Nov. 9, 1937. F. STEGEMANN 2,098,526

MACHINE FOR CLEANING VESSELS, PARTICULARLY BOTTLES

Filed Oct. 7, 1936 3 Sheets-Sheet 1

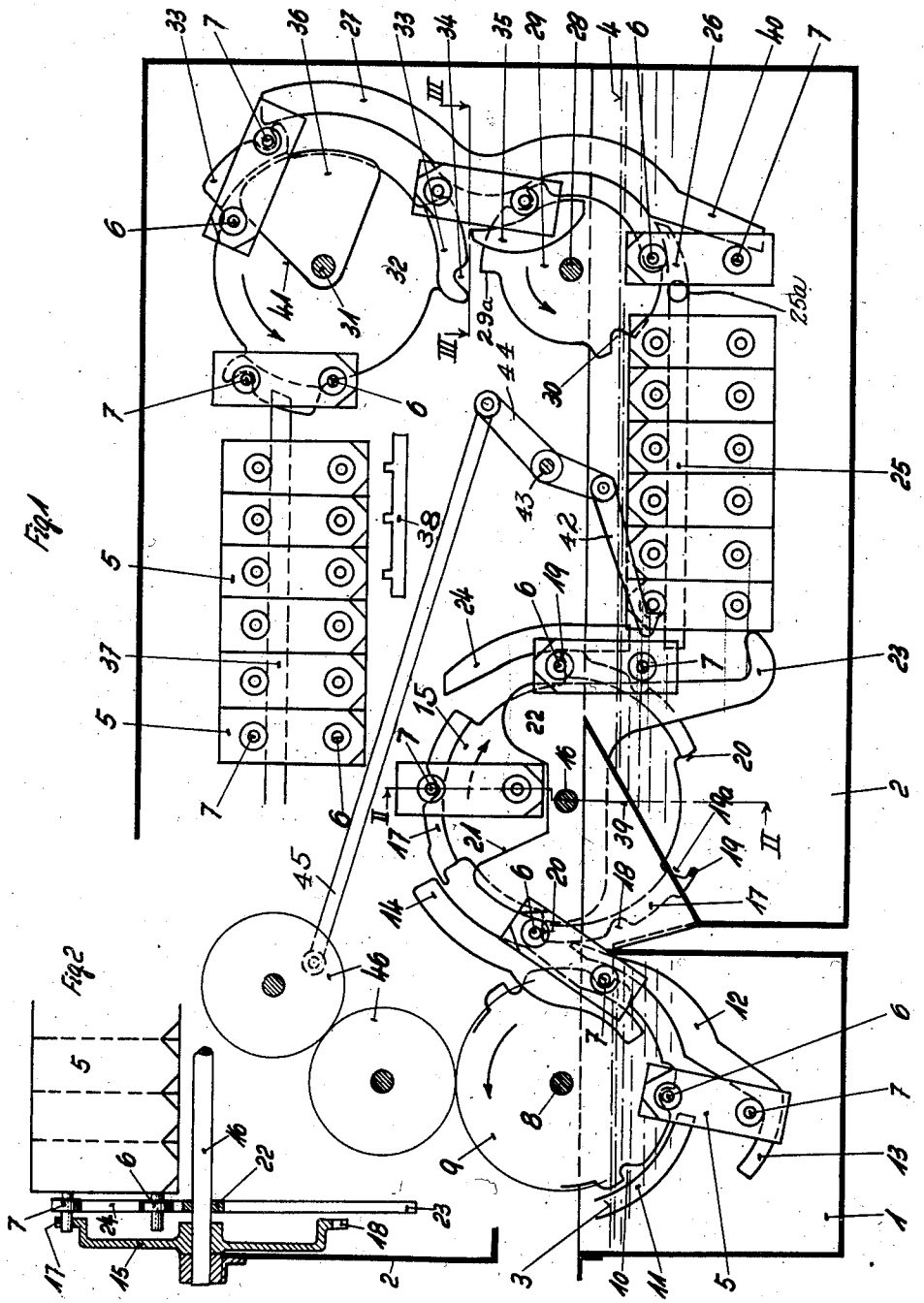


Fig. 1

Fig. 2

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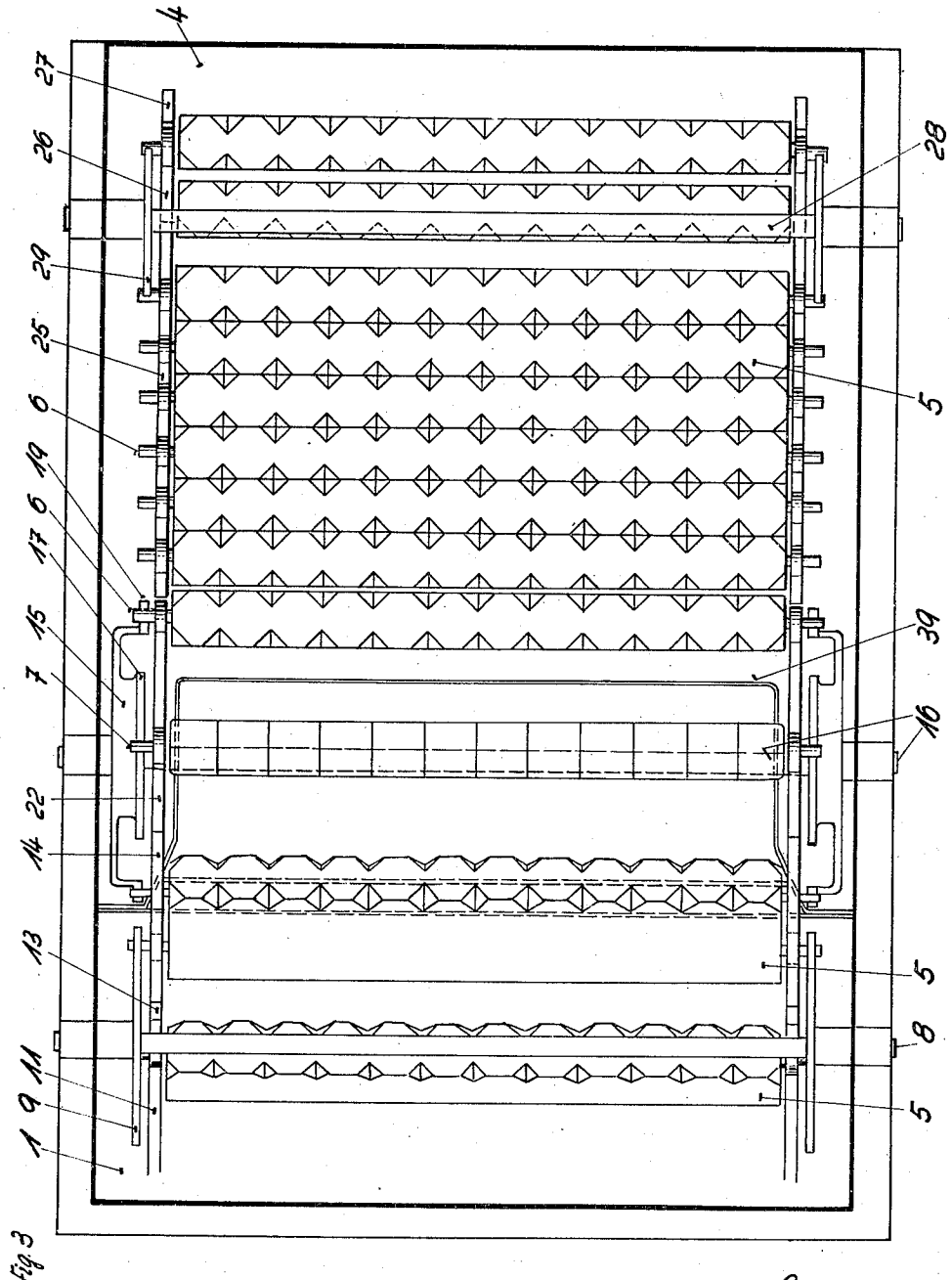


Fig 3

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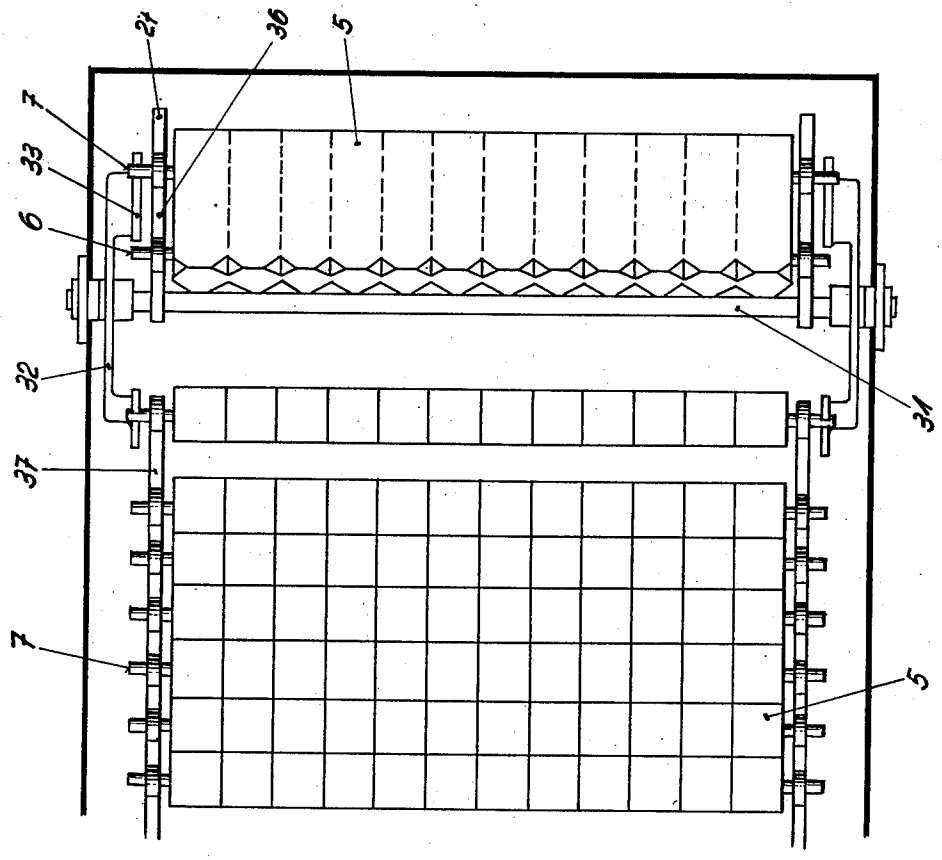


Fig. 4

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MACHINE FOR CLEANING VESSELS, PARTICULARLY BOTTLES

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In Germany July 5, 1933

7 Claims. (Cl. 141—7)

This invention relates to machines for cleaning vessels of all kinds and particularly for cleaning bottles. This application is a continuation-in-part of my application Serial No. 682,508, filed July 27, 1933. Machines of this kind are known which comprise a number of consecutive containers for the cleaning of liquids and through which the vessels to be cleaned are passed in succession. In such machines the vessels, for example, bottles, are placed in individual baskets each accommodating a large number of the vessels. The baskets are then passed through the cleaning liquids in the containers by means of an endless chain, or guide wheels are used which pick up the baskets and transfer them from one to the other so that in this way the baskets together with the vessels to be cleaned are passed through the liquids.

In the last-mentioned arrangement, however, a series of intermediate levers are employed by means of which the individual baskets are directed from one guide wheel to the next. The arrangement of such intermediate levers is, however, inconvenient and also expensive and frequently involves a failure of the apparatus.

In accordance with the present invention, the baskets which contain the vessels to be cleaned are provided with upper and lower pairs of projections at their ends, both of which pairs of projections engage in corresponding recesses in the guide wheels, particularly during transfer from one pair of wheels to another. This results in a wholly positive movement of the baskets through the machine, in contrast to previously known constructions wherein the baskets were at times suspended from a single pair of basket projections, and were consequently exposed to vibrations and shocks which were transmitted throughout the entire machine. It also makes it possible to avoid the intermediate levers of known machines, which levers are uncertain in operation and involve shocks.

In the accompanying drawings illustrating an embodiment of the invention, Fig. 1 is a diagrammatic longitudinal sectional view of the apparatus;

Fig. 2 is a transverse sectional view on line II—II of Fig. 1 with one side omitted;

Fig. 3 is a plan view of the machine in section on the line III—III of Fig. 1; and

Fig. 4 is a plan view partly omitted.

In the embodiment of the invention shown by way of example in the accompanying drawings, the invention is applied to a cleaning machine comprising two containers 1 and 2. Naturally the arrangement may be such that more than two containers are arranged in sequence and the baskets are passed through them one after the other.

In the embodiment shown the preliminary steeping container 1 and the main steeping container 2 are both filled with cleaning liquid up to the levels 3 and 4. The vessels to be cleaned, for instance, bottles, are inserted in baskets 5 which are provided with two pairs of lateral projections 6 and 7, the projections 6 being arranged at the upper tapered ends of the baskets where the mouths of the vessels are disposed, whereas the projections 7 are at the lower parts of the baskets.

In the preliminary steeping container are arranged a pair of guide wheels 9 which are rotatable about the shaft 8 and are driven in the direction of the arrow by means of gear wheels 46 or other suitable driving device. On their peripheries the guide wheels 9 have recesses 10 in which the projections 6 and 7 of the individual baskets 5 can engage. Arranged laterally of each guide wheel 9 is a fixed guide bar 11, and also a further fixed guide bar 12 which at its lower portion is curved up at an angle as at 13. A further pair of fixed bars 14 are arranged laterally and extend upwardly at the forward portion of the guide wheels 9 and which cause the transfer of the baskets to the next pair of guide wheels 15 which are arranged to rotate about the shaft 16 in the main steeping container 2.

These guide wheels 15 rotate in the direction shown by the arrow and have on their peripheries segmentary portions 17 which are constructed in characteristic manner. These segmentary portions are offset inwardly toward each other and then extend radially outwardly as shown in Fig. 2 and have, approximately centrally, a recess 18 and at one end a projecting nose 19 providing a recess 19a, whereas the other end 20 is cut off obliquely. Upon being transferred from wheels 9 to wheels 15 the lower pair of projections 7 of the baskets 5 engage in the recesses 18 whereas the upper pair of projections 6 are engaged by the oblique portions 20.

Disposed laterally of and between wheels 9 is a pair of fixed guide bars 22, which are provided with deep recesses 21 and have downward extensions 23 terminating in hooks. A pair of fixed guide bars 24 is also provided adjacent the wheels 15.

Upon leaving the wheels 15 and guides 22 and 24 the baskets then travel along a pair of rails

25 which extend approximately horizontally in the main steeping container 2 and are provided at their forward ends with pawl-like structures 26 guiding the baskets to a pair of fixed bars 27 each having two adjacent curved portions. In the lower curve of each bar 27 is a guide wheel 29 which is rotatable about shaft 28 and is provided with recesses 30, and in the upper curve of each bar 27 is disposed a second guide wheel 32 rotatable about shaft 31 and carrying on its periphery the segmentary portions 33 with recesses 34. A fixed guide bar is provided at 35 near each lower guide wheel 29 and a fixed bar 36 is arranged adjacent each upper guide wheel 32.

Finally, a pair of rails 37 are disposed above the main steeping container 2 and the individual baskets are deposited on these rails from the last guide wheels 32 with the mouths of the vessels extending downwardly above spraying nozzles 38 of known construction and arrangement.

The mode of operation of the machine is as follows:

By means of an arrangement known per se and not shown in the drawings, the baskets 5 filled with bottles are introduced into the preliminary steeping container 1 with the upper projections 6 on each basket engaging in one of the recesses 10 in the guide wheels 9, the fixed bars 11 holding the projections 6 in the recesses 10. As soon as the basket 5 arrives in the lowermost position in the steeping container, as shown, the lower projections 7 on the basket rest on the upwardly curved portions 13 of the fixed bars 12 and in the continued rotation of the guide wheels are gradually brought into engagement with the next recesses 10 so that then both pairs of projections 6 and 7 engage in recesses 10 of the wheels 9. The basket now lies along the guide wheels 9 and is carried upwardly. In the upward motion the upper projections 6 encounter the fixed guide bars 14 which gradually displace them towards the next guide wheels 15. The oblique sections 20 of the segments 17 of these guide wheels engage the projections 6 and carry them along with them, and in the further rotation the projections 7 pass into the recesses 18 in the segments. Projections 17 of wheels 15 are offset inwardly toward the basket 5 as shown in Fig. 2. The projections 6 are guided on the guide bars 22 and finally pass into the large recesses 21 in these bars so that in the highest position the basket is suspended from the projections 7 with the mouths of the bottles downwardly. In this way the liquid from the preliminary steeping container 1 which is in the bottles is emptied out downwardly. This liquid, however, must not pass to the main steeping container and thus is collected by an oblique wall 39 extending beneath the baskets in this position, and the liquid is either returned to the preliminary steeping container 1 or is discharged to the outside.

In the further rotation of the guide wheels 15 the projections 6 again encounter the stationary guide bars 22 and in this way a further rotation of the basket 5 occurs so that the mouths of the bottles are again directed upwardly. The projections 6 are brought into contact with the fixed guide bars 24 and are guided downwardly between said bars and the downwardly extending portions 23 of the bars 22 until the projections 7 rest at the bottom on the hooked portions of the guide bar. Up to this point the noses 19 prevent the basket from dropping prematurely. The two pairs of projections 6 and 7 are now disengaged from the guide wheels 15 and the projections 6 are at the level of the rails 25 onto which they are advanced by means of a feed mechanism. This feeding device consists of a pair of hooks 42 suspended from bell crank lever 44 which is rotatable about shaft 43. Angle lever 44 is oscillated through rod 45 from one of the gears 46. This enables the hooks 42 to engage behind the upper projections 6 of the first basket suspended on rail 25 and thus moves the whole row of baskets to the right to the extent of the width of one basket. The individual baskets now hang on the rails 25 by means of their projections 6 and with the mouths of the bottles upwardly and are advanced intermittently to the right until they pass over the pawls 26 to the fixed guide bars 27. At this stage the projections 6 on the basket are engaged by shoulders 29a of guide wheels 29 and are carried along thereby the projections being guided upwardly between the guide wheels 29 and the lower curves of the fixed guide bars 27. The projections 7 are guided by the lowermost portions 40 of the fixed bars 27 so that finally they are engaged by subsequent recesses 30. The pawls 26 are pivoted at 25a to rails 25 and are free to fall downwardly and serve to bridge the gap between rail 25 and guide 27. When a basket is entrained by wheels 29, then projections 7 pass along projections 40 of rails 27, lifting pawls 26 upwardly. The pawls 26 fall back to their former position by gravity when free, this position being shown on the drawings.

The projections 6 and subsequently the projections 7 of each basket are displaced from the recesses 30 by means of fixed bars 35. The projections 6 are engaged by the edges of the segments 33 of the upper guide wheels 32 and are guided upwardly along the second curves of the fixed bars 27. In the upward motion the lower projections pass into engagement with the recesses 34. On the other side the guidance is effected by the fixed guide members 36. On arrival at the top the projections 6 of the basket slide downwardly along the oblique edges 41 of the guide members 36 so that the basket is again inverted into the position in which the mouths of the bottles are directed downwardly. In this position the basket which is suspended by the projections 7 in the recesses 34 is transferred to the fixed rails 37. Here the individual baskets are advanced along the rails by the action of wheels 32 pushing more baskets on the rail, and pass over the spraying nozzles 38 whereby they are given a final cleaning internally and if desired externally. The individual baskets are taken from the rails 37 and emptied and then used again for carrying further bottles during cleaning operations.

Naturally, details of the arrangement could be different from those shown in the embodiment described, the important feature being that by the provision of the fixed guide bars and by the characteristic construction of the guide wheels the baskets are passed through the various containers without the use of any movable intermediate levers or the like whatever, whereby the entire construction is very considerably simplified and the operation is rendered wholly reliable.

What I claim is:

1. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, two pairs of rotatably mounted adjacent basket carrying wheels, each of said pairs of wheels having means for engag-

ing both pairs of projections of the baskets, means for guiding the upper ends of the baskets from one pair of carrying wheels to the next pair of carrying wheels, the baskets being so fed by action of the one pair of rotating carrying wheels on the lower pair of projections of the baskets.

2. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, a pair of juxtaposed fluid containers, two pairs of rotatably mounted basket carrying wheels, one of said pairs being located in each container, a pair of guide bars adjacent one of said pairs of wheels for guiding the upper pair of projections of the baskets while being carried along by the pair of wheels adjacent said bars, the said bars being interrupted to allow the lower projections of the baskets to engage with the one pair of wheels, means for guiding the upper end of the baskets from said one pair of carrying wheels to the other pair of wheels, the baskets being so fed by action of the one pair of carrying wheels on the lower projections of the baskets.

3. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, two pairs of rotatably mounted adjacent basket carrying wheels, each of said pairs of wheels having means for engaging projections of the baskets, means for guiding the upper end of the baskets from one pair of carrying wheels to the other pair of wheels, the baskets being so fed by action of the one pair of rotating carrying wheels on the lower pair of projections of the basket, said other pair of carrying wheels comprising disks spaced farther apart than the outer lateral dimension of the basket projections and having flanges projecting inwardly toward each other and radially outwardly, a guide between and within the peripheries of said other pair of wheels for holding the upper projections of the baskets at the peripheries of the said other pair of wheels, said guide being provided with a deep recess adjacent the upper side of the other pair of wheels whereby the upper ends of the baskets are permitted to swing downwardly and the originally lower end of the basket passes over the originally upper end and precedes the originally upper end in the downward movement along said other pair of wheels, whereby the baskets are completely rotated by the action of said other pair of carrying wheels and the guide therebetween.

4. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, two pairs of rotatably mounted adjacent basket carrying wheels, means for guiding the upper end of the baskets from one pair of carrying wheels to the other pair of wheels, the baskets being so fed by action of the one pair of carrying wheels on the lower projections of the baskets, the other pair of wheels having peripheral recesses and intermediate segmental extensions, said extensions being provided with forward surfaces for engaging the upper projections of the baskets and peripheral seats for the lower projections of the baskets, guides within the peripheries of the other wheels for the upper pair of basket projections on the side of said other wheels toward the first pair of wheels, said guides being discontinuous at the top portion of the other pair of wheels, and an abutment for the upper projections of the baskets toward the side of the other pair of wheels opposite the first pair of wheels for moving the said upper projections into engagement with the rear ends of the segmental extensions.

5. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, two pairs of rotatably mounted adjacent basket carrying wheels, means for guiding the upper end of the baskets from one pair of carrying wheels to the second pair of wheels, the baskets being so fed by action of the one pair of carrying wheels on the lower projections of the baskets, the second pair of wheels having peripheral recesses and intermediate segmental extensions, said extensions being provided at the centers of their outer peripheries with seats for projections of the baskets, and the forward and rear ends of the extensions having abutment surfaces for engaging the free projections of the baskets, a pair of guides within the peripheries of the second wheels for the upper basket projections on the side of said second pair of wheels toward the first pair of wheels, said guides being discontinuous at the top portion of the second pair of wheels, and abutments for the upper projections of the baskets toward the side of the second pair of wheels opposite the first pair of wheels for moving the said projections into engagement with the rear ends of the segmental extensions.

6. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, two pairs of rotatably mounted adjacent basket carrying wheels, means for guiding the upper end of the baskets from one pair of carrying wheels to the second pair of wheels, the baskets being so fed by action of the one pair of carrying wheels on the lower projections of the baskets, the second pair of wheels having peripheral recesses and intermediate segmental extensions, said extensions being provided at the centers of their outer peripheries with seats for projections of the baskets, and the forward ends of said extensions having abutment surfaces for engaging the upper projections of the baskets, the rear ends of the extensions having abutment surfaces on rearwardly extending noses to prevent premature dislodgment of the baskets from the extensions, a pair of guides within the peripheries of said second pair of wheels on the side of said second pair of wheels toward the first pair of wheels, said guides being discontinuous at the top portions of the second wheels, and abutments for the upper projections of the baskets toward the side of the second pair of wheels opposite the first pair of wheels for moving the said projections into engagement with the rear abutment surfaces of the segmental extensions.

7. In a machine for cleaning vessels, a plurality of baskets each accommodating a plurality of said vessels, said baskets having upper and lower pairs of lateral projections, a container for cleaning fluid, a pair of rails extending within the container and along which the baskets travel, a pair of rotatably mounted transporting wheels within the container receiving baskets from the rails, said wheels having recesses for receiving the upper basket projections, a pair of guide bars adjacent said wheels and along which said wheels convey the upper basket projections, a second pair of rotatably mounted transporting wheels

above the first wheels, a pair of fixed guides extending partially around and spaced from the peripheries of the second pair of wheels, another pair of guides between and within the peripheries of said second pair of wheels, said guides cooperating with said second pair of wheels and the basket projections to invert the baskets, a pair of rails disposed above the container and receiving the inverted baskets from the second wheels, and spraying nozzles beneath the said rails and directed upwardly to the inverted vessels.

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