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M. O. ROSS

3,102,093

DRY CLEANING APPLIANCE

Filed April 26, 1962

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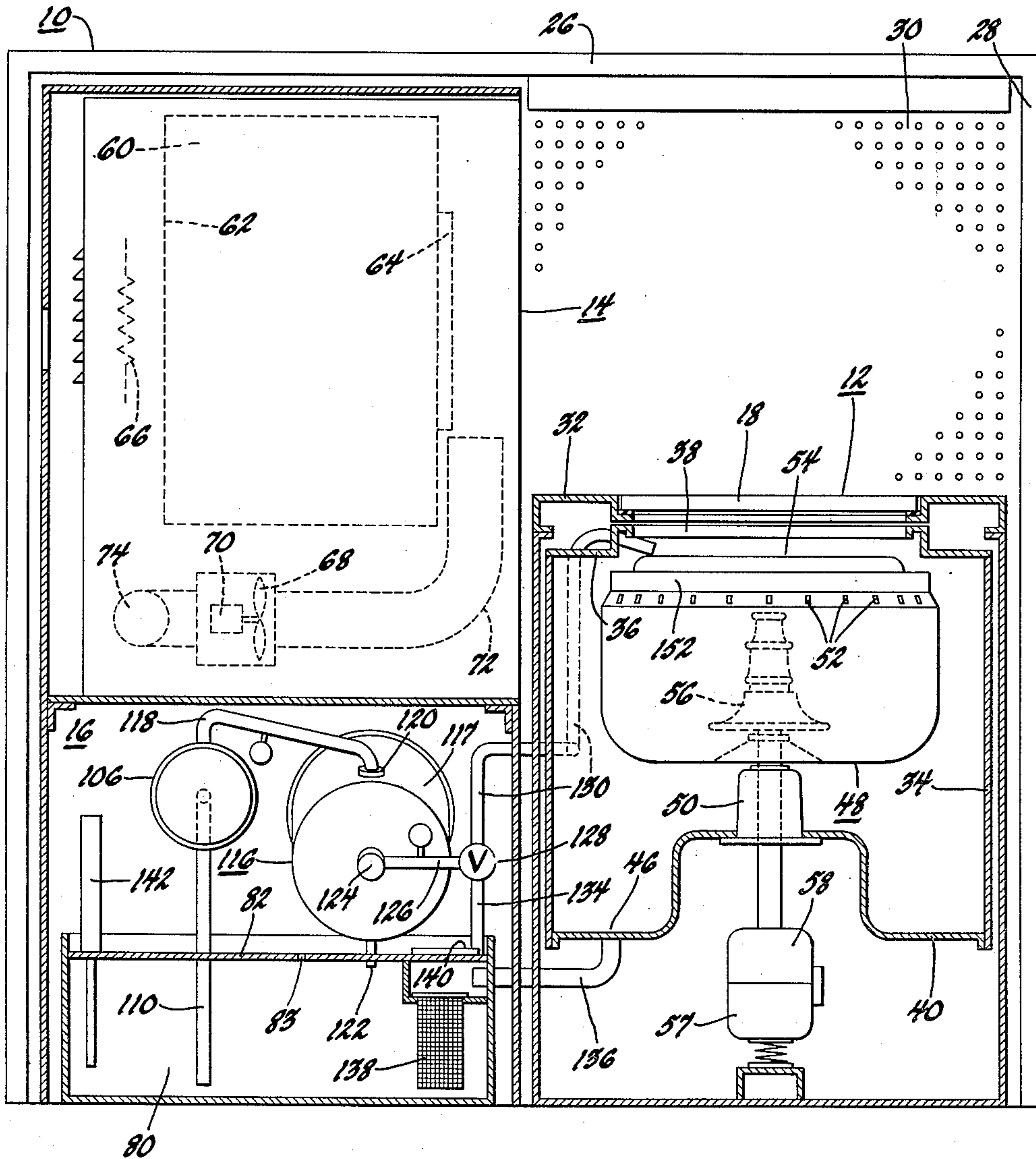


Fig. 1

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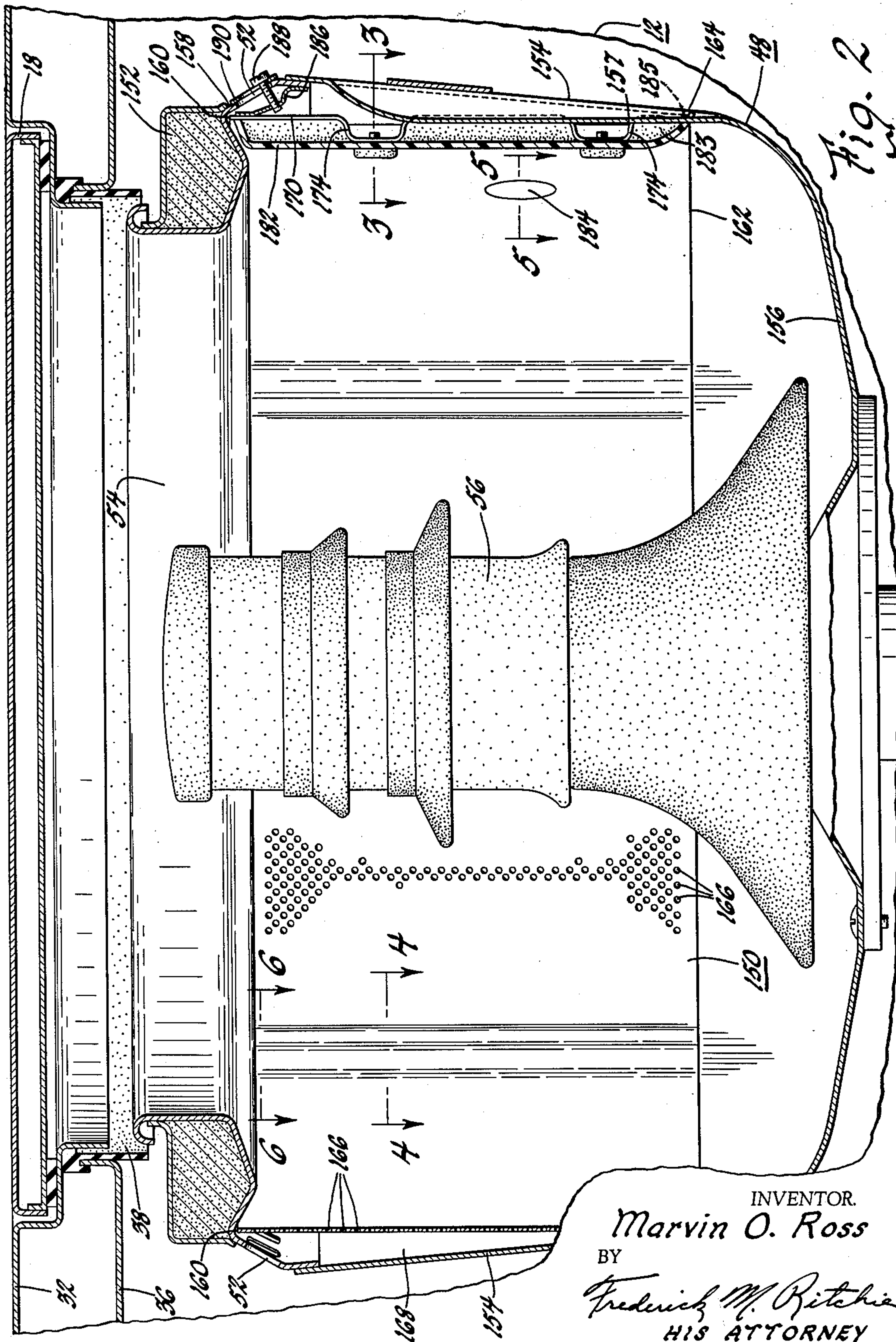
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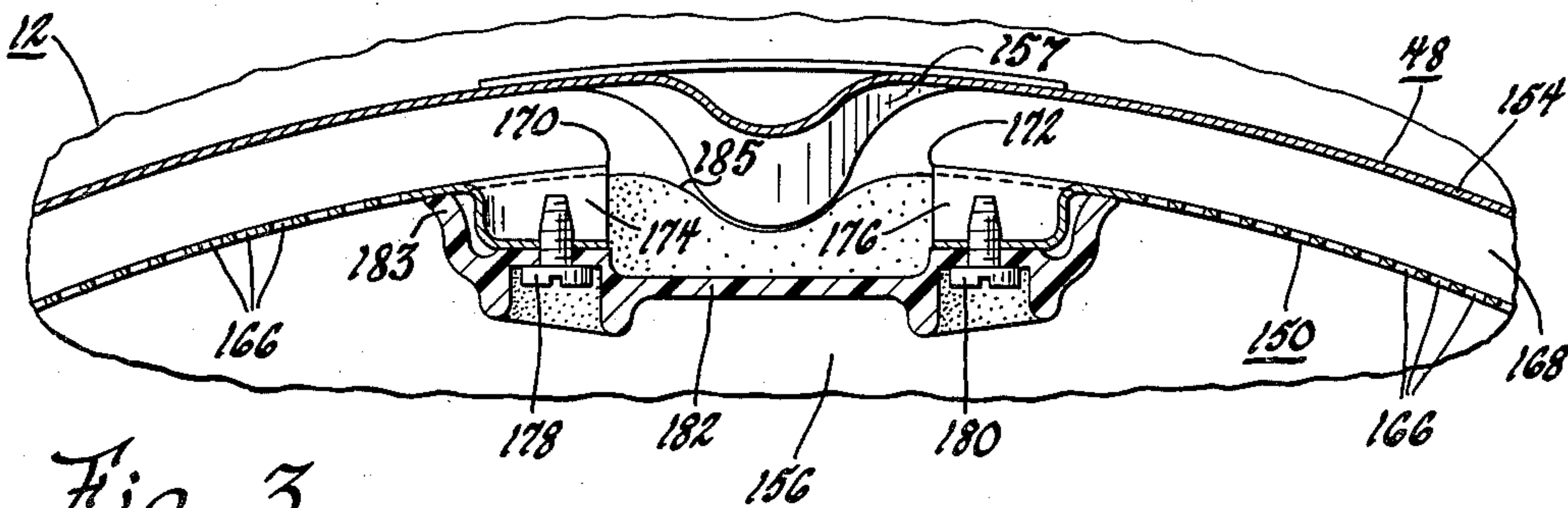


Fig. 3

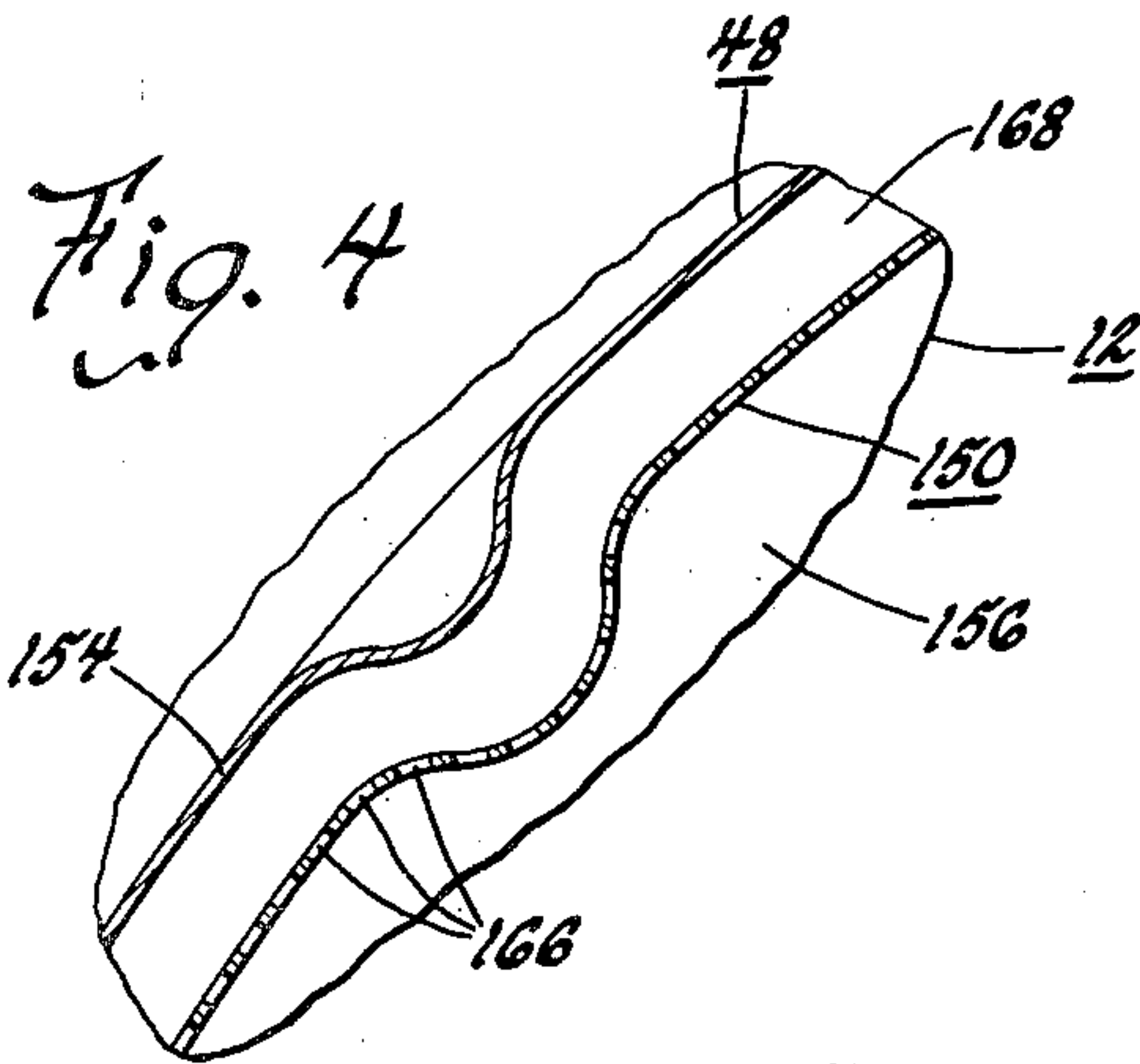


Fig. 4

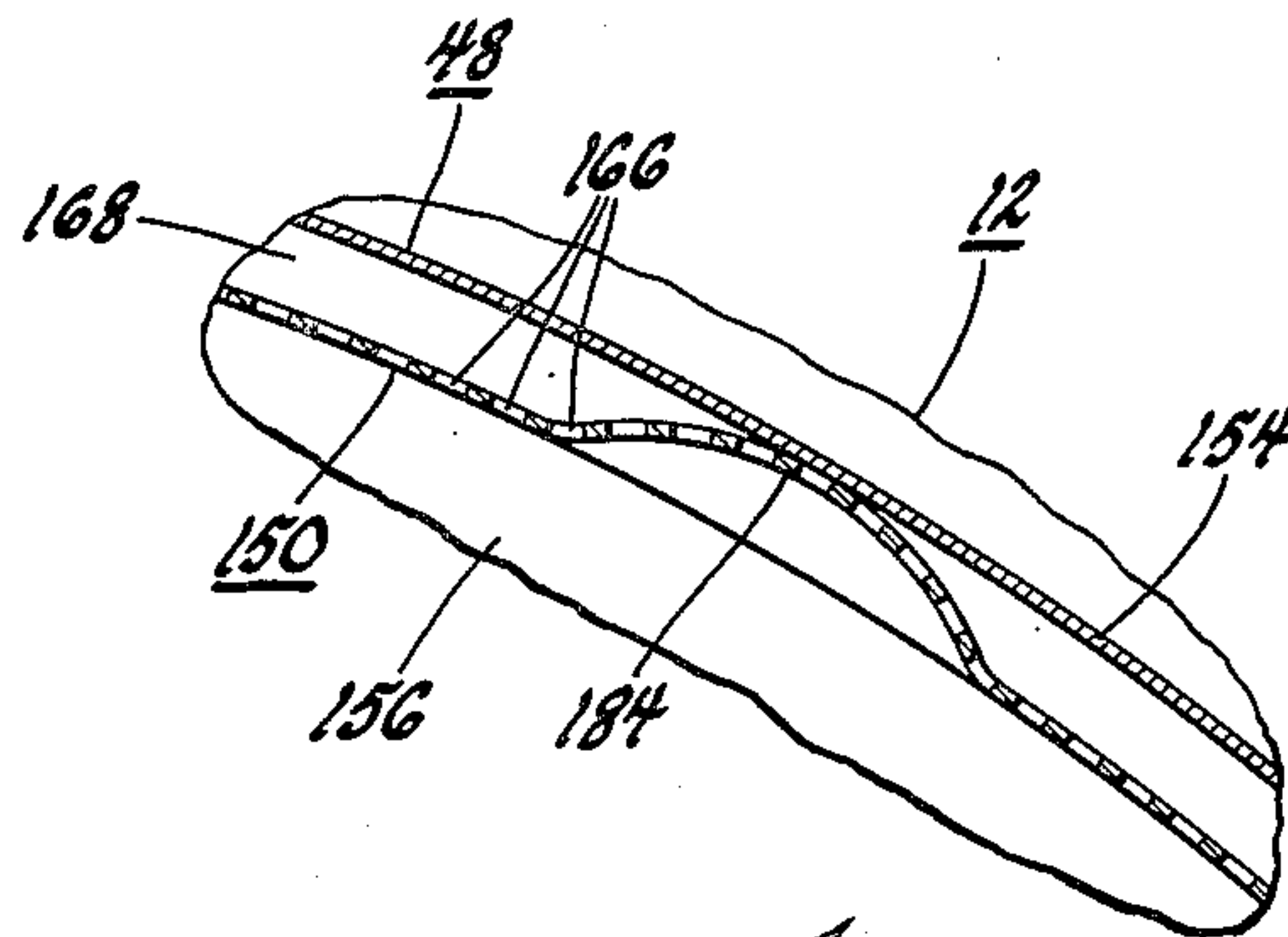


Fig. 5

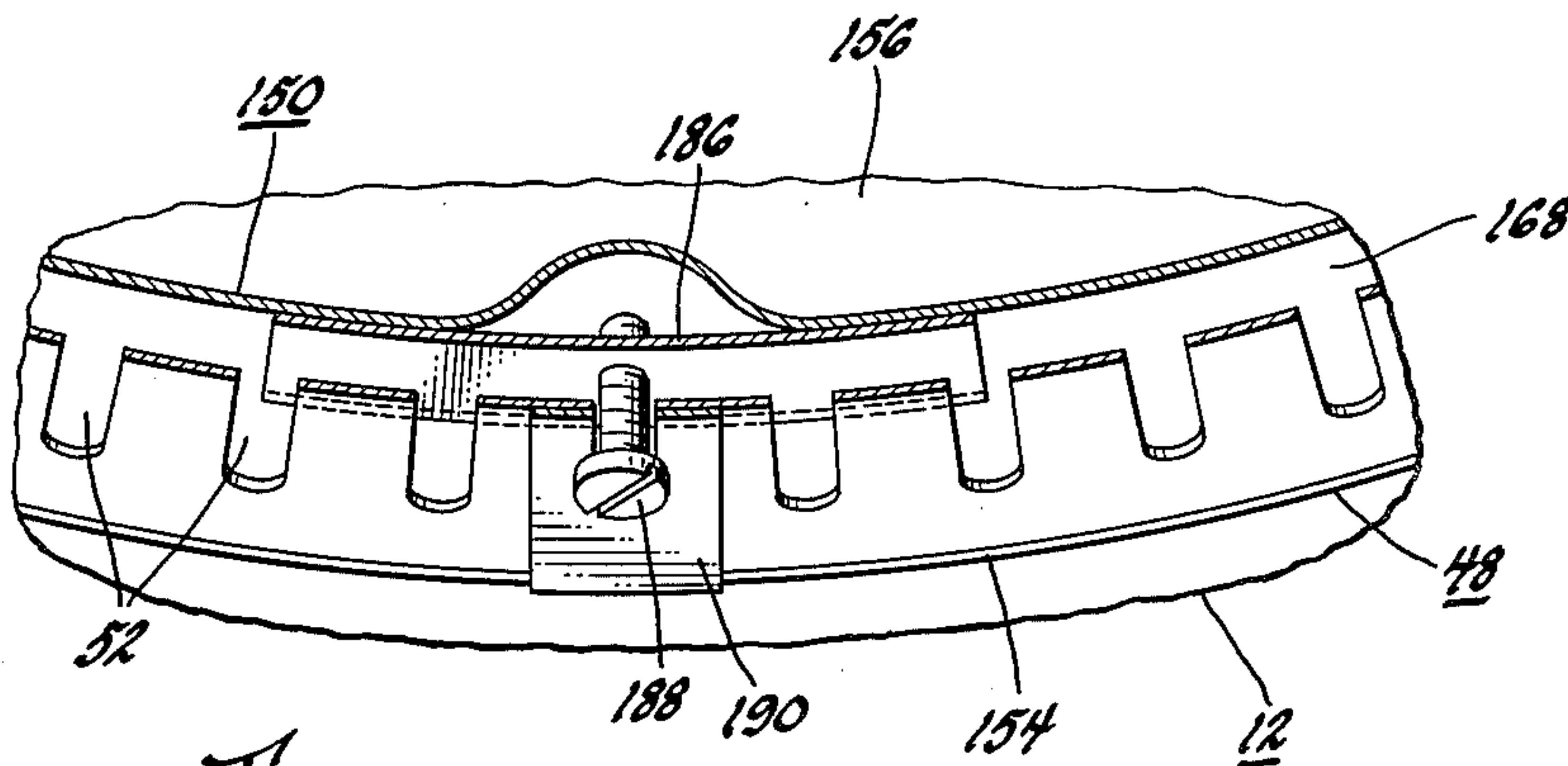


Fig. 6

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3,102,093

DRY CLEANING APPLIANCE

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1 Claim. (Cl. 210—382)

This invention relates to a dry cleaning apparatus and more particularly to an improved clothes guard for a substantially imperforate spin tub rotatable about a substantially vertical axis.

In self-service dry cleaning apparatus, solvent may be circulated between a dry cleaner spin tub and a filter area. The solvent is removed from the clothing and the spin tub by a centrifuging process wherein the solvent is thrown by centrifugal force from the rotating tub. In the course of repeated dry cleaning cycles, the solvent becomes more contaminated with soil removed from the clothing being cleaned. Since, in the prior art, the solvent strains itself through limited portions of the clothing on its way out of the spin tub, a streaking problem results. Accordingly, this invention solves the problem by positioning a perforated clothes retainer of about the same contour as the side wall of the spin tub in slightly spaced relationship from the tub to form a channel for the solvent substantially coextensive with the side of the tub. This permits the cleaning solution or solvent to leave the clothes uniformly via a large area of the perforated retainer rather than passing through limited portions of the clothes.

Accordingly, an object of this invention is the provision of a clothes guard for a spin tub in a dry cleaner.

A more specific object of this invention is the provision of a perforated, generally cylindrical sleeve which is spaced slightly from the side wall of the spin tub and coextensive therewith to form an annular chamber communicating with the outflow ports of a spin tub.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a sectional view, partly in elevation, of dry cleaning apparatus suitable for use with this invention;

FIGURE 2 is a fragmentary sectional view, partly in elevation, showing the spin tub with the clothes guard of this invention;

FIGURE 3 is a fragmentary sectional view taken along line 3—3 in FIGURE 2;

FIGURE 4 is a fragmentary sectional view taken along line 4—4 in FIGURE 2;

FIGURE 5 is a fragmentary sectional view taken along line 5—5 in FIGURE 2; and

FIGURE 6 is a fragmentary sectional view taken along line 6—6 in FIGURE 2.

In accordance with this invention and with reference to FIGURE 1, a self-service dry cleaning system is illustrated. The system includes an outer cabinet 10 for partially enclosing a clothes cleaning apparatus or cleaner 12 and a clothes drying apparatus or dryer 14. Note that the dryer 14 is elevated above the floor to provide for a filter compartment 16 therebelow. The clothes cleaner 12 has a top access door 18 which is pivotally openable for inserting and removing fabrics from the cleaner.

The clothes dryer 14 has a front access opening which faces the cleaner access opening 18 adjacent one side thereof. This arrangement places the respective access

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doors of the dryer and cleaner in a confined area defined by a top wall 26 and a side wall 28 of the dry cleaning cabinet 10, a perforate grille 30 at the rear of the confined space operating to withdraw fumes from the area whenever either access door is open. The vent grille 30 is connected to the atmosphere through a venting system at the rear of the cabinet as set forth more fully in the commonly assigned copending application Serial No. 105,733 to which reference may be had for greater detail regarding the dry cleaning apparatus.

More particularly, the cleaner 12 is shown comprised of an outer cabinet or casing 32 in the top wall of which is located the access door 18 hinged along a rear edge thereof. Within the cleaner cabinet 32 a generally cylindrical, imperforate, solvent container 34 is disposed which includes a subtop portion 36 having an access opening 38 in axial alignment with the top access lid 18. A bulkhead 40 closes the lower end of the solvent container 34 and includes a drain opening 46 in a lowermost portion thereof. A generally cylindrical spin tub 48 is rotatably supported by a resilient, inverted cup-like member 50 on the bulkhead 40 and includes a plurality of circumferentially arranged outflow ports 52 around an upper portion thereof. The tub 48 has a top access opening 54 which aligns with the lid opening and the subtop opening immediately above. Within the spin tub 48 an agitator 56 is adapted for vertical reciprocation. An agitating and spinning mechanism 58 driven by a motor 57 is adapted to vertically reciprocate the agitator 56 when operated in one manner and to rotate or spin the tub 48 when operated in another manner. By way of suggesting one suitable agitating and spinning mechanism 58, but not by way of limiting this invention, reference may be had to the patent to Clark 2,422,395, issued June 17, 1947.

The clothes dryer 14 is a conventional, single pass, air dryer substantially like that taught in the patent to Whyte 2,843,945, issued July 22, 1958. The dryer includes a horizontally rotatable tumbling drum 60 having a perforate rear wall 62 and a front access opening 64 in alignment with a dryer door (not shown) on the side of the dryer facing the cleaner 12. A drying heater 66 is disposed adjacent the perforate rear wall 62 of the tumbling drum and adapted to be energized for drying clothes within the tumbling drum. During operation of the heater 66 and rotation of the tumbling drum 60, air is circulated by a fan, shown generally at 68, driven by a motor 70 which may also be connected through a conventional pulley system for rotating the tumbling drum 60. Fan 68 is connected with access opening 64 by way of a front duct 72, said front duct being exhausted by the fan through an exhaust 74 connected behind the dry cleaning cabinet to the outside vent system or to a conventional solvent adsorber or reclaiming.

The circulating system for a dry cleaning fluid or solvent, such as perchloroethylene, will now be described. The main components of the circulating system include a sump 80 having a top wall 82 with an air vent and spill-over return 83. Above the sump top wall 82 is a pump 106. The pump has its inlet connected through a solvent suction dip tube 110 to the bottom of the sump 80. A filter assembly 116 is adapted to receive the output of the pump through a conduit 118 which connects to the inlet 120 of the filter. The filter casing 117 is positioned angularly in the filter compartment 16, such that a restricted gravity drain 122 extends through the sump wall 82 to substantially drain the filter casing of solvent when the dry cleaning system is shut down. At one end of the filter casing, an outlet fitting 124 connects by way of conduits 126 and 130 through a two-way valve 128 to the tub access opening 54, a terminal portion of the conduit 130 overlying the top of the tub. The valve 128 is con-

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trolled into a first position connecting the filter outlet 124 to the spin tub 48 and a second position connecting the filter outlet to a sump return line 134. Completing the circulating system is a conduit 136 which connects to the drain outlet 46 of the solvent container 34. This conduit 136 enters the sump by way of a button trap 138, access to which is gained through a removable lid 140 for cleaning the trap device as well as for adding additional solvent to the system. A sight glass 142, or other suitable means, may be used for providing a visual indication of the dry

The fluid circulation system operates as follows. The pump 106 draws dry cleaning fluid or solvent from the sump 80 through the dip tube 110. This dry cleaning fluid, cleaned of large objects by the trap 138, is forced through the conduit 118 to the filter 116. The filter is effective to filter small solids and solubles from the dry cleaning fluid. After an additional period during which the valve 128 returns the solvent to the sump and the solvent is recirculated to remove particulate matter from the filter, the valve is actuated to a position wherein the filtered dry cleaning fluid is discharged from the filter by way of the conduits 126 and 130 into the spin tub. When the level of the dry cleaning fluid within the tub reaches the outflow ports 52, the dry cleaning fluid will overflow into the solvent container 34 and return by gravity through the conduit 136 to the sump 80, the button trap 138 intercepting its flow to remove large objects from the fluid.

To operate the self-service dry cleaning equipment, one places clothes within the spin tub 48 and initiates the cycle. Once the solvent is pumped to the spin tub and the agitating and spinning mechanism 58 is operated to reciprocate the agitator 56, the solvent will be surged through the fabrics to remove the dirt and soil therefrom. Throughout the dry cleaning cycle, the solvent within the tub will become more contaminated. In the prior art devices when the mechanism 58 is energized to spin the tub 48, the clothing would lump into a toroidal or doughnut form generally blocking the outflow ports 52 of the tub. In this fashion, the solvent would be centrifuged from the clothing and the tub through the outflow ports with a limited portion of the clothes load serving as the final strainer of the solvent being centrifuged. This straining action causes streaking of the fabric in the area of the outflow ports and a generally unsatisfactory cleaning result.

In accordance with this invention and with reference to FIGURE 2, the spin tub 48 is provided with a clothes guard shown generally at 150. Note that the spin tub 48 is formed with a balance ring 152, the inner edge of which forms the access opening 54 to the tub interior. A generally vertical but somewhat outwardly tapered or bowed side wall 154 of the tub merges into a bottom wall 156 underlying the agitator and includes spaced inwardly directed strengthening ribs such as 157 (FIGURE 3). It is the purpose of this invention to provide a clothes guard 150 which snugly engages the upper terminus 158 of the tub side wall with its upper edge 160. Likewise, the lower edge 162 of the clothes guard snugly hugs the lower end 164 of the side wall. Perforations 166 completely cover the guard or sleeve and provide a myriad of exits for the solvent leaving the clothing on its way to the outflow ports 52. The clothes guard 150 is spaced from the side wall 154 to form an annular chamber 168 which provides a passageway interposed between the perforations 166 of the clothes guard and the outflow ports 52. In this fashion, the solvent being centrifuged from the clothing leaves the clothing over a large area through all of the many perforations 166, a fact which prevents the solvent from being strained through a limited area of clothing lumped in front of the outflow ports 52.

The clothes guard or retainer 150 is comprised of a generally rectangular, nylon coated sheet of perforated metal which has its terminal ends 170, 172 lying in juxtaposition when the clothes guard is wrapped into a cylindrical form

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and placed in the spin tub. Depressed notches 174, 176 are ported to receive fastening means, such as screws 178, 180, in a plastic spacer bracket 182 of acetal resin or equivalent which extends completely over the terminal portions of the clothes guard and includes a peripheral sidewall 183 which snugly hugs the guard to prevent by-passing of the solvent at this point, said peripheral sidewall having a reentry portion 185 partially enveloping the rib 157 (FIGURE 3).

With reference to FIGURES 4 and 5, the tub side wall is shown spaced generally uniformly, except at its upper and lower ends, from the perforated clothes guard 150. At spaced points about the periphery of the installed guard ring, a bulged-out portion 184 is provided to maintain the spacing of the clothes guard from the tub wall.

The guard 150 is attached to the spin tub 48 in the following manner and with reference to FIGURES 2 and 6. At spaced points about the upper edge 160 of the guard, a plurality of tabs 186 are fastened as by welding. These tabs 186 are perforated to receive a screw 188 which is retained in a bracket 190 on the outside of the spin tub. The screw 188 joins the brackets 190 and 186 by extending through one of the outflow ports 52. Thus, the clothes guard is retained on the side wall of the spin tub to form a channel from the bottom of the guard to the outflow ports. The perforated guard holds the clothing away from the outflow ports so that the solvent will move evenly or be centrifuged uniformly from the fabric as they lie along the guard. This arrangement prevents streaking and effects an improved dry cleaning result.

It should now be seen that an improved spin tub for a vertical tub dry cleaning apparatus has been provided which prevents streaking of the clothes by maintaining an unobstructed path for the solvent to be centrifuged from the spin tub and the clothing.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

In combination, a spin basket having a container portion and means forming an access opening smaller than said container portion, said container portion being defined by a bottom wall means and a radially outwardly bowed generally vertical container sidewall having an inwardly directed rib, said container sidewall having a plurality of outflow ports circumferentially arranged around an upper portion thereof, means for rotating said spin basket in a centrifuging operation, and a clothes guard spaced from said container sidewall and coextensive therewith to form an annular chamber communicating with said outflow ports, said clothes guard comprising a generally cylindrical, perforated metallic sheet having juxtaposed coextensive terminal portions on opposite sides of said rib and having upper and lower edges, said upper edge engaging said container sidewall above said outflow ports and said lower edge engaging said container sidewall below said outflow ports, said terminal portions including juxtaposed radially inwardly depressed notches, an elongated, plastic spacer bracket fitting completely over said terminal portions, means for fastening said spacer bracket to said terminal portions at each of said notches in a manner to hold said terminal portions in fixed relationship to each other, said spacer bracket including a peripheral sidewall portion outboard of said notches snugly engaging said metallic sheet to prevent by-passing of solvent at this point, said peripheral sidewall portion of said bracket having a reentry portion at one end thereof partially enveloping said rib in a manner to locate said clothes guard relative to said spin basket, and means including a tab fastened to said clothes guard at one end thereof and engaging said container sidewall at the other end thereof to space the upper edge of said clothes guard from said container sidewall in the vicinity of said outflow ports and a bolt extending through one of said outflow ports into en-

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gagement with said tab to secure said clothes guard in said
spin basket.

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