality of rotary lifting brushes 104 which are carried by a transversely disposed shaft 105 suitably journaled to the frame and operatively connected to the roller 96 by means of a sprocket chain 106 passing over sprockets 107 and 108 connected respectively to the shafts 105 and the roller 96, the connection being such as to rotate the brushes 104 in the direction of the arrow E, shown in Figure 1. Intermediate the lifting brushes 104 and the roller 96 is arranged a transversely disposed shaft 109 carrying a plurality of drums which serve as guides or

supports for the carpet after it has been lifted from the conveyor 16 and while it is being directed into the rollers 95 and 96.

Inasmuch as the compression rollers 36 and 87 bear directly upon the upper span of the conveyor 16 it is necessary to rotate these rollers in the direction of the arrows F and G shown in Figure 1 and at a peripheral speed corresponding to the linear speed of the conveyor, and since the roller 95 is adapted to engage and act upon the carpet in some instances prior to its being released from the roller 87 it is necessary to rotate the roller 95 at a peripheral speed corresponding to the linear speed of the conveyor. The proper speed of rotation of the roller 95 may be obtained by suitably connecting its associated gear 111 by any suitable means such as a train of gears, not shown, to the shaft 13, for example, the connection being such as to cause the roller 95 to rotate in the direction of the arrow H. By the system of gearing herein shown as comprising a sprocket chain 112 and sprockets 113, rotation of the roller 87 in the direction of the arrow G and at a peripheral speed corresponding to the linear speed of the conveyor 16 is insured and so also is rotation of the roller 36 in the direction of the arrow F and at a proper speed insured by reason of the connection herein shown as comprising a sprocket chain 114 and sprockets 115.

In the event a rug is turned or curled up more or less at the end thereof when it is first introduced into the machine difficulty might be experienced in feeding the rug to the roller 36, but in order to overcome such difficulty we have provided means for temporarily lifting the roller 36 to permit the rug to be readily started in its travel thereunder. The means for lifting the roller under such circumstances comprises a transversely disposed rock shaft 116 journaled to the frame 5 and provided at opposite ends with pairs of fingers 117 upon which the bearings, in which the roller 36 is journaled, normally seat. This rock shaft 116 is provided at one end with an operating lever 118 which, when moved in the proper direction, will cause the fingers 117 to simultaneously move the bearings 37 upwardly upon the guides 38 and cause a corresponding elevation of the roller 36. After the curled or upturned end of the rug has passed under the roller 36 the same may be then lowered to its normal position. The upturned end of the rug may be straightened out by the action of the scrubbing brush 56, but if it should fail to become so straightened the roller 87 upon being reached may be elevated by a second lifting means substantially identical with the means hereinbefore described for lifting the roller 36.

Due to the extreme weight of the con-

veyor 16, we have provided means for supporting the lower reach thereof in order to relieve certain parts of the machine of any undue strains to which the same might otherwise be subjected. The supporting means herein shown for supporting the lower span of the conveyor 16 comprises suitable rollers 119 over which the conveyor is adapted to ride, the rollers being journaled in bearings 120 carried by the frame 5.

In operation the rugs are placed upon the table 28 and are fed onto the conveyor 16, traveling in the direction of the arrow A. As the rug passes under the pipes 29 and 30 it is subjected to a spray of water which initially wets the rug so that a subsequent spray of cleansing fluid may readily penetrate the same. The rug in passing on through the machine is subjected to the action of the compression roller 36 and as it emerges from under this roller it is subjected to a spray of cleansing fluid, such as soap water, delivered by the spraying device 45. The rug after having been subjected to the cleansing fluid is subjected to a scrubbing action by the scrubbing brush 56 rotating in the direction of the arrow C shown in Figure 1, and thereafter passes on under the scrubbing brush 57 while the same is maintained in an elevated position as shown in Figure 1. After the rug has started under the pressure roller 87, the control mechanism 66 is so actuated, by moving the control lever 68 into position over one of the notches 78, as to cause the rock shaft 53 to partially rotate within its bearings thus lowering the scrubbing brush 57 into contact with the rug and at the same time lifting the scrubbing brush 56 out of contact therewith. As the brush 56 is lifted and the brush 57 is lowered the tension of the spring 64 is released and the spring 65 is placed under tension, whereupon the arm 63 of a suitable snap switch mechanism, not shown, is so moved as to operate the switch, thereby opening the circuit through the motor 58 and closing the circuit through the motor 59. The remaining or uncleaned portion of carpet or rug is then subjected to the scrubbing action of the brush 57 rotating in the direction of the arrow D, and as the rug continues in its movement through the machine it is progressively subjected to the action of the roller 87 and is thereby relieved of the dirty cleansing fluid. The rug upon reaching the lifting brushes 104 is transferred over the guide rollers 110 to the compression rollers 95 and 96, it being in its transfer from the conveyor 16 to the final compression rollers subjected to a spray of rinsing fluid, such as clear water. The water thus applied dissolves any excess dirty cleansing fluid which may have remained in the rug, and as the rug progresses through the compression rollers 95 and 96 the major por-

tion of cleansing water is squeezed out and the rug emerges in a moist but not dripping condition.

If it is desired to discontinue the operation of the machine, in so far as the motors 56 and 59 are concerned, the operating lever 68 may be moved to its neutral position shown in Figure 3 in which position the motor circuits are maintained open. Upon moving the operating lever 68 to the right, as viewed in Figure 3 preparatory to another operation, identical with that previously described, the tension in the spring 65 is relieved, thus permitting the arm 63 to move up and the arm 62 to move down under the influence of the tension set up within the spring 64 as a result of which movements the circuit through the motor 58 is closed. It will be noted from the construction of the control mechanism 66, details of which are shown in Figures 3 and 4, that when the lever 68 is moved to the right the spring 73 is placed under compression thus forcing the brush 56 into intimate contact with the carpet or rug. If the carpet undergoing treatment happens to be an old one having its nap or pile so worn at intervals as to present hollows, the brush is forced down into such hollows by the spring. After the carpet or rug is so moved as to present its longer or normal length of pile to the scrubbing action of the brush 56 the spring 73 will yield slightly and assume its normal condition. The same operation is also true of the spring 72 when the brush 57 is operating upon the carpet or rug. Thus it will be appreciated that the springs 72 and 73 function as an effective means for maintaining the brushes 57 and 56 respectively in uniformly intimate engagement with the article undergoing treatment.

The machine herein shown is of such proportions as to receive and operate upon relatively wide rugs, in which case both the water pipes 29 and 30 as well as both of the pipe sections 46 and 47 may be employed, but in the event only relatively narrow rugs are to be cleansed and they are to be run through the machine progressively in a single row only half of the available fluid supply need be employed. The control of the water supply and cleansing solution may, therefore, be controlled accordingly as will be readily appreciated from what has been said in connection with the disclosures of the cleansing agent supply and water supply mechanisms shown respectively in Figures 7 and 8.

While we have shown and described what we at present consider the preferred embodiment of our invention, it will become apparent that various modifications may be made in many respects without departing from the spirit of the invention as defined in the claims hereto appended.

We claim:

1. In a cleaning machine, a conveyor adapted to carry articles to be cleaned, rotatable scrubbing brushes located above said conveyor and adapted to act upon the articles supported thereby, means for moving one of said brushes out of contact with the article so supported and for simultaneously moving the other of said brushes into contact with the article so supported, independently operated means for rotating said brushes, and means cooperating with the first named means for stopping the rotation of one of said brushes upon movement of the same out of contact with the article and for starting the operation of the other of said brushes when moving the same into contact with said article.

2. In a cleaning machine, a conveyor adapted to carry articles to be cleaned, scrubbing brushes adapted to act upon the articles carried by said conveyor, means for moving one of said brushes out of contact with the articles and for simultaneously moving the other of said brushes into contact with the article, independently operable electric motors for actuating said brushes independently of each other, and means for closing the circuit through one of said motors upon moving one of said brushes into contact with the article and for opening the circuit through the other of said motors upon movement of the other of said brushes out of contact with the article.

3. In a cleaning machine, a conveyor adapted to carry articles to be cleaned, scrubbing brushes adapted to act upon the articles carried by said conveyor, means for moving said

brushes alternately into and out of contact with the articles to be cleaned, means for supplying a cleansing fluid to the articles prior to their being acted upon by said brushes, means for supplying a cleansing fluid to said articles subsequent to their being acted upon by said brushes, compression rollers to which the articles are delivered subsequent to the application of the second named cleansing fluid, and a rotary brush for facilitating removal of the articles from the conveyor and for facilitating delivery thereof to said compression rollers.

4. In a cleaning machine a conveyor adapted to carry articles to be cleaned, scrubbing brushes located above said conveyor and adapted to act upon the articles supported thereby, means for moving said brushes alternately into and out of contact with the articles so supported, a compression roller under which the articles pass prior to being acted upon by said brushes, a second compression roller under which the articles pass subsequently to being acted upon by said brushes, said rollers being normally in contact with said conveyor, means associated with each of said rollers for lifting the same out of contact with said conveyor, means for supplying a cleaning fluid to the articles prior to their being acted upon by said brushes, and compression means to which said articles are subjected subsequent to their passage under the second named roller.

In testimony whereof, we have affixed our signatures to this specification.

OLIVER WILSON BRANTLEY.  
WARNER MOREL BRANTLEY.