

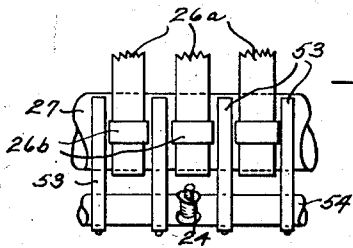
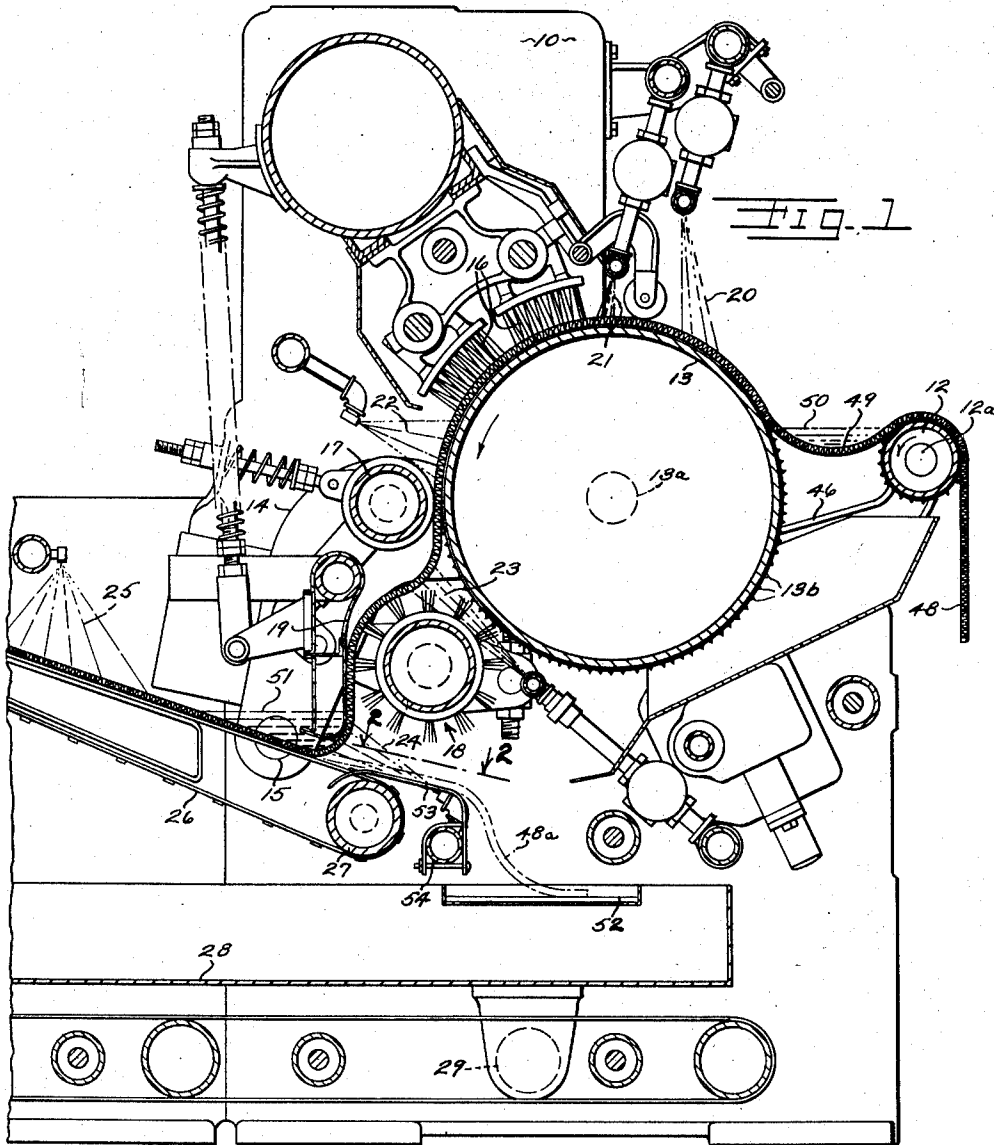
April 2, 1957

C. A. KETCHUM ET AL
RUG CLEANING MACHINE

2,787,153

Filed Sept. 3, 1954

2 Sheets-Sheet 1



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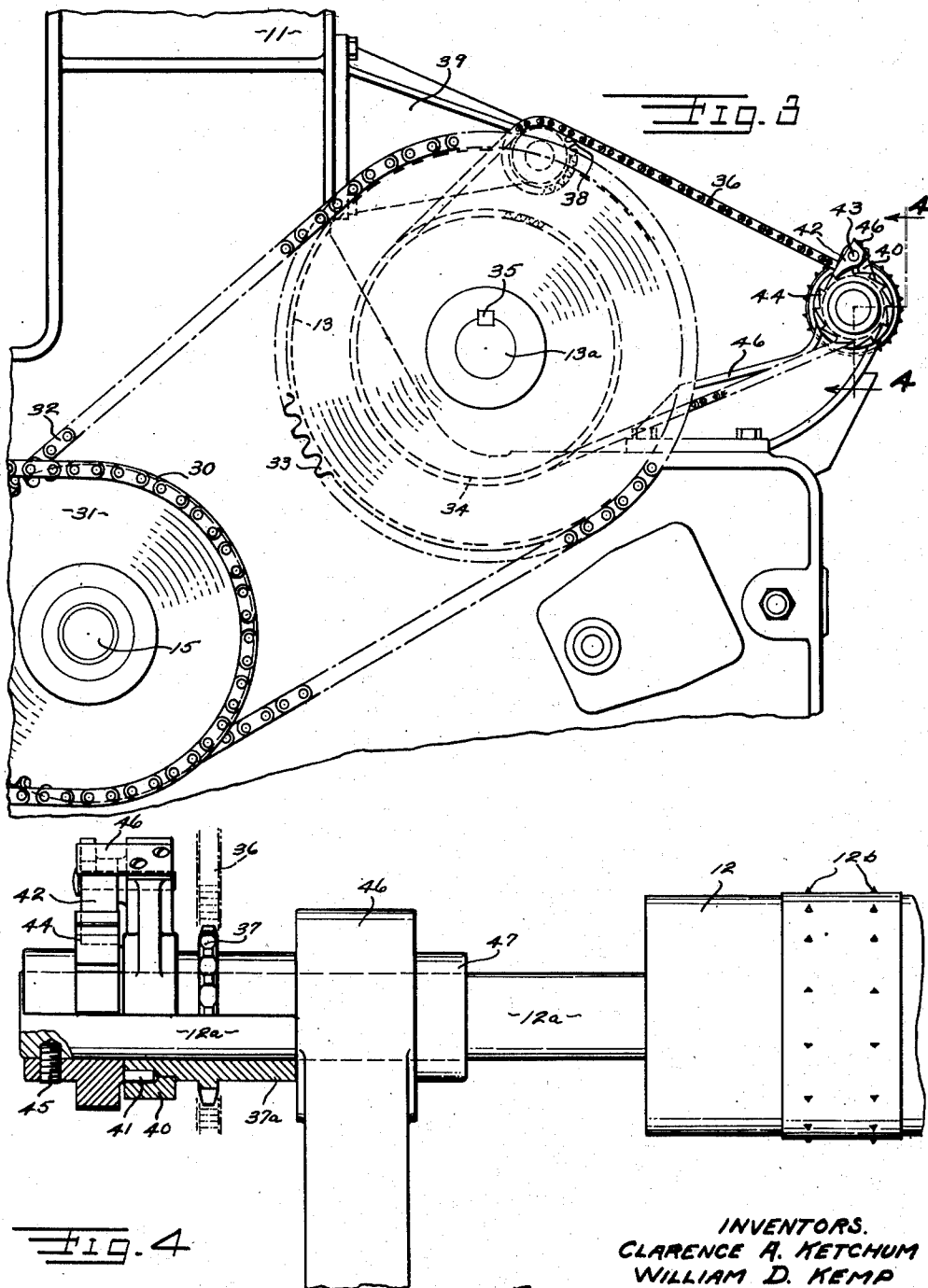
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RUG CLEANING MACHINE

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Application September 3, 1954, Serial No. 454,001

5 Claims. (Cl. 68—205)

This invention relates to improvements in a rug cleaning machine, and more particularly to improvements in the rug feeding arrangement and in the utilization of liquid collected on the upper surface of the rug as it passes through the machine.

One of the objects of the present invention is the provision of a large main, feed roll for the rug and a smaller diameter auxiliary feed roll, both rotatably mounted in a frame with the auxiliary feed roll spaced from the main roll toward the operator and generally parallel to the main roll, together with means for driving both of said rolls whereby the driven feed roll assists the operator in introducing a rug to the machine.

A further object of the present invention is the provision of main and auxiliary feed rolls as mentioned in the preceding paragraph together with means for driving both of said rolls at substantially the same peripheral speed, together with an overrunning clutch connection between the auxiliary roll and its drive means which is free running in the direction of rug advance only, so that an operator may push a rug over the auxiliary feed roll freely to start the rug into the machine.

A further object of the invention is the provision of a machine as defined in the next two preceding paragraphs together with a liquid spray directed onto the top surface of a rug on the feed rolls, with said spray adapted to strike the rug on that side of a vertical plane through the axis of the main feed roll toward the auxiliary feed roll so that a trough may be formed in the rug between the rolls to hold the pre-wetting liquid and after the machine has started, the fact that the two rolls are driven at substantially the same peripheral speed will maintain the trough while the rug passes through the machine.

Still another object of the present invention is the provision of a feed roll rotatably mounted in the frame of the machine with a conveyor having its tail end below and to the rear of the feed roll in position to receive a rug leaving the roll, with the conveyor having its upper run inclined upwardly away from its tail end and away from the roll, together with liquid spray means directed toward the upper surface of a rug passing through the machine and on that side of the feed roll toward the conveyor so that a pool of liquid collects on the rug where it turns to pass up the conveyor, the space to the rear of this point being free of any rug restraining members above the level of the conveyor so that the trailing end of a rug is adapted to fall freely toward the tail end of the conveyor at which time the pool of liquid collected on the upper surface of the rug flows over the trailing end as it falls downwardly so as to smooth out the trailing end.

The invention also includes a rug supporting surface approximately aligned with the rug conveying surface of the conveyor and extending rearwardly of its tail end arranged in such a way that a liquid spray is adapted to engage the back side of a rug on this supporting surface

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so that the trailing end of a rug may have the back surface rinsed clear to the trailing edge thereof.

Other objects and advantages of the present invention will be apparent from the accompanying drawings and description and the essential features will be set forth in the appended claims.

In the drawings,

Fig. 1 is central sectional view through a rug cleaning machine embodying the present improvements;

Fig. 2 is a fragmental sectional view taken from the position of the line 2—2 of Fig. 1;

Fig. 3 is an end elevational view, slightly enlarged, taken from outside of the frame of the machine of Fig. 1 on the side thereof nearer the viewer of Fig. 1; while

Fig. 4 is a fragmental view partly in elevation and partly in section taken along the line 4—4 of Fig. 3.

We have chosen to describe the present improvements as utilized in connection with a rug cleaning machine which is more fully disclosed and claimed in our copending application Serial No. 453,556, filed September 1, 1954, to which reference may be had for further details of the machine. It is sufficient to state here that the frame of the machine includes two parallel end frame members 10 and 11, the end farthest from the viewer being shown in Fig. 1 and the end nearer the viewer being shown in Fig. 3. On this frame are rotatably mounted an auxiliary feed roll 12, a main feed roll 13 and a pair of end supporting arms for the feed roll 13, one of which is indicated at 14 pivotally mounted on the end frame member 16 at 15. As clearly described and shown in the above-mentioned copending application, the opposite ends of the main feed roll 13 are mounted by means of their trunnions 13a in the free ends of the two levers 14 so that the feed roll 13 may be adjusted toward and away from the brushes 16 to accommodate rugs of different thickness. The copending application explains how the drag roll 17, rotatable back washing brush 18 and its backing plate 19 are also mounted on the arms 14 so as to move with it during adjustment. The machine is provided with a pre-wetting spray 20, a top detergent spray 21, a first top rinse spray 22, a back detergent spray 23, a back rinse spray 24, and a final top rinse spray 25. The rug is carried away from the machine by an endless belt conveyor 26 passing around a tail pulley at 27 and having its upper run inclined upwardly and rearwardly to carry the rug out of the machine. All of the liquid drains into a pan 28 which has a drain connection 29.

The present invention provides means for positively driving an auxiliary feed roll 12. To this end, a drive chain 30 driven by the main motor (not shown) of the machine drives an idler sprocket 31 which is a compound sprocket and drives chain 32. This chain, in turn, drives a sprocket 33 which is rotatable with the feed roll 13. The sprocket 33 is part of a compound sprocket which also includes a sprocket 34, this sprocket being connected to the trunnion 13a of the feed roll 13 by means of a drive key 35. Drive chain 36 drivably connects sprocket 34 and another sprocket 37 which has a hub 37a rotatable on the shaft 12. The chain 36 passes over an idler sprocket 38 and is rotatably mounted on a bracket 39 which is fixed to the frame member 11. The choice of the sprockets 33, 34 and 37 is such that the peripheral speed of rollers 12 and 13 is substantially equal so that a rug travels at the same linear speed around the periphery of each of these feed rolls.

It will be noted that the idler sprocket 31 is rotatably mounted on the stub shaft 15 which pivotally supports the lever arm 14 previously mentioned. Thus, arcuate movement of the main feed roll 13, when adjusted for rugs of varying thickness, does not disturb the driving relation between the sprockets 33 and 31. However, the idler

sprocket 31 might be otherwise located and spring pressed slack take-up idler used along the run of chain 32.

An over-running clutch connection is provided between shaft 12a of auxiliary feed roller 12 and its driving sprocket 37, this clutch connection being free running in the direction of rug advance only. For this purpose the hub 37a of sprocket 37 is drivingly connected to a drive member 40 by means of a pin key 41. A pawl 42 is pivotally connected to this drive member on the pivot 43. This pawl cooperates with a ratchet 44, the hub of which is secured to shaft 12a by set screws 45. A flat spring 46 on the drive member 40 rests upon the flattened top of the pawl 42 and resiliently holds the latter in driving engagement with the teeth of ratchet 44. The roll 12 has its shaft 12a journaled in frame brackets 46 and held in position by two collars 47 positioned, one adjacent each of the frame members 46. It will be thus apparent that the roll 12 normally is driven in the direction of the arrow of Fig. 1 by the pawl and ratchet rotating in unison, nevertheless, the roll 12 may be rotated by an exterior force faster than the driving pawl and in the direction of the arrow of Fig. 1, as when an operator pushes on the rug 48 in the direction of rug movement through the machine, in which case the sloping teeth of the ratchet 44 are over-running the pawl 42. This makes it much easier to introduce the rug to the machine because the weight may be placed upon the roller 12 without danger of the rug rolling back off the roller 12 down against the operator, after which the rug may be pushed forwardly into the machine until it is caught by the tines on the feed roll 13. These tines 13b on the main feed roll and 12b on the auxiliary feed roll provide a substantially non-slipping engagement between the feed rolls and the rug.

The arrangement described in the preceding paragraph makes it easier for the operator to form a trough 49 in the rug 48 between the feed rollers 12 and 13. To do this, it is unnecessary to lift the rug off the auxiliary feed roll 12 which would be a heavy and difficult operation. Instead, with the rug started across the two rolls, 12 and 13, the operator needs only to push forward on the rug, without lifting, and since the rug is conveyed at a normally slow rate through the machine, the additional push of the operator will rotate the roll 12 in the direction of the arrow of Fig. 1 to form the trough 49. After this, because of the identical peripheral speed of the two rolls 12 and 13, the trough 49 is maintained. Because the liquid spray 20, and to some degree the detergent spray 21, is directed onto the top surface of a rug on that side of a vertical plane through the axis of the main feed roll 13 toward the auxiliary feed roll, liquid will travel down the rug on the forward face of the roll 13 into the trough 49 and form a pool 50 which aids in pre-wetting the rug as it starts into the machine.

As will be apparent from a study of the above-mentioned copending application, when the trailing edge of the rug 48 passes the drag roll 17, it is no longer restrained, and the back scrubbing brush 18, revolving rapidly counter-clockwise as viewed in Fig. 1, moves this end section of the rug downward faster than the rug is being conveyed. This would tend to throw the end portion of the rug down into a wrinkled pile. However, where the rug starts up the conveyor 26, a trough is formed which collects a pool of liquid 51 both from the spray 25 and the spray 22. Since there is no rug supporting means substantially above the level of the conveyor and toward its tail end from the zone where the rug turns up the conveyor, for a sufficient distance to allow the trailing edge of the rug to fall freely toward the tail end of the conveyor, the rug is free to have its trailing end moved toward the dot-dash position indicated at 48a in Fig. 1. When the trailing end section of the rug moves from the full line position of Fig. 1 to the dot-dash line position, the pool 51 flows back over the trailing section as the latter falls, and by its weight and flow rolls the rug end smoothly back to the position indicated in dot-dash lines. An open work grille 52 fixed above the

drain reservoir 28 prevents the trailing end of the rug from hanging in the waste water in the drain pan.

As the rug continues its travel up the conveyor from the dot-dash position of Fig. 1, the under side continues to be effectively rinsed by the spray 24 all the way to the trailing edge thereof. This is possible because the upper run of the conveyor 26 is formed of a plurality of spaced parallel ribbons 26a, preferably having driving cleats 26b attached to their rug engaging surfaces. Where the ribbons pass around the tail pulley 27 preferably there are a plurality of fingers 53 which are clamped to the pipe 54 and have their upper surfaces approximately aligned with the rug-conveying surface of the conveyor and form a rug supporting surface extending rearwardly from the tail end of the conveyor. One or more of the sprays 24 are in communication with the pipe 54 and are located between the fingers 53 and clear of the ribbons 26a so that the under side of the rug may continue to be sprayed.

What we claim is:

1. In a rug cleaning machine or the like, a frame, a feed roll rotatably mounted in said frame, a conveyor having its tail end below and to the rear of said feed roll in position to receive a rug leaving said roll, said conveyor inclined upwardly away from its tail end and away from said roll, liquid spray means directed toward the upper surface of a rug passing through the machine and on the side of the feed roll toward said conveyor whereby a pool of liquid collects on the rug where it turns to pass up said conveyor, and said machine being free of rug supporting means, substantially above the level of said conveyor and toward its tail end from the zone above where said rug turns up said conveyor, for a sufficient distance to allow the trailing end of a rug to fall freely toward the tail end of said conveyor, whereby said pool of liquid flows over said trailing end of a rug as it falls to smooth out said trailing end, and a rug supporting surface approximately aligned with the rug-conveying surface of said conveyor and extending rearwardly of its tail end.

2. The combination of claim 1 wherein said rug supporting surface comprises a plurality of fingers spaced apart, and spray means directed in said spaces between said fingers against the under side of a rug lying on said fingers.

3. In a rug cleaning machine or the like, a frame, main and auxiliary feed rolls rotatably mounted in said frame on horizontal axes, the axis of said auxiliary roll being above the axis and below the top of said main roll, said auxiliary feed roll spaced from and in front of said main roll and generally parallel thereto, said auxiliary roll providing the forwardmost part of the machine toward the operator, means operative at all times for driving said rolls at substantially the same peripheral speed in rug advancing direction, and an over-running clutch connection between said auxiliary roll and its drive means free running in the direction of rug advance only, whereby when the rug is engaged on the upper sides of both rolls, the operator may push the rug freely over said auxiliary roll to form a trough in the rug between said rolls and thereafter said trough will be maintained by said driving means.

4. The combination of claim 3 including a liquid spray directed onto the top surface of a rug on said feed rolls, and said spray positioned to strike said rug on that side of a vertical plane through the axis of said main feed roll toward said auxiliary feed roll, whereby said trough may be filled with liquid.

5. In a rug cleaning machine or the like, a frame, main and auxiliary feed rolls rotatably mounted in said frame on horizontal axes, the axis of said auxiliary roll being above the axis and below the top of said main roll, said auxiliary feed roll spaced from and in front of said main roll and generally parallel thereto, said auxiliary roll providing the forwardmost part of the machine toward the operator, means providing a substantially non-slipping drive between the surfaces of said feed rolls and a rug

carried thereby, means operative at all times for driving said rolls at substantially the same peripheral speed in rug advancing direction, and an over-running clutch connection between said auxiliary roll and its drive means free running in the direction of rug advance only, whereby when a rug is engaged on the upper sides of both rolls, the operator may push the rug freely over said auxiliary roll to form a trough in the rug between said rolls and thereafter said trough will be maintained by said driving means.

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