Jan. 2, 1951 K. M. HAMMELL 2,536,930

GARBAGE DISPOSAL APPARATUS

Filed Aug. 22, 1946 3 Sheets-Sheet 1

FIG. 2

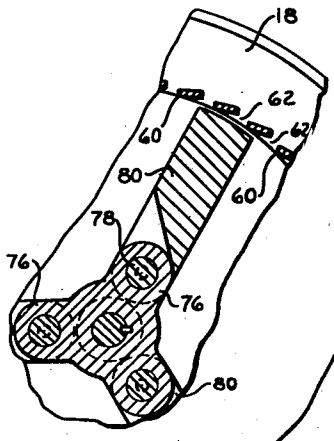


FIG. 1

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FIG-5

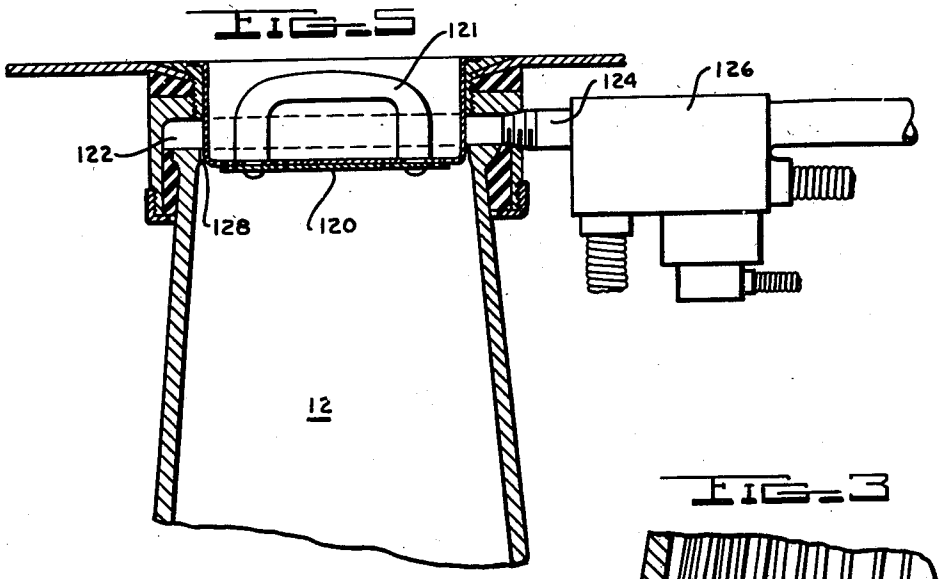


FIG-3

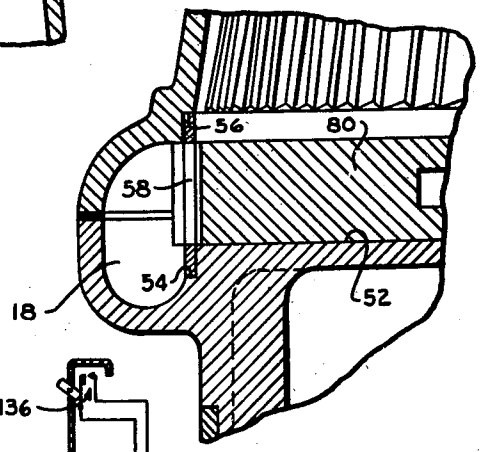
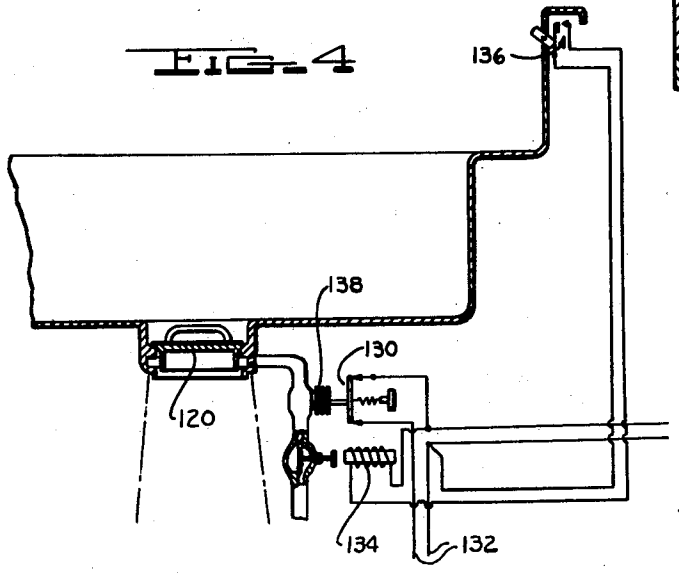


FIG-4



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GARBAGE DISPOSAL APPARATUS

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FIG. 6

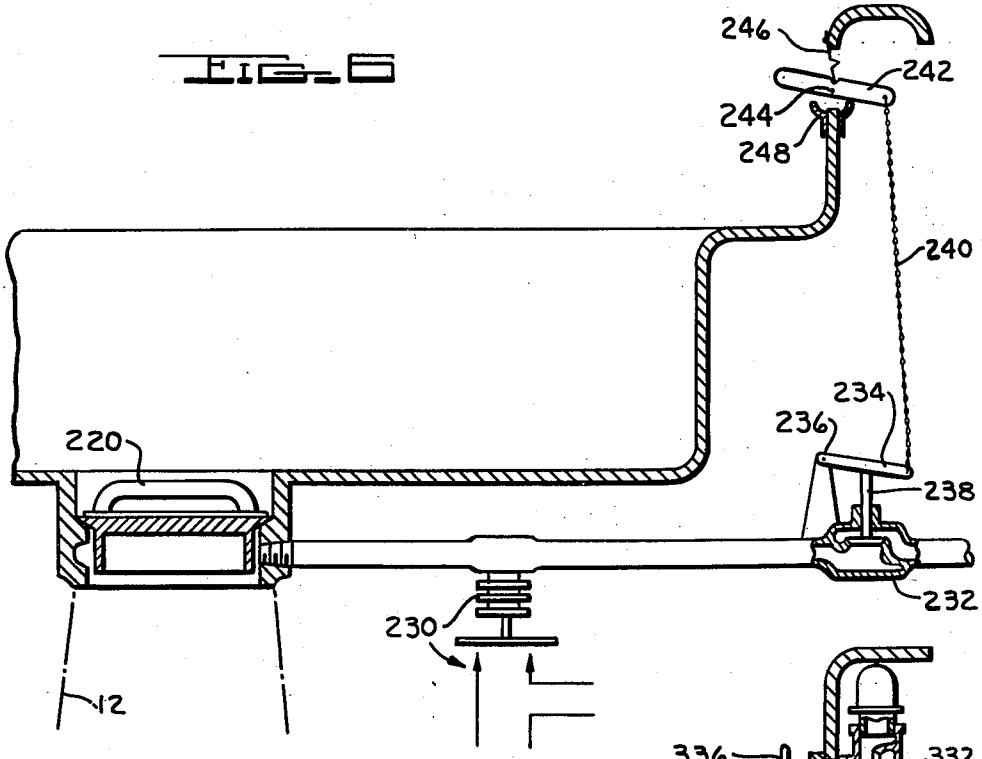
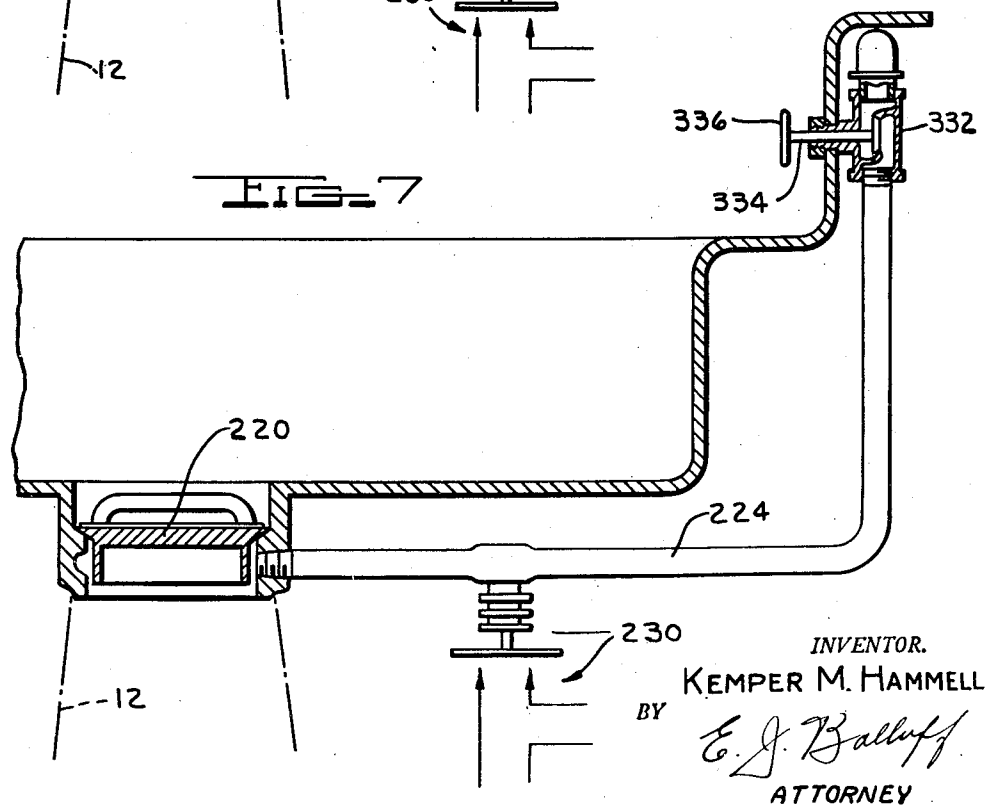


FIG. 7



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UNITED STATES PATENT OFFICE

2,536,930

GARBAGE DISPOSAL APPARATUS

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Application August 22, 1946, Serial No. 692,185

4 Claims. (Cl. 4—187)

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This invention relates to garbage disposal apparatus and has particular reference to a means adapted to be associated with a drain outlet from a sink for reducing garbage and the like in order that the same may be conveniently disposed of.

Principal objects of the invention are to provide:

A new and improved garbage disposal apparatus;

A new and improved control arrangement therefor by means of which water will be supplied to the reducing apparatus during the operation thereof.

Other and further objects of the invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings, of which there are two sheets, which, by way of illustration, show preferred embodiments and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims. I also contemplate that of the several different features of my invention, certain ones thereof may be advantageously employed in some applications separate and apart from the remainder of the features.

In the drawings

Fig. 1 is a fragmentary vertical sectional view of a garbage disposal apparatus embodying the invention;

Fig. 2 is a fragmentary sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view of the reducing means shown in Fig. 1;

Fig. 4 is a schematic view illustrating a modified form of the apparatus;

Fig. 5 is an enlarged fragmentary diagrammatic view of part of the apparatus illustrated in Fig. 4;

Fig. 6 is a schematic view illustrating a modified form of the invention; and

Fig. 7 is a schematic view illustrating a further modified form of the invention.

The invention contemplates a disposal apparatus which is constructed and arranged for grinding or reducing garbage so that the same may be carried away by the conventional drain system of a sink. The apparatus as illustrated is associated with a sink 10 and includes a hopper or chamber 12 for collecting the refuse material and feeding it to a grinding or reducing means indicated generally at 14, which, as illustrated, is arranged to be driven by an electric motor 16. A trough 18 in the form of a scroll is provided for collecting the reduced material and such trough is adapted to be connected through a spout 20 to the usual drainage system for conducting away the reduced material.

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The chamber 12 is formed in part by a frustoconical casting 22, the interior of which is formed to provide a series of vertically extending cutting teeth 24.

The upper end of the casting is provided with a marginal flange 26 against which an annular gasket 28 of resilient material is seated, such gasket being held by a ring 30 which is threaded on a collar 32. The collar 32 is threaded onto a ring 34 which defines the throat of the sink drain outlet, such ring 34 at its upper end having a flange which seats on the rim of the opening provided in the bottom wall of the sink.

A gasket 36 is clamped between the edge of the opening in the bottom of the sink and the collar 32. The interior of the ring 34 is provided with a shoulder 35 which forms a seat for a valve and closure 38 having a handle 40. The valve 38 is constructed and arranged so that one part thereof may be turned relative to another part thereof by means of the handle 40 in order to close the drain through the ring 34 or to permit water to flow through suitable perforations in the valve 38 into the chamber 12. The valve 38 is removable from the ring 34 in order to permit material to be reduced to be fed into the chamber 12.

A baffle 42 may be secured to the lower end of the ring 34 and arranged so as to deflect material which is fed into the chamber 12 to one side thereof. The baffle 42 is removable and will function when arranged as illustrated to prevent the insertion of a person's hand into the chamber 12.

A latch 44 arranged to be released by a lever 46 may be provided on the underside of the baffle 42 for releasably securing the same in position.

The lower end of the casting 22 is formed to seat upon a casting 50 and cooperate therewith to define the trough 18. The lower end of the casting 22 and the upper end of the casting 50 have complementarily formed surfaces between which a gasket may be inserted and a series of bolts extending through openings in the casting and having nuts secured to the threaded ends thereof may be provided for rigidly bolting the castings 50 and 22 together. The casting has a substantially flat surface 52 which forms the bottom wall of the chamber 12.

The rim of the surface 52 is formed to provide an annular seat 54 (Fig. 3) which cooperates with an oppositely arranged annular seat 56 formed in the casting 22 below the teeth 24 thereof to support and locate a shredding ring 58. The ring 58 is formed to provide a series of vertically extending teeth 60 projecting upwardly from the bottom wall 52 of the chamber 12 around the periphery thereof. The ring 58 may be formed from a strip of suitable material, the ends of which are joined together and is secured in position on the seats 54 and 56.

Slots 62 between the teeth 60 are of such length and width so that the garbage or other material to be reduced is reduced to the proper size before passing from the chamber 12 into the trough 18. It is desirable to reduce the material to a sufficiently fine state that it may be flushed by the water flowing through the apparatus down the drain to which the trough 18 is connected by the spout 20.

The casting 50 at the center thereof is formed to provide support for a bearing 70 through and above which extends a continuation 72 of the shaft of the motor 16. A hub 74 is fixed to that part of the shaft 72 which extends above the surface 52 and this hub is provided with a plurality of radially extending arms 76. Each arm carries a pin 78 to which a swinging hammer or impeller 80 is connected, the pins 78 projecting from both sides of the arms 76 and extending into suitable openings formed in bifurcated ends of the impeller 80. The impellers 80 are thus free to swing about the pins 78 as a pivot. A plate 82 provided with holes for receiving reduced ends of the pins 78 overlies the hub 74 and its arms and a nut 84 threaded on a threaded end of the shaft 72 retains the parts in their assembled relationship.

During operation of the motor which may rotate at a speed of 1600 R. P. M., the centrifugal force of the mass of the impellers 80 tends to hold the same in a radial position where they are operative to move or impel the material in the bottom of the chamber 12 against the shredding teeth 60. The material lying between the impellers 80 will be brought into contact with the teeth 60 while that material above will be brought into contact with the teeth 24.

The teeth 60 and 24 during operation of the impellers will produce a shredding or reducing action on the material in the chamber 12. The impellers 80 are of such length that in their extended position they will clear the teeth 60 by a slight amount, say for example, one-sixteenth of an inch. The hub 74, the impellers 80 and the driving means therefor form a means for rotating or turning the mass of material in the chamber 12 in order that the teeth 24 and 60 may produce a reducing action thereon. Since each impeller 80 is free to pivot about its securing pin 78, it is free to swing back about such pivot, that is, in a counterclockwise direction about such pivot, if it should encounter an obstruction such as might be caused by a bone temporarily lodging against one of the teeth in the bottom of the chamber 12. When the material is reduced sufficiently to pass through slots 62, such material will be discharged into the trough 18. Water should be continuously supplied to the apparatus during the operation thereof so as to aid in carrying the reduced material into the trough 18 and down the drain. The impellers 80 act as rotary impellers for directing material through the slot 62.

The sink 10 is provided with the usual cold water supply, including the faucet 100 and cold water valve control or handle 102. Means are provided to insure the supplying of water to the apparatus during the operation thereof and which comprise the following: A conventional rotary electric switch 104 may be provided in the current line 106 to the motor 16 for controlling the supply of current thereto and an operating knob 108 connected by a shaft 110 to the mechanism of the switch 104 is provided for turning the switch 104 off and on. The switch 104 is of the type in which rotary movement in one direction turns the switch on and rotary movement in the opposite direction turns the switch off. The rod 110 has a drum 112 connected thereto to rotate therewith. A chain 114 has one of its ends connected to the drum 112 and its other end connected to a drum 116 which is connected to the shaft of the cold water control 102 so as to turn therewith during opening and closing movement of the valve controlled by the lever 102.

Assuming that the switch 104 is open, rotation of the knob 108 in the direction of the arrow 118 will turn the switch 104 on to close the motor circuit. This rotation will also serve to wind the chain 114 on the drum 112. Since the other end of the chain is connected to the drum 116, such movement of the knob 108 will move the control 102 so as to open the cold water valve, thereby permitting flow of water through the faucet 100 into the sink from which it can drain into the chamber 12, if the valve 38 is open or removed. The chain 114 permits the control 102 for the cold water to be opened without turning on the switch 104. However, if the switch 104 is closed, the water valve must be open and closing movement of such valve control 102 will through the chain 114 serve to impart motion to the rod 110 for opening the switch 104.

The reducing means is disclosed and claimed in my prior copending application, Serial No. 524,836, filed March 1, 1944, for Garbage Disposal Apparatus, of which the present application is a continuation-in-part.

In the embodiment illustrated in Figs. 4 and 5, a modified control arrangement is illustrated. In this modification, the inlet to the chamber 12 is adapted to be closed by a removable cup-shaped stopper 120, having a handle 121. When the stopper 120 is removed, water is free to flow into the chamber 12 from an annular passage 122, water being supplied thereto by a cold water line 124 under the control of a solenoid controlled water valve 126. When the stopper 120 is arranged in the position illustrated in Fig. 5, there is a slight annular clearance or passage 128 between the outside of the stopper 120 and the inlet neck of the chamber 12. This passage 128 will permit water to flow from the passage 122 into the chamber 12, but is of such size so as to set up sufficient back pressure or resistance to flow of the water so as to actuate a pressure actuated double contact switch 130 (Fig. 4) which controls the supply of current to the motor through the line 132. The water valve 126 as illustrated is of the self closing type and is adapted to be opened upon energization of the solenoid 134, the energization of which is controlled by a manually operated switch 136. Thus closing of the switch 136 will energize the solenoid 134 which will thereupon open the water valve 126, thereby permitting flow of water to the chamber 12. When the stopper 120 is arranged

in the position illustrated in Figs. 4 and 5, back pressure in the water line will actuate the bellows 138 of the pressure actuated switch 130 to close the same, thereby closing the circuit to the motor which is connected to the lines 132. With this arrangement, the disposal apparatus may be operated only when the stopper 120 is obstructing the inlet to the chamber 12. Removal of the stopper 120 will eliminate the back pressure of the water on the bellows, thereby permitting the switch 130 to open, as a consequence of which the motor circuit will be de-energized. With the stopper 120 in position, the motor circuit may be controlled by the manually operated switch 136.

In the modification illustrated in Fig. 6, water is supplied to the chamber 12 by a water line 224 in a manner similar to that illustrated in Figs. 4 and 5, and a stopper 220 when positioned so as to obstruct the opening between the sink and the chamber 12 as illustrated is adapted to create sufficient back pressure in the water line 224 so as to actuate the pressure actuated double contact switch 230 like the switch 130. The pressure actuated double contact switch 230 controls the circuit of the motor of the garbage grinder apparatus. With respect to the foregoing the modification illustrated in Fig. 6 is exactly like that illustrated in Figs. 4 and 5. However, the valve 232 which controls the flow of water through the line 224 to the garbage grinder is manually actuated, whereas in Fig. 4 the water valve is manually controlled but electrically actuated. The valve 232, like the valve 126, is of the self closing type.

A lever 234 pivoted at 236 is connected to the projecting end of the valve stem 238. A chain 240 is connected at one end to one end of the lever 234 and at its other end to one end of a lever or operator 242. The operator 242 is pivoted at 244 and is movable about the pivot 244 in a counterclockwise direction so as to open the valve 232. A spring 246 cooperates with the lever 242 to position it either in the position as illustrated or in its other position in which it holds the valve 232 open.

By depressing the front end of the lever 242 the valve 232 may be opened and the spring 246 will hold the lever 242 in such position so as to hold the valve 232 open. A stop 248 is positioned so as to engage the lever 242 so as to determine its other position, that is, the position of the lever 242 with the valve 232 open.

Upon restoring the lever 242 to the position shown, the valve 232 will automatically close due to the pressure of the water in the line 224. When the valve 232 is open, water will flow through the line 224 into the garbage grinder and if the stopper or closure 220 is positioned as illustrated, the back pressure created thereby in the line 224 will operate to close the switch 230 so as to close the motor circuit. Removal of the stopper 220 from its obstructing position at the inlet to the chamber 12 will permit the switch 230 to open, which is its normal position.

In the modification illustrated in Fig. 7, the construction is the same as that in Fig. 6 except that the water valve 332 is of the type in which the valve member is mounted on one end of a threaded stem 334 which is rotated by means of a handle 336 between its closed and open positions. As shown, the valve 332 is closed but by rotating the stem 334 by means of the handle 336 the valve 332 may be opened so as to permit

the flow of water to the garbage grinder and closing of the switch 230.

While I have illustrated and described preferred embodiments of my invention, it is understood that these are capable of modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. Garbage disposal apparatus comprising a chamber having an inlet at its upper end through which water and garbage may be supplied to said chamber and an electric motor operated means for reducing garbage in said chamber, a water supply for supplying water to said chamber through said inlet including a manually operated valve for opening and shutting off said supply of cold water, an electric circuit for said electric motor, including a manually operated switch for opening and closing said circuit, a mechanical interlock between said switch and valve operative to open said valve upon closing said switch, and removable perforate means in said inlet obstructing the escape of garbage through said inlet from said chamber during operation of said reducing means, said means providing for the entry of water through said inlet into said chamber and onto the top of the garbage being reduced therein.

2. Garbage disposal apparatus comprising a chamber having electric motor operated means associated therewith for reducing the garbage, a water supply to said chamber including a manually operated valve for opening and shutting off said supply of water, an electric circuit for said electric motor, including a manually operated switch for opening and closing said circuit, and a mechanical interlock between said switch and valve operative to open said valve upon closing said switch and to open said switch upon closing of said valve, said interlock including a lost motion connection between said switch and valve which permits manual operation of said valve when said switch is open without operation of said switch.

3. Garbage disposal apparatus comprising a sink having a drain outlet, a chamber having electric motor operated means associated therewith for reducing garbage fed to said chamber through said sink drain outlet, a water supply for said sink, a manually operated valve for opening and shutting off said water supply, an electric circuit for said motor including a switch for opening and closing said circuit, a switch operating member operable for opening and closing said switch, and a lost motion connection between said switch operating member and said valve operable for opening said valve upon actuation of said switch actuating member to close said switch and to open said switch upon closing movement of said valve, said connection being constructed and arranged so as to permit opening and closing of said valve when said switch operating member is in a position with said switch open without closing of said switch.

4. Garbage disposal apparatus comprising a sink having a drain outlet, a chamber communicating with said sink outlet and having electric motor operated means for reducing garbage, a cold water supply for said sink including a valve for opening and shutting off said supply of cold water, an electric circuit for said electric motor, including a switch for opening and closing said circuit, a single means located upon a back por-

tion of said sink for operating said valve and switch, and valve means associated with said sink outlet for controlling the flow of water from said sink to said chamber.

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

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