

Feb. 14, 1950

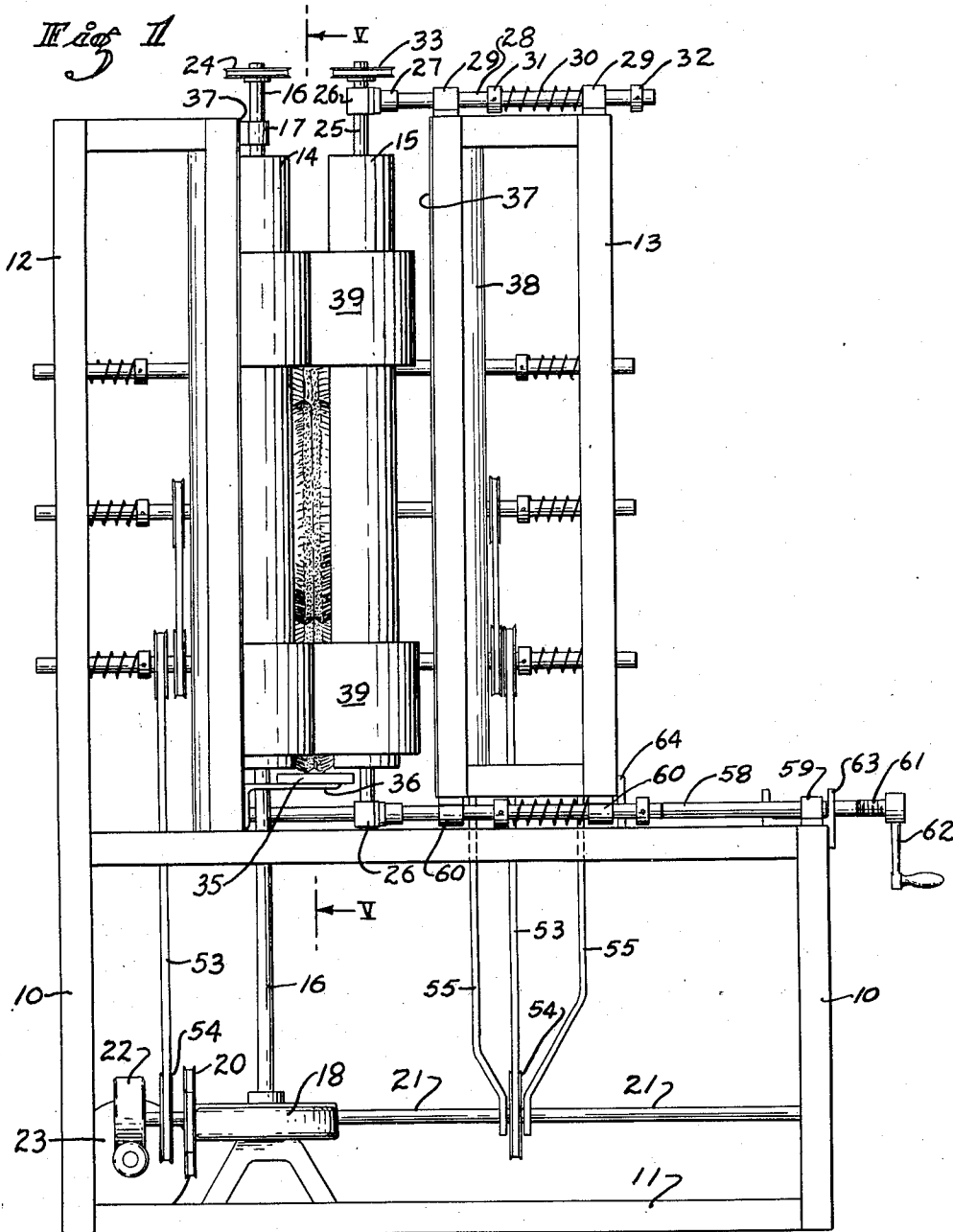
J. A. SPANIER ET AL

2,497,423

APPARATUS FOR SCRUBBING BUNKS AND THE LIKE

Filed Nov. 3, 1944

4 Sheets-Sheet 1



INVENTORS
JOSEPH A. SPANIER
& NORMAN N. SPANIER
BY
Eastberg & Roemer
ATTORNEYS

Feb. 14, 1950

J. A. SPANIER ET AL

2,497,423

APPARATUS FOR SCRUBBING BUNKS AND THE LIKE

Filed Nov. 3, 1944

4 Sheets-Sheet 2

Fig 2

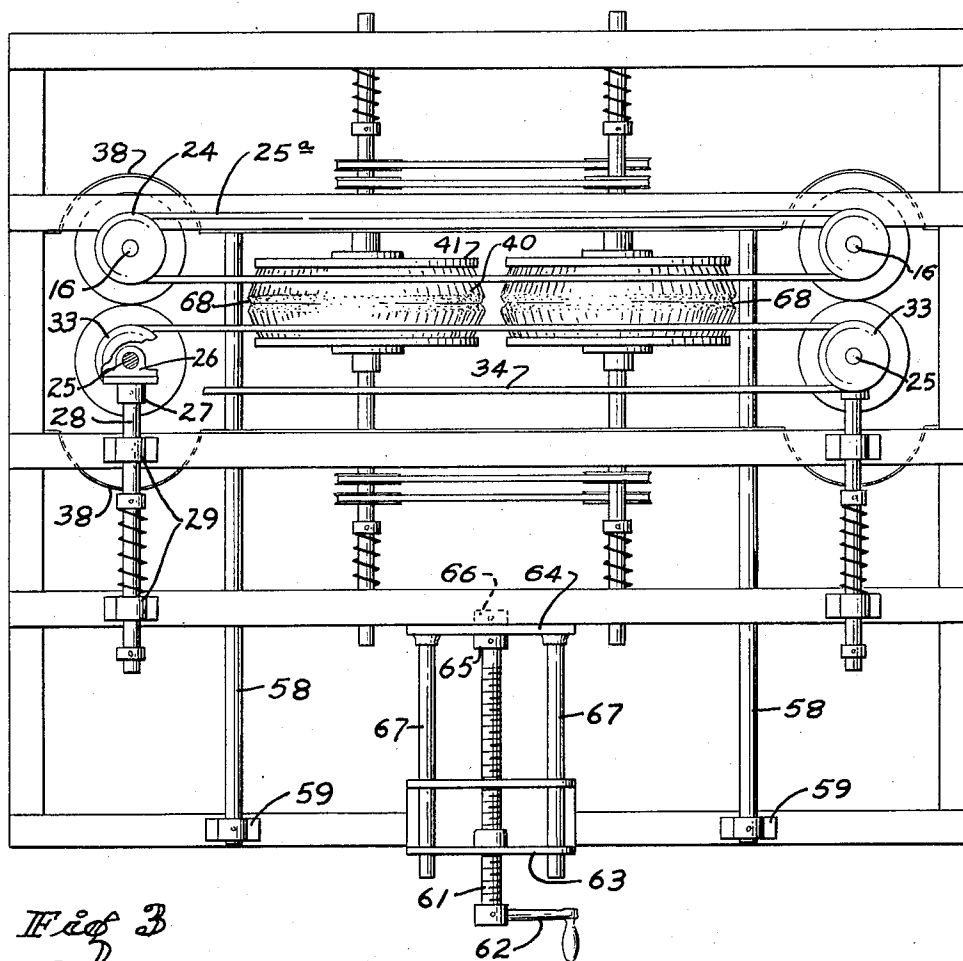
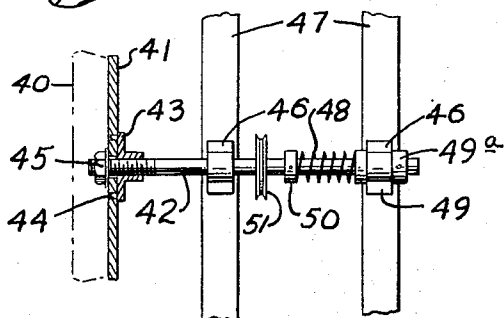


Fig 3



INVENTORS
JOSEPH A. SPANIER
& NORMAN N. SPANIER
BY
Eastberg & Roemer
ATTORNEYS

Feb. 14, 1950

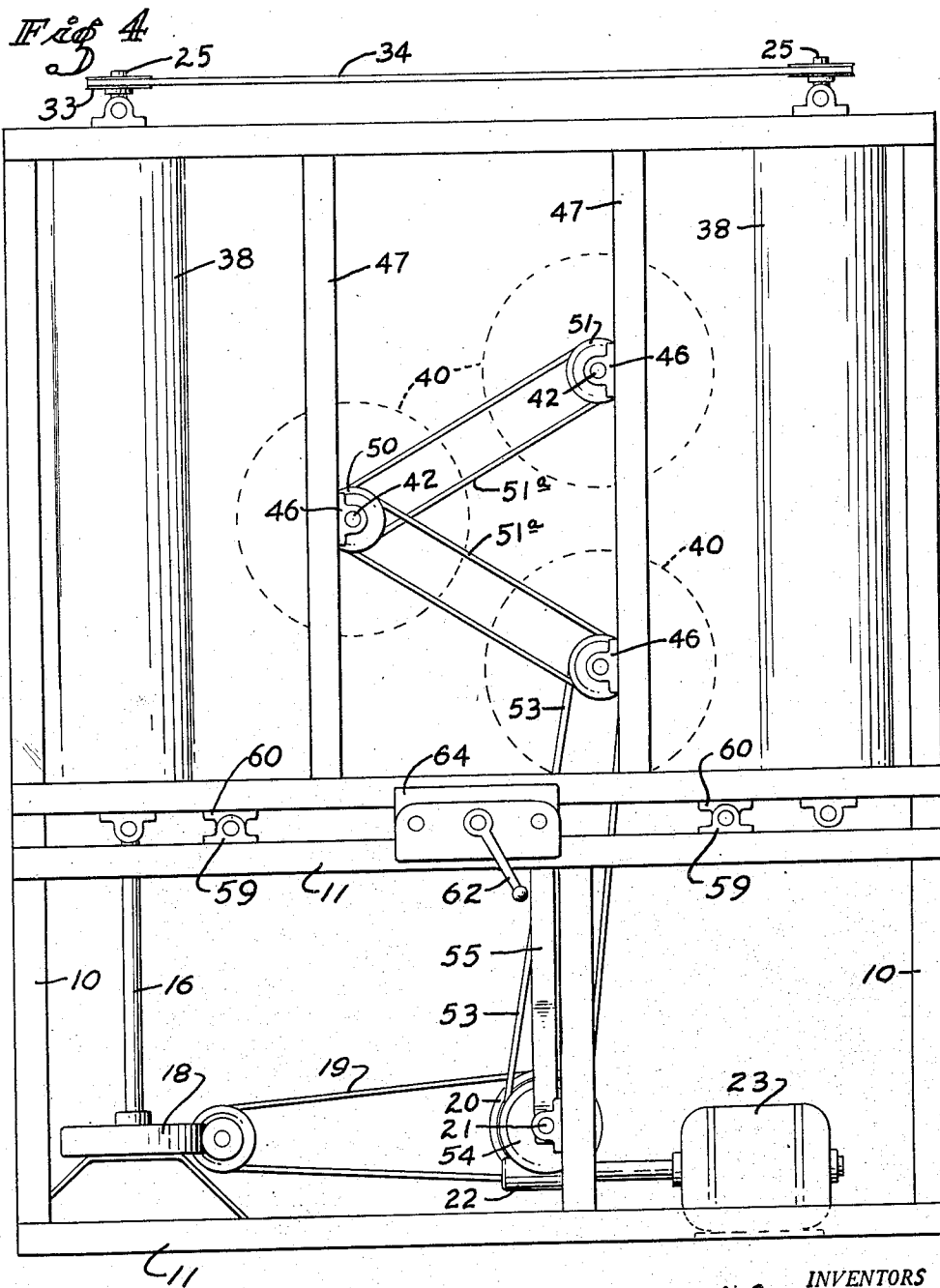
J. A. SPANIER ET AL

2,497,423

APPARATUS FOR SCRUBBING BUNKS AND THE LIKE

Filed Nov. 3, 1944

4 Sheets-Sheet 3



INVENTORS
JOSEPH A. SPANIER
& NORMAN N. SPANIER
BY
Castberg & Roemer
ATTORNEYS

Feb. 14, 1950

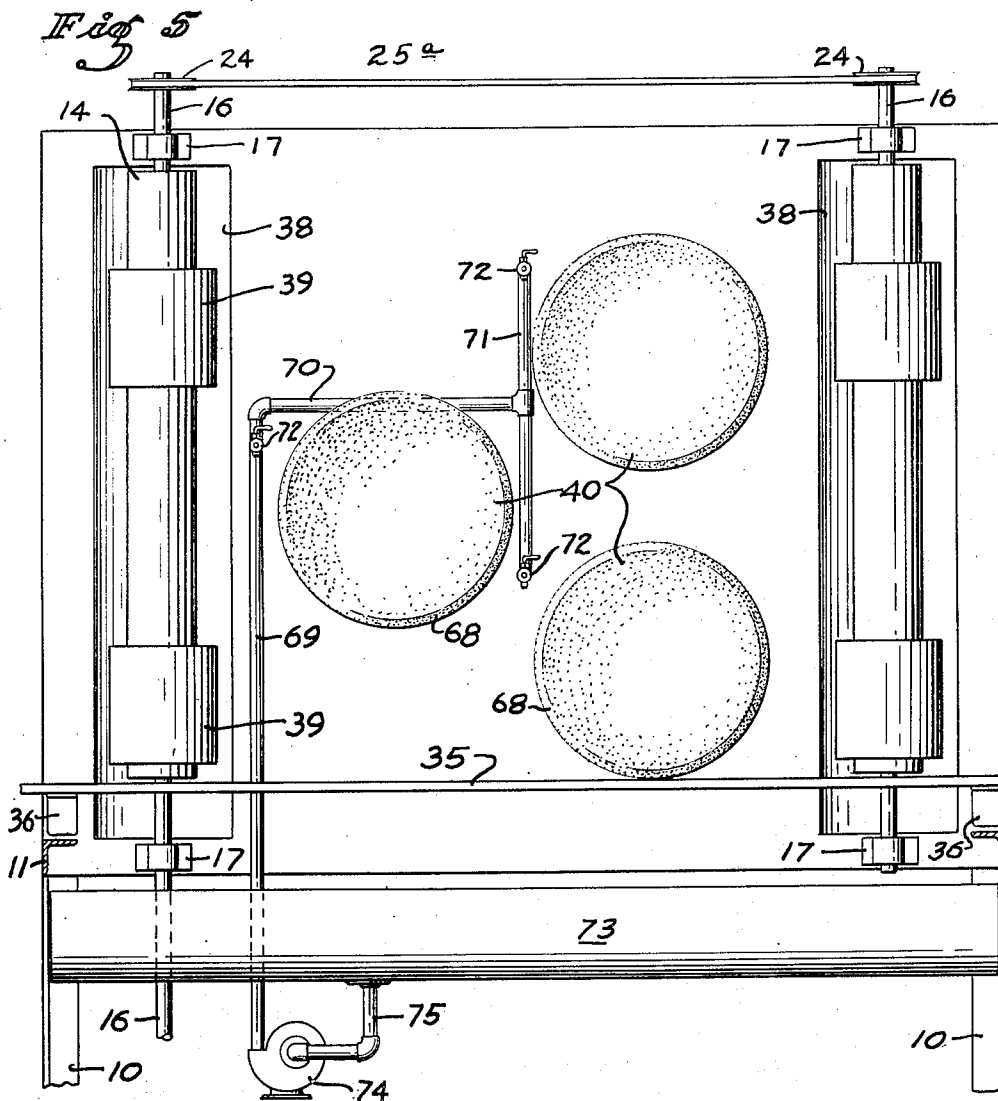
J. A. SPANIER ET AL

2,497,423

APPARATUS FOR SCRUBBING BUNKS AND THE LIKE

Filed Nov. 3, 1944

4 Sheets-Sheet 4



INVENTORS
JOSEPH A. SPANIER
& NORMAN N. SPANIER
BY
Castberg & Roemer
ATTORNEYS

UNITED STATES PATENT OFFICE

2,497,423

APPARATUS FOR SCRUBBING BUNKS
AND THE LIKEJoseph A. Spanier and Norman N. Spanier,
San Francisco, Calif.

Application November 3, 1944, Serial No. 561,750

1 Claim. (Cl. 15—77)

1

The present invention relates to apparatus for scrubbing bunks. The term "bunks" is generally employed as descriptive of a framelike structure used as a sleeping place or bed. On board ships it is customary to employ rectangular metal frames which are attached to bulkheads to project in a horizontal plane. A sheet of heavy canvas is laced to the frame to form a strong but somewhat resilient web for supporting a mattress upon which a bed is made.

At intervals these bunks, as well as the mattresses used upon them, are removed from their fastenings and taken ashore for sterilization and cleaning. One method of cleaning bunks or bunk bottoms as they are sometimes termed is to remove the cord-like lacing by means of which the canvas is secured to the rectangular frame, wash the canvas in an ordinary washing machine, and re-lace it to the frame. This method includes unnecessary and time consuming steps and it has been found that even better cleaning can be effected by thorough scrubbing of the canvas with soapy water and a brush while it remains stretched in the frame. Even the latter method is costly as it requires considerable time and handling of the bunks. In many cases large numbers of bunks must be washed in a limited period of time to be re-shipped before the sailing date of the ship from which they were removed so it is desirable to accomplish the scrubbing of the bunks as rapidly and efficiently as possible.

It is, therefore, the object of the present invention to provide an apparatus for scrubbing bunks which is relatively simple in construction and operation and which is capable of performing an efficient and thorough cleaning job in a minimum of time and with a minimum expenditure of manual labor. It is also the object of the invention to provide an apparatus for scrubbing bunks which through simple adjustments can be employed for scrubbing articles of different dimensions such as the mattresses used on the bunks.

Further objects and advantages of the invention are made apparent in the following specification wherein a preferred embodiment of the invention is described in detail by reference to the accompanying drawings.

In the drawings:

Fig. 1 is a front elevation of an apparatus embodying the present invention;

Fig. 2 is a plan view of the apparatus;

Fig. 3 is a fragmentary view illustrating details of construction of a brush mounting mechanism;

Fig. 4 is an elevation of the apparatus viewed from the right hand side of Fig. 1; and

2

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

The apparatus as shown in the drawings is principally supported on a main frame which is rectangular and horizontally disposed and which comprises vertical frame members 10 and horizontal frame members 11. Other intermediate and angular bracing members may be employed for making the frame rigid, but are omitted in this disclosure for the purpose of simplification. The vertical and horizontal members disclosed may be of angular cross-section or may be made of other suitable structural shapes. A vertical frame work 12 extends upwardly along one side of the main supporting frame and is rigidly attached thereto, and a similar but adjustable frame 13 extends upwardly adjacent the opposite side and is supported by means presently to be described which permit of its being moved to and away from the frame 12. Each of the frames 12 and 13 supports a set of rotatable scrubbing brushes which are mounted on horizontal shafts, the brushes in each set being opposed to each other so that they will, upon being rotated, simultaneously scrub opposite sides of an article passed between them. Each of the frames 12 and 13 also supports a pair of feed rollers which are adapted to cooperate in engaging and advancing the bunks or similar articles to be scrubbed between the opposed faces of the scrubbing brushes. The construction and operation of the rollers is best shown in Figures 1, 2 and 5 wherein vertically disposed rollers 14 are shown as mounted on the frame 12 and similar rollers 15 are shown as mounted on the frame 13. The rollers 14 on the stationary frame are provided with axially disposed shafts 16 journaled in bearings 17 secured to the inner face of the frame 12 and one of this pair of rollers as best shown in Figs. 1 and 5 has its shaft 16 extended downwardly for connection with the gear box 18 (see also Fig. 4) containing reduction gearing which is driven through a belt 19 from a pulley 20 on a shaft 21. The shaft is continuously rotated through a primary reduction gearing 22 driven by any suitable source of power such for example as the motor illustrated at 23. Through the mechanism just described, continuous rotation is imparted to one of the rollers 14 and similar rotation is transmitted to the other roller 14 by means of pulleys 24 and a belt 25 arranged at the upper end of the shafts 16. The rollers 15 which are mounted on the adjustable frame 13 are resiliently urged toward or into contact with the rollers 14. They are also provided with axial shafts 25 similar to the shafts 16 on the rollers

3

14 and these shafts are journaled in bearings 26 which instead of being mounted directly on the frame 14 are mounted as shown in Figs. 1 and 2 on fittings 27 carried by rods 28, each of which rods is reciprocally mounted in a pair of bearings 29 which are carried by the top and bottom of the frame 13 for the top and bottom bearings 26 respectively. Each of the rods 28 is embraced by an expansible spring 30 positioned between one of the bearings 29 and a collar 31 fixed to the rod so as to urge the rod and the roller 15 which it supports toward the opposed roller 14. A stop collar 32 may also be secured to the rod 28 to limit the expansion of the spring 30. The rollers 15 are driven through their contact with the opposed rollers 14 and through the contact with the opposite sides of any bunk or other article which is being passed between the rollers. They are also, however, preferably connected by pulleys 33 and a belt 34 arranged at their upper ends which tends to insure continuous rotation of all of the rollers even though there may occur some slippage between one of the rollers 14 and the opposed roller 15 which is otherwise driven thereby through friction only.

A platform 35 is disposed immediately beneath the rollers and supported on brackets 36 which are secured to the frame 12 and serves as a support for the articles being advanced by the rollers between the scrubbing surfaces of the brushes. Splash guards in the form of sheet metal plates 37 are preferably placed on the faces of the frames 12 and 13 immediately behind the rollers and these splash guards are indented or curved away from the rollers as indicated at 38 to provide clearance. It is, of course, to be understood that all other exposed surfaces of the apparatus may be covered by or enclosed with sheet metal or other protecting material wherever it is desirable to prevent splashing of the washing solution which is applied to the articles being washed by the action of the rotary brushes.

The rollers are shown in the present instance with enlarged portions 39 adjacent their upper and lower ends and these enlarged portions are provided for the engagement of the opposite side frame members of a bunk bottom which is being fed between them. By reason of the fact that bunks are constructed as previously described of a rectangular metal frame usually of tubular material such as pipe of about an inch and a quarter in diameter, it is found that enlarged resilient portions of rubber or a similar material on the rollers spaced to engage the opposite side frame members of the bunk is a most satisfactory arrangement for effecting feeding of the bunks without slippage and at the same time presenting the canvas web to be scrubbed in a satisfactory manner between the effective surfaces of the opposed brushes. The enlarged resilient portions 39 may, however, be omitted from the rollers when the apparatus is employed in scrubbing mattresses or similar articles and the main body of the rollers themselves may be formed of wood, metal or other relatively non-resilient material.

The brushes which perform the actual scrubbing operation are shown at 40 and the number and arrangement of the brushes may be varied, there being three shown in the accompanying drawings arranged in a triangular pattern. Each brush is circular and presents a substantially flat bristle surface, the bristles being mounted on a disc-like backing member 41 which, as most clearly illustrated in Fig. 3, is connected to the

4

end of a shaft 42 by means of a flanged fitting 43 threaded to the shaft and having pins 44 which project into holes in the backing members 41 to prevent relative rotation between the brush and the shaft. A nut 45 is threaded to the end of the shaft and clamps the backing member against the flanged fitting 43. This nut and the end of the shaft to which it is secured are relatively shallow as compared to the depth of the bristles which are indicated in broken lines in Fig. 3 so that they are concealed by the bristles which protrude from the backing member 41. The shaft 42 is journaled in bearings 46 secured to upright members 47 (see also Fig. 4) and these upright members form braces in the frames 12 and 13. Each of the shafts 46 is provided with an expansible spring 48 which bears against an anti-friction thrust bearing 49 at one end which in turn rests against the bearing 46 and bears against a collar 50 at its other end, which collar is secured to the shaft. The spring 48 tends to urge the brush forward or in a direction toward the brush which opposes it so that each of the several brushes is independently urged toward its opposing brush at all times. A stop collar 49a limits the forward movement of each brush. If desired, the stop collar 49a may be threaded to the shaft 42 for adjustment longitudinally thereof so that as the brushes wear away, compensation may be made by permitting the shaft to move a greater distance under influence of the springs 48. The brushes on both of the frames 12 and 13 are all continuously driven as shown in Fig. 4 through pulleys 51 mounted on their shafts 42 and connected by belts 51a, the lowermost of the brushes being driven through a belt 53 operating from a pulley 54 on the shaft 21 which as hereinbefore described is continuously driven by the motor 23. The drive mechanism for the brushes on the frame 12 is stationary or permanently aligned, but as the frame 13 is adjustable to and away from the frame 12, this drive mechanism must be sufficiently flexible to accommodate such adjustment. This flexibility is accomplished by splining the pulley 54 to the shaft 21 for sliding movement thereon while it is driven thereby and, as illustrated in Fig. 1, this pulley 54 is positioned between guides 55 which depend from the adjustable frame 13 so that when the frame is moved to and away from the frame 12, these guides compel the pulley 54 to slide along the shaft 21. This maintains operating alignment of the pulley with respect to the brush driving mechanism on the adjustable frame.

The means for adjusting the frame 13 are best illustrated in Figs. 1, 2 and 4 wherein the frame is shown as supported on rods 58 which extend across the top of the main frame 10 and are secured thereto at both ends by means of brackets such as indicated at 59. Bearings 60 fixed to the bottom of the frame 13 embrace the rods 58 to slide longitudinally thereon and a jack screw 61 with a crank handle 62 thereon is employed for imparting movement to the frame 13 longitudinally of the rods 58. This jack screw is shown in Fig. 2 as being threaded through a plate 63 fixed to the main frame 10 and extending through a plate 64 secured to the adjustable frame 13. The connection between the jack screw and the plate 64 is accomplished with a pair of collars 65 and 66 disposed on opposite sides of the plate 64 to permit rotation of the jack screw but to prevent endwise movement thereof so that upon turning of the screw through

5

the medium of the crank 62, the entire frame 13 is advanced or retracted as the jack screw feeds through its threaded connection on the plate 63. Additional guide rods such as indicated at 67 may be secured to the plate 64 and guided for sliding movement through the plate 63 to prevent twisting of the frame as it is adjusted.

The brushes are all beveled at their edges as indicated at 68 so that when they are brought together in the position illustrated in Fig. 2, opposed brushes present a V-shaped notch by means of which the leading edge of an article to be washed may readily find its way to its position between the brushes. This facilitates feeding articles through the apparatus and also prolongs the life of the brushes materially as the edge of the article to be washed upon entering the V-shaped notch tends more readily to spread the brushes apart against the resiliency of their springs 48. The scrubbing action of the brushes is facilitated by a washing solution such as soap and water or other liquid detergent which is preferably applied to the surfaces of the article being cleaned as it advances toward the brushes.

A preferred arrangement for applying the liquid detergent is illustrated in Fig. 5 wherein a pipe 69 with branches 70 and 71 is shown as having nozzles 72 arranged one in advance of each of the brushes for directing a supply of liquid against the surfaces of the article being washed. The supply of liquid may be contained in a receptacle 73 disposed below the brushes and adapted to receive all excess liquid which drips downwardly therefrom and a pump 74 may be employed to withdraw the liquid through an outlet pipe 75 and direct it through the pipe 69 so that a continuous circulation of cleaning liquid is maintained with the necessity of replenishing the supply only occasionally. The connection between the pump 74 and the pipe 69 is here shown as a solid connection but a flexible connection may be substituted for an identical arrangement carried by the adjustable frame 13 so that the cleaning liquid may be directed simultaneously against opposite sides of the article being scrubbed.

After the article to be washed has passed between the brushes, excess soap may be removed

6

with a squeegee and it may then be rinsed with clean water sprays and subjected to another squeegee before drying. The squeegee and rinsing apparatus is not a part of the present invention, however, and is therefore not disclosed in detail.

As mattresses which are considerably thicker than bunk bottoms are washed in the same manner, they may be passed through the machine by first retracting the adjustable frame with the jack screw 61 until the space between the brushes is adequate to accommodate the thicker object.

Belts have been illustrated throughout the machine as drive means. It is to be understood, however, that chains and sprockets may be substituted for belts and pulleys wherever desired and that various other modifications in construction and arrangement of the several parts shown may be made without departing from the scope of the appended claim.

We claim:

A device for scrubbing bunks or the like comprising opposed scrubbing brushes and pairs of opposed frictionally engaged rollers for advancing bunks to be scrubbed between said brushes, one of said rollers being rotated by power means, a driving connection between said one of said rollers and a roller of another pair, and a driving connection between the rollers which frictionally engage the last mentioned driven rollers to minimize the tendency toward slippage at the points of frictional driving contact.

JOSEPH A. SPANIER.
NORMAN N. SPANIER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,497,921	Levedahl	June 17, 1924
1,652,834	Neufeld	Dec. 13, 1927
1,750,470	Hoenes	Mar. 11, 1930
1,817,332	Worrall	Aug. 4, 1931
1,853,078	Phelps et al.	Apr. 12, 1932
2,269,807	Buckley	Jan. 13, 1942
2,291,553	Mathy et al.	July 28, 1942