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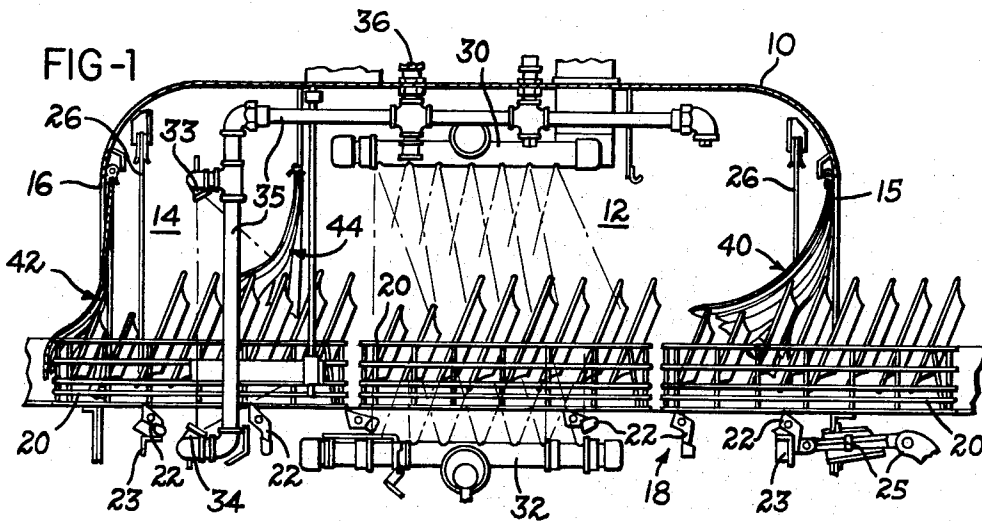
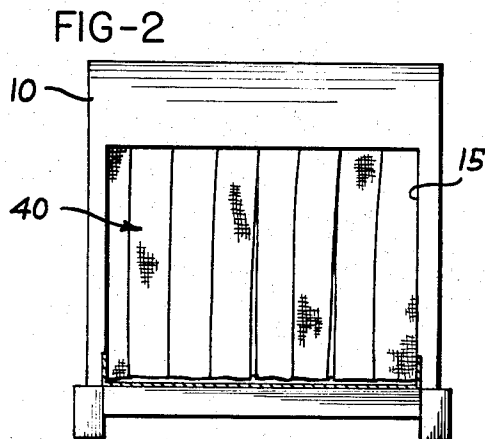
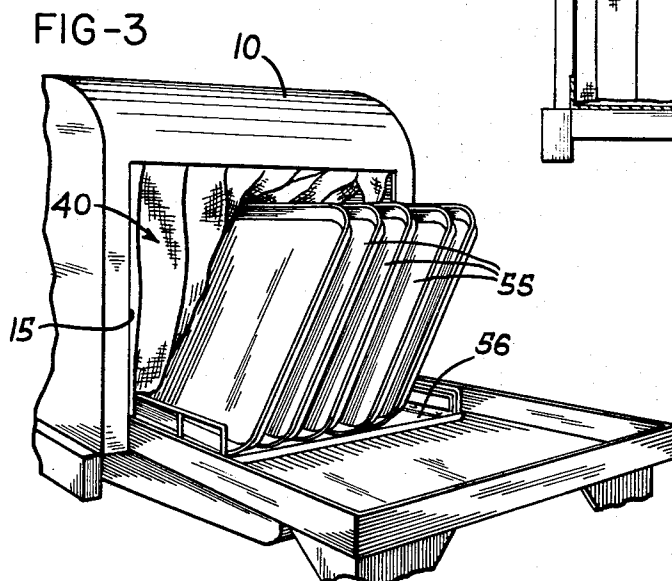
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3,254,698

SPLASH CURTAINS FOR DISHWASHING MACHINES

Filed May 20, 1963

2 Sheets-Sheet 1



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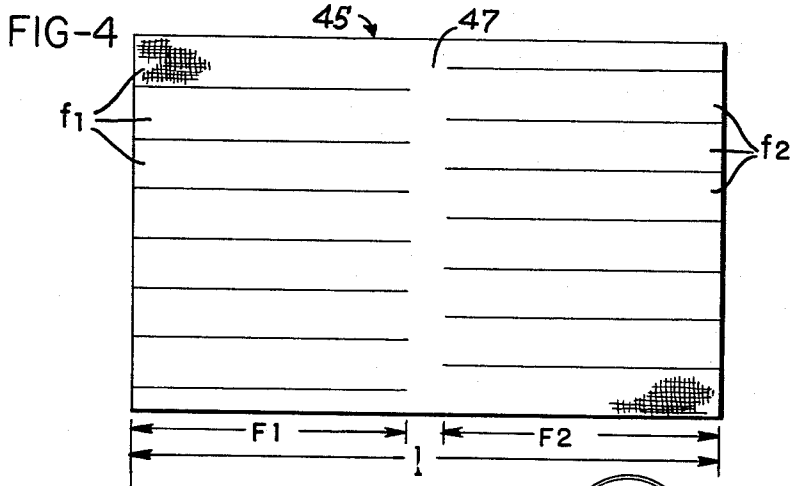
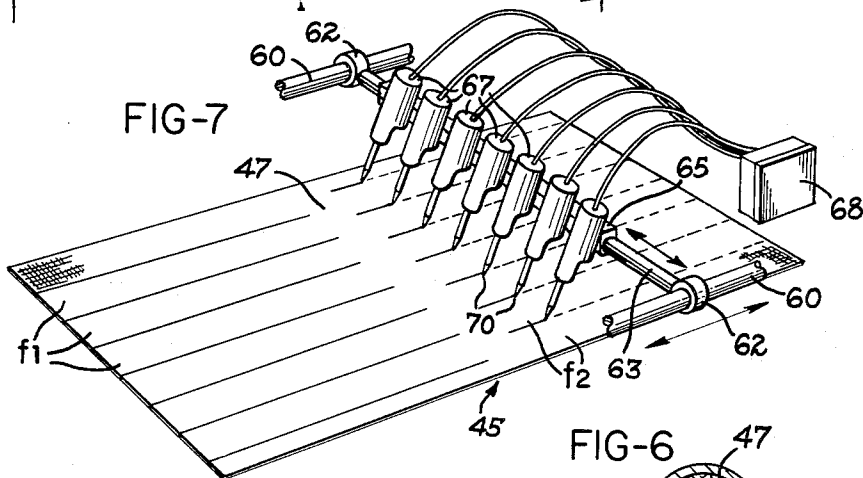
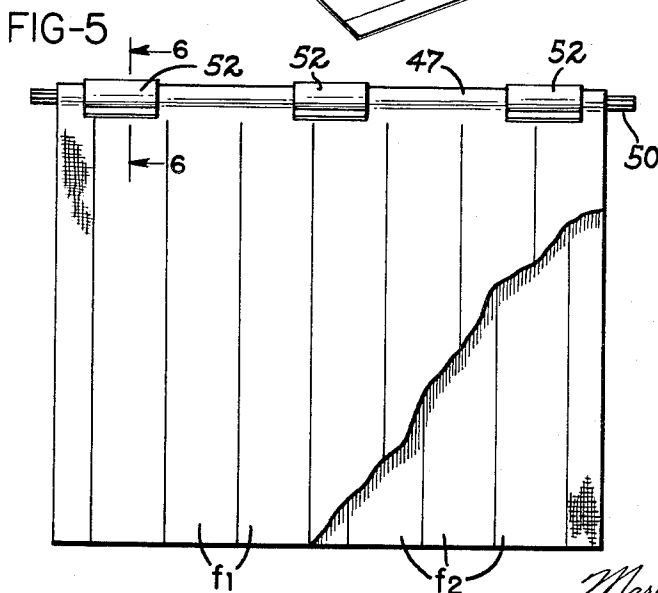
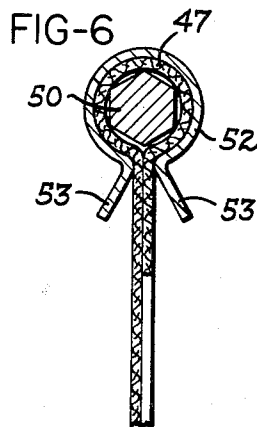
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SPLASH CURTAINS FOR DISHWASHING MACHINES

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2 Sheets-Sheet 2



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3,254,698 SPLASH CURTAINS FOR DISHWASHING MACHINES

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This invention relates to dishwashing machines, particularly machines used in commercial establishments, such as restaurant kitchens and the like, and especially to a novel splash curtain construction incorporated in such machines.

The present invention is primarily adapted for use in various types of large dishwashing machines. Machines of this type are shown in U.S. Patents Nos. 2,073,521 and 2,884,935, wherein typical locations of splash curtains are indicated. Generally speaking, the curtains function to prevent sprayed cleaning liquid from splashing outside of a particular compartment or chamber of the machine, while permitting the articles being cleansed to be carried, for example by suitable conveyor mechanisms, into and out of the machine and through the various washing and rinsing compartments. Thus, the curtains normally hang across the openings through which it is desired to prevent splashing of liquid, and the curtain structure is such that it will move away, usually flexing over or around the articles passing by it.

The curtains are thus subjected to a soaking spray of liquid during use, and this liquid may be of rather high temperature, and in certain cases may have mixed with it an amount of detergent or other cleansing agent, or a rinsing agent. Obviously, just what type of liquid is sprayed against the curtain will depend upon its location in the machine. However, in manufacturing and supplying curtains, both for new and replacement use, it is not practical to have different types for different uses, and therefore the material from which the curtain is made must be capable of withstanding all conditions to which it might be subjected in any use in a dishwashing machine.

One of the chief factors in deterioration of the curtain material is rotting, due to constant soaking of the materials during periods when the machine is in use, followed by air drying of the curtains when the machine is idle. Various materials have been employed, and one of the most popular is a tight woven canvas duck. Such curtains have been formed from a plurality of strips fastened to a mounting piece of the same material, which is in turn adapted for connection to a mounting rod. Because of abrasion to this material, as well as the other deteriorating actions mentioned previously, it is necessary to stitch a hem or border on each of the strips, and likewise the strips are sewn to the mounting piece. The construction of such curtains therefore involves a substantial amount of labor and expense.

The primary object of this invention is to provide a splash curtain which can function at least equally well as prior art curtains of the same general configuration, and which can be manufactured quickly and with relatively little expense as compared to prior splash curtains, and which can readily be mounted in or removed from a dishwashing machine.

Another object of the invention is to provide a novel splash curtain formed from a single piece of woven material which is divided into a pair of flaps connected through an integral section of the sheet, and with each flap in turn divided into sub-flaps arranged to overlap the openings between sub-flaps formed from the other flaps.

Another object of the invention is to provide such a splash curtain wherein the curtain is formed from a uni-

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tary sheet of material formed from closely woven threads of a synthetic fibre such as polypropylene, and wherein all edges of the aforementioned flaps and sub-flaps are fused or heat-sealed during manufacture to prevent fraying of the edges of these parts during use of the curtain.

An additional object of the invention is to provide a novel method of manufacturing splash curtains, particularly for use in dishwashing machines.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings:

FIG. 1 is a somewhat schematic vertical section view taken through a typical dishwashing machine incorporating the splash curtains of the present invention;

FIG. 2 is an end view of the entrance opening of the machine, as viewed from the right of FIG. 1, showing the splash curtain hanging in its normal position covering the entrance opening.

FIG. 3 is a perspective view of the entrance opening and a part of the table leading thereto, showing a rack with a plurality of trays supported thereon, passing through the splash curtain into the machine;

FIG. 4 is a plan view of a splash curtain according to the present invention, with the flaps thereof laid out flat to show the relationship of the parts with respect to the outline of the sheet material from which the curtain is formed;

FIG. 5 is a detail view of the curtain mounted on a supporting rod, and with part of some of the sub-flaps broken away to show the overlapping relation thereof with the sub-flaps on the other half of the curtains;

FIG. 6 is a sectional detail view on an enlarged scale, taken on line 6—6 in FIG. 5, and illustrating the manner in which the curtain is fastened on its mounting rod; and

FIG. 7 is a schematic perspective view illustrating a method of manufacturing a splash curtain according to the present invention.

Referring to the drawings, which illustrate a preferred embodiment of the invention, one form of dishwashing machine to which the present invention pertains is shown in FIGS. 1—3. Details of such a machine are well known, and are described in said Patent No. 2,073,521, therefore only the general arrangement is described herein for the purposes of understanding the invention.

The machine has a housing 10 divided into a washing chamber 12 and rinsing chamber 14. The entrance opening is at 15, the discharge opening or exit is at 16, and conveyor mechanism 18 operates to move the racks 20 through the chambers. In this form of conveyor, which includes a number of pawls 22 on a frame (portions shown at 23), there is an oscillating drive 25, and the conveyor structure is suspended on flexible bands 26.

Washing liquid, such as hot water with a detergent or similar agent added, is recirculated through the upper and lower wash spray units 30 and 32 from a tank beneath the conveyor, by a conventional motor driven pump (not shown). Rinsing liquid is sprayed from the upper and lower rinse spray heads 33 and 34. This rinse is usually hot fresh water, supplied from a manifold 35 which is coupled to the hot water supply pipe 36. The spray patterns in the two chambers are indicated by dash lines. These may be considered typical, but it is understood that some machines use rotary spray heads, and there may be dual washing chambers, a power scrapping chamber, and other additional features known in this art.

The entrance and exit and the partition between chambers are normally covered by flexible curtains which substantially prevent splashing of the spray out of the housing, or between chambers. Thus, in the machine shown there is an entrance curtain 40, an exit curtain 42, and a partition curtain 44 between chambers 12 and 14. The

curtain 44 may be somewhat shorter than the others, but in all essential respects the curtains are the same, and further description as applied to curtain 40 is applicable to all.

Details of a curtain according to the invention are shown in FIGS. 4, 5 and 6. The curtain 40 is formed from a single or unitary sheet of material 45, woven or similarly formed of synthetic fibers which are essentially non-rotting. A preferred material is of closely woven polypropylene fiber, but other synthetic heat-sealable cloth can be used, as can certain non-woven synthetic sheets.

The sheet 45 has a central area or band 47 across its width, and on opposite sides of this area are the main flaps F1 and F2. Thus the length *l* of the sheet is slightly greater, by the width of band 47, than the height of the operative flaps of a curtain. Each of the flaps F1 and F2 is divided into a plurality of sub-flaps *f*1 and *f*2, and these sub-flaps are arranged to overlap the slit or separation between the sub-flaps in the opposite main flap, as shown particularly in FIG. 5.

The curtain is mounted by draping the central band 47 over a rod 50, and placing a number of open end cylindrical spring clips 52 over the central band to hold it around the rod. Preferably the rod 50 is coated with a plastisol to avoid corrosion, and the clips 52 are made of a small piece of stainless steel formed into a cylinder with an open side and guiding wings 53 which assist in snapping the clips in place.

The function of the curtains is known, and is apparent from FIG. 3 wherein an aggravated splashing situation is shown. Here a number of trays 55 in a rack 56 are shown entering the housing 10. The sub-flaps of curtain 40 are shown being pushed aside by the trays, but those sub-flaps not engaged hang vertically while the others move as necessary, thus substantially blocking the spray from splashing out through the entrance opening.

FIG. 7 illustrates the novel method of manufacturing a splash curtain according to the invention. The synthetic fibers can be severed by applying localized heat at the requisite temperature. In effect this action melts the fibers and the molten or partially molten material fuses into a bead or edging which is in effect heat-sealed. Thus, there are no loose edges of fibers where the slits are made to form the sub-flaps, and fibers will be prevented from unraveling, as by catching on articles passing the curtain. Suitable material ordinarily can be obtained in the form of the sheets 45.

This is done in a quick and effective manner by using a heated wire to cut the synthetic material, whereby the separation into the sub-flaps is accomplished and the sides of the cuts are heat-sealed simultaneously. A suitable arrangement for performing the method is shown in FIG. 7, where a pair of guide rods 60 form a sliding support for the bearings 62 of a cross-rod 63. Rod 63 in turn provides a sliding support for a carriage 65, thus the carriage can be moved both lengthwise and crosswise of the sheet, as indicated by the arrows. Suitable stops (not shown) can be provided to limit these movements.

On the carriage are a plurality of "hot-wire" cutters, for example in the form of conventional electric soldering guns 67. These devices generally incorporate a transformer, energized from the A.C. supply 68, which is connected to a heating element or wire 70. The guns are spaced on the carriage such that wires 70 are spaced according to the desired width of the sub-flaps.

The wires 70 can be brought into engagement with a sheet 45 to form the slits between the sub-flaps *f*1, then raised over the band or area 47 as by tilting the carriage, shifted crosswise to align the slits between sub-flaps *f*2 with the center of sub-flaps *f*1, and lowered to cut the slits in flap F2. In FIG. 7 the apparatus is shown beginning to cut these last-mentioned slits.

From the foregoing description it will be understood that the method of manufacturing splash curtains according to the present invention involves the cutting of slits

in a sheet of material having the desirable heat-sealing characteristics, by means of one or more heated wires. The arrangement illustrated in FIG. 7, is preferred, but obviously other suitable mechanisms could be provided for accomplishing the same function, or the slits could be cut one at a time while still achieving a substantial saving in labor.

No stitching of the edges of the sub-flaps is required, since the synthetic fibers fuse to form a heat-sealed edge which has been found satisfactory as regards resistance to abrasion, etc. Furthermore, the one-piece splash curtains are easily mounted and removed from the supporting rods, merely by removing the clips 50, should it be necessary to replace one of the curtains in the machine.

While the method and form of apparatus herein described constitute a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise method and form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A splash curtain for use in dishwashing machines, said curtain comprising a unitary sheet of material formed of woven synthetic fibers and having a central area adapted to be draped over an elongated supporting rod extending across the opening to be covered by the curtain and defining on opposite sides thereof two main flaps of approximately the same area arranged to hang normally in a vertical direction from opposite sides of the rod and in close face to face relationship to each other, each of said main flaps having a plurality of narrow spaced slits therein extending from the edges thereof opposite said central area toward said area dividing said main flaps into a plurality of sub-flaps extending in close side by side relation and with the slits being of such dimension that the adjacent edges of sub-flaps are in near contacting relation whereby the space between adjacent sub-flaps is substantially smaller than the width of the sub-flaps, the slits in one of said main flaps being offset with respect to the slits in the other main flap by an amount approximately equal to one half the width of a sub-flap whereby the sub-flaps in one main flap overlap the slits in the other main flap when said sheet is draped over a support rod, and the material at the edges of each of said sub-flaps bordering on said slits being sealed by fusing of the synthetic fibers to resist fraying of the material along said slits.

2. A splash curtain as defined in claim 1 wherein said sheet material is formed of woven fibers of polypropylene.

3. A splash curtain particularly adapted for use in dishwashing machines to contain a spray of water within a chamber, said curtain comprising an elongated support rod adapted for mounting extending across the opening to be normally closed by the curtain, a unitary sheet of heat sealable synthetic woven material such as polypropylene draped over said rod to form opposite main flaps of approximately the same area, means retaining said sheet on said rod and held around said rod to maintain said main flaps normally hanging in a generally vertical direction from opposite sides of said rod and close to each other whereby the two main flaps cooperate to form a single curtain structure for covering the opening, each of said main flaps having a plurality of slits therein extending from the edges of said flaps opposite said rod to an area adjacent said rod leaving a unitary portion of said sheet extending around said rod, said slits being of such narrow width that the space formed by a slit is a minor fraction of the width of the material between any two of said slits, and said slits in one of said main flaps being offset with respect to said slits in the other said main flap to form in each said flap a plurality of sub-flaps which extend and overlap to a substantial extent across the slits in the other main flap such that said sub-flaps are arranged in staggered

relation and function to prevent passage of spray through said slits.

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