

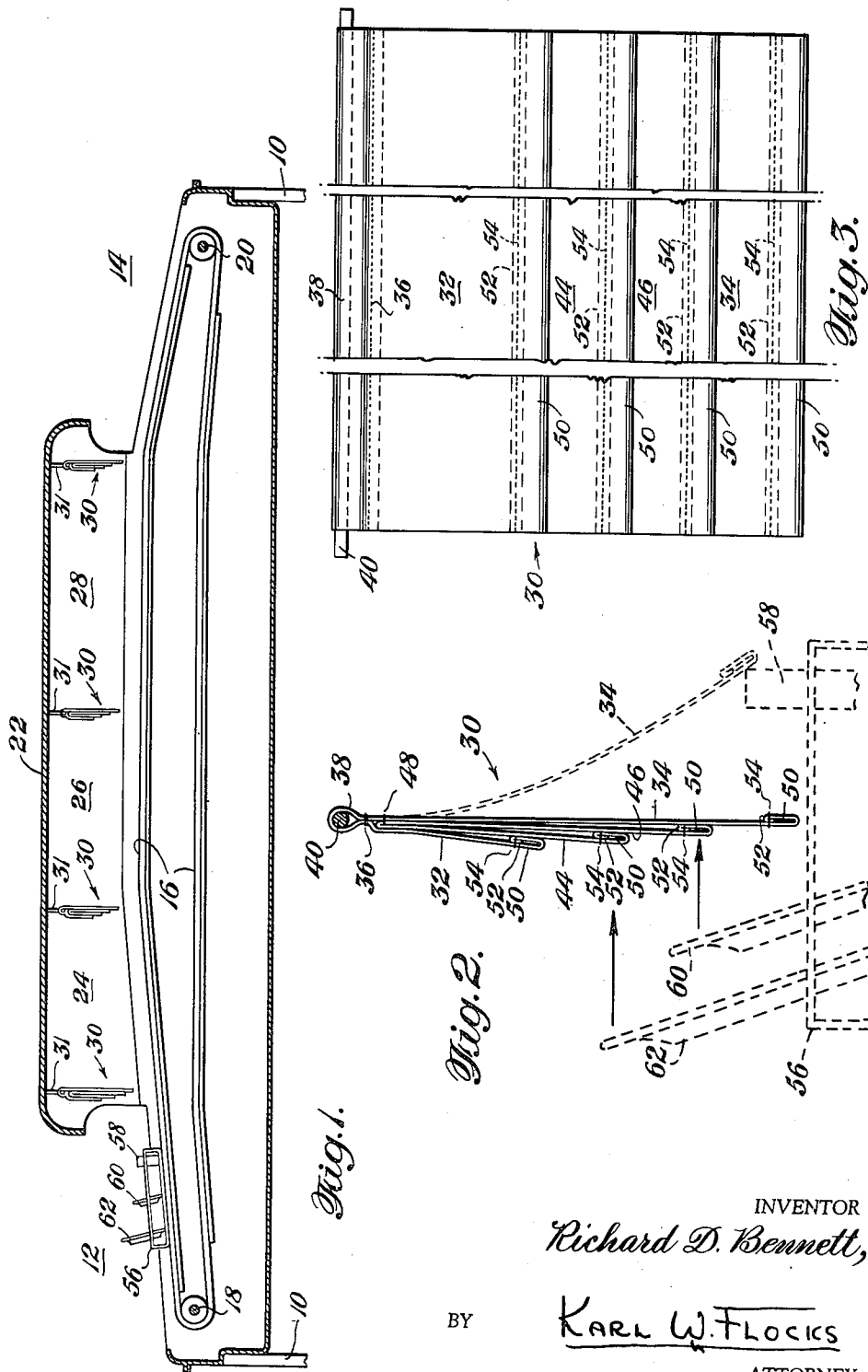
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DISHWASHER WITH MULTI-FLAP CURTAIN

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DISHWASHER WITH MULTI-FLAP CURTAIN

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The present invention relates to a curtain for a commercial dishwasher. More particularly, the present invention relates to a multi-flap curtain for use in a commercial dishwasher which is adapted to confine steam and water in the various cleaning stations in the dishwasher.

Dishwashers which are utilized in commercial installations are generally constructed such that the dishes to be washed are placed in racks which are, in turn, moving on a conveyor means. The racks enter a scrapping station in the dishwasher where the food is removed from the dishes by a spray of hot water. The racks of dishes then move to a washing station where they are washed clean and are finally moved to a rinsing chamber to receive a spray of rinsing water. During the cleaning operation, it is necessary to prevent water from splashing outside the machine and, moreover, to prevent contaminated water from entering the washing and rinsing stations. Thus, it has been the practice to confine the scrapping station, washing station, and rinsing station into separate areas by positioning partitions between the individual stations. However, since the racks of dishes must be continuously moved from station to station, the partitions separating the stations are generally fabricated from a flexible material. The flexible partitions are also positioned adjacent the ends of the dishwasher and are thereby adapted to prevent steam and water from escaping outside the machine.

Prior to the instant invention, it has been the practice in the dishwashing art to form the flexible partitions in the form of curtains which are positioned between the cleaning stations in the dishwasher and at the ends of the housing thereof. These heretofore known flexible curtains were generally formed of a single layer duck material and, although the purpose of the curtains was to confine the steam and water to the various cleaning stations within the dishwasher, they were usually inefficient in use and allowed overexcessive quantities of water and steam to escape from the cleaning stations. Moreover, the continuous passage of the racks of dishes through the dishwasher caused the curtains to wear out in a relatively short period of time. As a result, the dishwasher curtains known heretofore had to be replaced at frequent intervals, resulting in a considerable loss of time, labor and materials. The present invention, in meeting the problem of providing a curtain for restricting water and steam to the cleaning station and reducing the wear on the curtain due to the frequent passage of dishes through the dishwasher, includes an arrangement whereby a plurality of independently formed flaps are formed in a single curtain structure, the curtain structure being suspended from the top of the dishwasher housing. The independently formed flaps are fabricated such that they have varying vertical dimensions, and are suitably secured together to form a stepped arrangement. By forming the folds in varying vertical dimensions, a complete curtain unit is formed whereby when a rack of dishes strikes the suspended curtain, the flap corresponding to the height of the dishes is contacted thereby. Since only the flap corresponding to the height of the dishes is contacted,

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the remaining flaps positioned above the dishes will maintain their vertical position and thereby confine the spray of water and steam in the dishwasher. Furthermore, since the dishes only contact a single flap at a time, the usual wear normally associated with dishwasher curtains is considerably reduced.

It is, therefore, an object of the present invention to provide a multi-flap curtain for a commercial dishwasher which is adapted to confine the spray of steam and water within the dishwasher.

Another object of the present invention is to provide a multi-flap curtain for a dishwasher wherein, during the normal dishwashing operation, the wear on the curtain is reduced.

Still another object of the present invention is to provide a curtain for a dishwasher which is formed in a plurality of independently hanging flaps.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a vertical sectional view of a dishwasher illustrating the curtain embodied in the present invention positioned at various cleaning stations in the dishwasher;

Fig. 2 is a side elevational view of the curtain embodied in the present invention, a rack of dishes being illustrated in dotted lines showing the relationship of the advancing dishes with respect to the curtain flaps; and

Fig. 3 is a front elevational view of the curtain illustrated in Fig. 2.

In general, the present invention comprises a curtain for use in a dishwasher which is adapted to confine the spray of steam and water within the dishwasher and within the various stations in the dishwasher. The curtain may be formed of any suitable material such as duck, rubber or a plastic fabric, or a cloth material may be treated with a plastic composition. The curtain embodied in the present invention is formed in individual flaps, the flaps being sewed together to form the complete curtain unit. The dimensions of each flap in the curtain may vary with the requirements for a particular dishwasher and the number of flaps may be varied without departing from the spirit of the invention.

Referring to the drawings, and particularly Fig. 1, a dishwasher adapted to be employed in a commercial installation is illustrated. The dishwasher includes a base 10 and is provided with a loading end 12 and an unloading end 14. In order to provide for the continuous movement of dishes through the dishwasher, a conveyor 16 of the endless belt type is operatively connected to pulleys or sprockets 18 and 20, the pulleys being mounted in the base 10. The pulley 20 is rotated by a suitable source of power (not shown), thereby actuating the conveyor 16. Positioned on the base 10 between the loading end 12 and the unloading end 14 is an enclosed housing 22. The housing 22 houses the individual dishwasher cleaning areas which comprise a scrapping station 24, a washing station 26 and a rinsing station 28. Suitably positioned, but not shown, in the various cleaning stations within the housing 22 are spray headers provided with nozzles which direct hot water onto the dishes as they pass through the cleaning stations. In order to prevent splashing of water from the dishwasher and to confine the steam and water within the cleaning stations in the housing 22, a plurality of curtains generally indicated at 30 are provided and are suspended from arms 31 which are secured to the top of the housing 22.

Referring now to Figs. 2 and 3, the construction of a curtain 30 is illustrated, the complete curtain unit 30 including a plurality of vertically disposed flaps. In the construction of the curtain embodied in the present invention, the multi-flap arrangement includes a shortened flap

32 which is formed integral with a main flap 34, the shortened flap and main flap being secured together adjacent the topmost end of the curtain along a stitch line 36. The excess material above the stitch line 36 thereby forms a sleeve 38 which is adapted to receive a rod 40. In position on the dishwasher, the rod 40 is disposed with its longitudinal axis horizontal and engages a pair of arms 31, thereby suspending the curtain 30 in the proper position within the housing 22, as illustrated in Fig. 1. Referring again to Fig. 2, positioned between the shortened flap 32 and main flap 34 is a first intermediate flap 44 which is formed integral with a second intermediate but longer flap 46. The flaps 44 and 46, are formed in a single piece of material and folded to form separate flaps. The separate flaps 44, 46 are secured to the main flap 34 adjacent the stitch line 36 along a stitch line 48 and thereby complete the curtain unit. By securing the flaps 32, 44, 46 along the upper end of the main flap 34, each flap is provided with an exposed face. As a result, each flap is thus forced to move in response to a moving object contacting the exposed face thereof, the moving object taking the form of, for example, a rack of dishes. In order to prevent the bottom of each flap curling after being subjected to continuous contact by the dishes, a hem 50 is folded over from each flap face. The hem 50 is then turned to form a hem edge 52, the hem 50 and hem edge 52 being stitched to each flap face along a stitch line 54. By forming the hem 50 and the hem edge 52, a weighted end for each flap is provided, the weighted ends being adapted to prevent the various flaps from curling. In addition, the hem 50 and the hem edge 52 provide a wearing edge that is adapted to withstand the wear normally brought about by the movement of dishes thereagainst. It is also contemplated, in order to reduce wear on the individual flaps and to prevent curling thereof, to suitably attach a plastic coated material to the lower portion of each flap.

In operation, the curtains 30 are positioned in a dishwasher, as illustrated in Fig. 1, and a rack of dishes 56 is placed at the loading end 12 of the dishwasher. The rack of dishes will include dishes of varying heights, such as a glass 58 and dishes 60, 62. The conveyor belt 16 advances the rack 56 through the cleaning stations in the housing 22 and the various dishes will then strike a corresponding flap of the curtains 30. For example, as the rack 56 approaches the scraping station 24, the glass 58 will strike the main flap 34 but will pass under the intermediate flaps 44, 46 and the shortened flap 32, thereby leaving these flaps in their vertically suspended position. As illustrated in dotted lines in Fig. 2, the flap 34 has been moved rearwardly with the movement of a glass 58 thereagainst, leaving the other flaps in their suspended position. The dish 60, as it approaches the scraping station 24, will strike the longer intermediate flap 46, but will pass under the intermediate flap 44 and the shortened flap 32, and the larger dish 62 will strike the shorter intermediate flap 44 leaving the shortened flap 32 in its vertically suspended position. It is apparent that if a stack of dishes of one height is moved through the housing 22, the flap corresponding in height to the dishes will be contacted. The remaining flaps positioned above the flap contacted will then remain in their vertically suspended position and will thereby act to prevent steam and water from spraying into an adjacent station or out on the floor beyond the loading and unloading ends of the dishwasher. As the rack 56 passes through the various stations in the housing 22, each curtain 30 will be contacted and the flaps corresponding to the height of the dishes will then be moved rearwardly to allow the rack of dishes to pass into the various stations.

By providing a commercial dishwasher with curtains embodying the multi-flap arrangement described above, the wear normally associated with dishwasher curtains is materially reduced. Therefore, the normal life or use

of the multi-flap curtain is considerably increased over those curtains known heretofore. Since the multi-flap curtain aids in reducing splashing of water from the dishwasher and tends to prevent water and steam from escaping into adjoining cleaning stations, the washing and rinsing operations are free from contamination.

The multi-flap curtain embodied herein is also of simple construction and is therefore easy to fabricate, and, although the present invention includes a curtain formed of two pieces of material arranged in four separate flaps, it is within the scope of the invention to provide any number of flaps formed in various sizes and which may be formed in individual pieces of material.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. In a dishwasher having a plurality of cleaning stations, a conveyor for conveying racks of dishes to be cleaned through said cleaning stations, curtains separating said cleaning stations for confining steam and water therein, means for supporting said curtains in said cleaning stations, each of said curtains comprising a plurality of vertically hanging flaps that are independently movable in pivotal relation about said supporting means, said flaps being formed in successively varying vertical lengths so that the lower edges thereof are disposed in stepped vertical relation with respect to one another, the shortest flap of each curtain being nearest to a cleaning station inlet, and the remaining flaps graduating in increasing size therebehind, the longest flap being nearest to the cleaning station outlet, whereby a dish disposed on a moving rack engages one of said flaps and moves only those flaps corresponding to and extending below the height of said dish, the lower edges of said flaps being reinforced to prevent curling and wear thereof due to contact with said dishes.

2. In a dishwasher as set forth in claim 1, wherein said longest flap extends the length of said curtain, and said shortest flap is joined to said main flap and extends downwardly a portion of the length thereof, said longest flap and shortest flap being stitched together adjacent the upper end of the curtain to define a sleeve for receiving said supporting means therein, said remaining flaps being positioned between said longest flap and shortest flap and secured thereto below the stitching defining said sleeve, all of said flaps thereby being freely supported for independent movement in response to contact by said dishes.

3. In a dishwasher having a plurality of cleaning stations, a conveyor for conveying racks of articles to be cleaned through said cleaning stations, curtains separating said cleaning stations for confining steam and water therein, means for supporting said curtains in said cleaning stations, each of said curtains comprising a plurality of vertically hanging flaps that are formed in successively varying vertical lengths, the shortest flap of each curtain being nearest to a cleaning station inlet, and the remaining flaps graduating in increasing size therebehind, the longest flap being nearest to the cleaning station outlet, whereby an article located on a moving rack engages one of said flaps and moves only those flaps corresponding to and extending below the height of said article.

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