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71. SOLICITANTE

ARCH CHEMICALS, INC.

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74. APODERADO

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1

SOLICITUD DE:



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Patente de Modelo de Utilidad.



Capítulo I.



Capítulo II.

2

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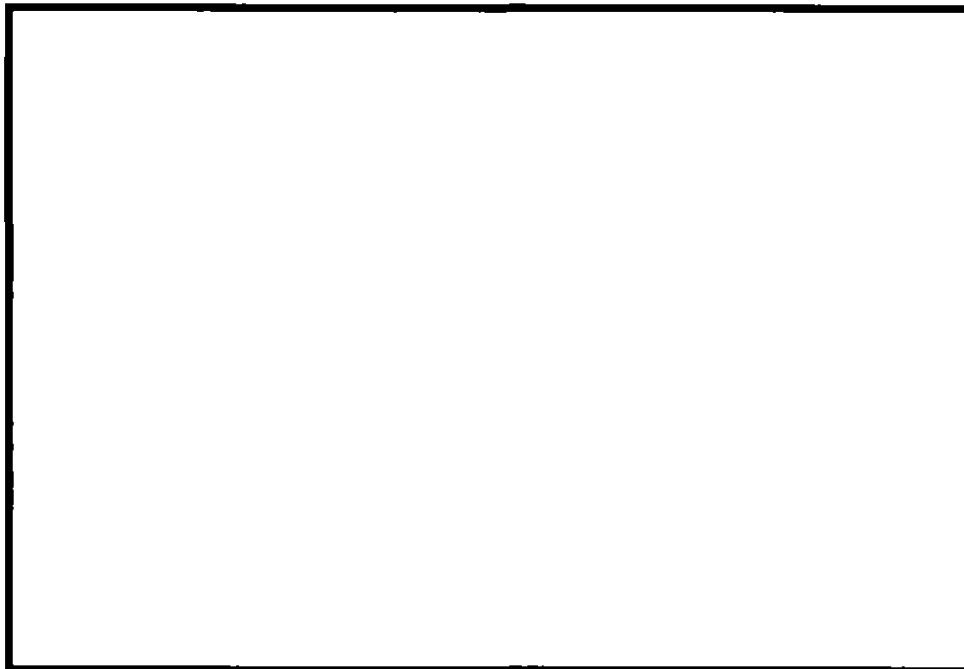
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ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$422.000
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. Fotocopia autenticada
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☒ Otros Tarjeta de propietarios.

11 FIGURA CARACTERÍSTICA:



12. Solicito la concesión de la patente:

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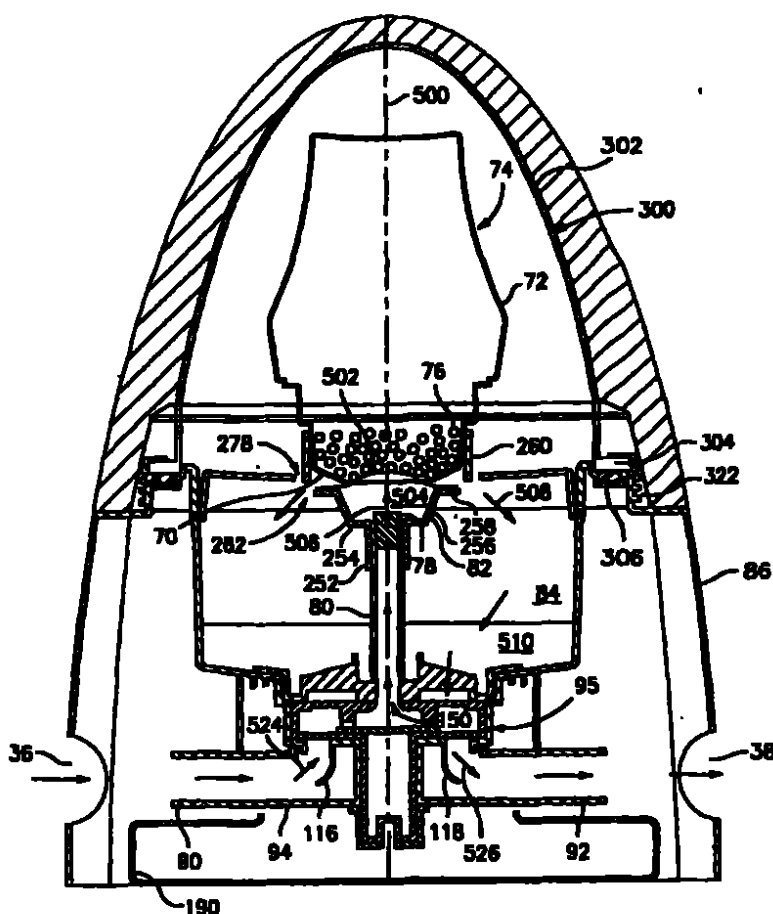
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[Continued on next page]

(54) Title: CHEMICAL FEEDER



(57) Abstract: A feeder device for introducing a chemical into a flow of water includes a feeder inlet (36) and a feeder outlet (38), a reservoir (74) of the chemical in solid form and having a foraminous lower portion (70), a first conduit (80) having an outlet (78) and in communication with the feeder inlet (36) in at least a first feeder condition, a wall (82) surrounding the conduit outlet (78) and extending upward thereof, and an outlet chamber (84) receiving overflow containing the dissolved chemical and in communication with the feeder outlet.

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✓
S**CHEMICAL FEEDER****BACKGROUND OF THE INVENTION****(1) Field of the Invention**

5 This invention relates to water treatment, and more particularly to feeders for introducing treatment chemicals into a recirculating water stream from a swimming pool or the like.

(2) Brief Description of the Art

10 If untreated, swimming pool water provides an hospitable forum for the growth of bacteria, algae, and other undesirable and potentially unhealthful organisms. It, accordingly, has become common practice to treat pool water on both periodic and continuous bases with treatment chemicals to kill/control such organisms.

15 Such treatment is typically undertaken via the introduction of chlorine into the pool water at levels effective to kill or control the unwanted organisms. The chlorine source may be in liquid form or may be in a solid form which is then dissolved in the pool water. Among solid sources of chlorine are calcium hypochlorite (cal hypo), dichloroisocyanuric acid (dichlor), and trichloroisocyanuric acid (trichlor).

20 A variety of feeders exist to deliver chlorine from solid chemical tablets and the like. It is known to utilize a floating erosion dispenser, also known as a "floater" or "feeder", to provide a continuous release of the chemical. The floater contains the solid chemical and provides a controlled exposure of the chemical to the pool water which in turn controls the speed with which the water erodes the solid chemical to introduce chlorine to the pool water. Exemplary floaters are disclosed in U.S. Patent No. 4,917,868 and U.S. Design Patent Nos. 297,857 and 309,493. It is also known to pump pool water
25 through an external feeder which may be incorporated in a circulation system that also provides filtering of the pool water. Among such systems are intermittent spray systems, erosion systems, and partial periodic immersion systems. Examples of such systems are shown in U.S. Patent Nos. 5,932,093, 5,928,608, 5,441,711, 5,427,748, 5,419,355, 5,384,102, 5,133,381, and 4,208,376, and U.S. Reissue Patent No. 33,861. As additional
30 background, U.S. Patent Nos. 5,112,521 and 5,004,549 disclose various solid calcium hypochlorite compositions.

Obtaining proper dissolution of the treatment chemical and avoiding undesirable deposits or residues have posed problems in feeder design. Particular problems exist with the use of commercial calcium hypochlorite pellets which produce calcium carbonate deposits. See e.g., U.S. Patent No. 6,045,706.

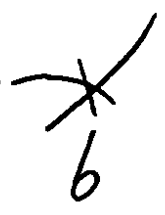
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BRIEF SUMMARY OF THE INVENTION

One aspect of the present invention is directed to a feeder device for introducing a chemical into a flow of water comprising: a feeder inlet and a feeder outlet; a reservoir of the chemical in solid form and having a foraminate lower portion; a first conduit having an outlet and in communication with the feeder inlet in at least a first feeder condition, maintaining a body of water in which said conduit outlet is immersed; and an outlet chamber which in at least said first feeder condition receives overflow containing the dissolved chemical from the body and is in communication with the feeder outlet.

Another aspect of the present invention is directed to a feeder device for introducing a chemical into a flow of water comprising: a feeder inlet and a feeder outlet; a reservoir of the chemical in solid form and having a foraminate lower portion; a first conduit having an outlet and in communication with the feeder inlet in at least a first feeder condition; means for maintaining a body of water in which said conduit outlet is immersed in at least said first feeder condition; means for altering flow through the conduit to locally elevate a surface of said body between: a first level in said first feeder condition in which the body contacts the chemical in the reservoir so as to dissolve such chemical; a second level in a second feeder condition in which the body does not contact the chemical in the reservoir; and means for, in at least said first feeder condition, directing flow containing the dissolved chemical from the body to the feeder outlet.

Still another aspect of the present invention is directed to a device for introducing chlorine from a chlorine-containing pool treatment chemical into a flow of water to/from a swimming pool comprising: a feeder inlet receiving water from the flow; a reservoir of the chemical in solid form and having a foraminate lower portion; a first conduit having an outlet and in communication with the feeder inlet in at least a first feeder condition; a wall surrounding the conduit outlet and extending upward thereof and, in at least said first feeder condition, maintains a body of water in which said conduit outlet is immersed, the



first conduit in said first feeder condition discharging water through the conduit outlet at a rate and speed effective to locally elevate a first surface portion of the body by a height of between 0.125 inch and 1.0 inch above another surface portion of the body so that the first surface portion contacts the chemical to dissolve the chemical; an outlet chamber which in at least said first feeder condition receives said dissolved chemical; and a feeder outlet returning said dissolved chemical to the flow.

And still another aspect of the present invention is directed to a method for introducing a treatment chemical into a body of water at a controlled rate comprising the acts of: providing a feeder having an inlet, an outlet, and containing a solid chemical in a chemical reservoir; causing a flow of water from the body to enter the feeder through the inlet and exit through the outlet to return to the body so as to run the feeder in at least a steady state first condition wherein: at least a first portion of the flow is directed through a conduit outlet into a first body of water so as to produce at least one local elevation of a portion of a surface of that first body, the local elevation contacting a foraminant lower portion of a reservoir of said treatment chemical in solid form so as to dissolve said treatment chemical; and said dissolved treatment chemical is directed to said outlet; and restricting at least said first flow portion so as to disengage the first body of water from the reservoir and cause the feeder to enter at least a steady state second condition.

And yet another aspect of the present invention is directed to a chemical container in a condition installed on a receptacle of a chemical feeder and, comprising: said chemical, comprising in major part calcium hypochlorite; a molded plastic body containing the chemical and having: an open lower end; a closed upper end; and an externally-threaded portion proximate the lower end in threaded engagement to a complementary internally-threaded portion of the receptacle; and a foraminant cover extending across the container mouth and at least partially supporting the chemical and having a central portion immersed in a locally elevated central portion of a body of water.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of an exemplary pool circulation system.

FIG 2 is a partial semi-schematic sectional view of a chlorinating section of a feeder.

FIG 3 is a front view of a feeder.

FIG 4 is a side view of the feeder of FIG 3.

5 FIG 5 is a vertical sectional view of the feeder of FIG 4.

FIGS. 6 and 7 are views of a manifold of the feeder of FIG 3.

FIG 8 is a view of an underside of a base of the feeder of FIG 3.

FIG 9 is a view of a valve element of the feeder of FIG 3.

FIG 10 is an exploded view of the valve element of FIG 9.

10 FIG 11 is a view of a discharge chamber in the base of the feeder of FIG 3.

FIG 12 is a view of the underside of the feeder of FIG 3.

FIG 13 is a view of the outlet chamber of the feeder of FIG 3.

FIG 14 is an exploded view of a portion of the feeder of FIG 3.

FIG 15 is a view of the underside of a cover for the base of the feeder of FIG 3.

15 FIG 16 is an exploded view of a treatment chemical container for the feeder of FIG 3.

FIG 17 is an exploded view of the feeder of FIG 3.

FIG 18 is a view of an alternate valve element lower flange.

20 FIGS. 19 and 20 are views of an alternate valve element including the lower flange of FIG 18.

FIG 21 is a partially exploded view of a conduit assembly for use with the valve element of FIGS. 19 and 20.

FIG 22 is a diagram of an alternate exemplary pool circulation system.

FIG 23 is a view of an underside of a base of an alternate feeder.

25 FIGS. 24 and 25 are views of first and second manifolds useful in the circulation system of FIG 22.

FIGS. 26 and 27 are views of the manifolds of FIGS. 24 and 25.

Like reference numbers and designations in the various drawings indicate like elements.

DETAILED DESCRIPTION

FIG 1 shows a pool 20 containing a body 22 of pool water and associated with a circulation system 24. The exemplary pool is of the above-ground type although this should not be regarded as limiting. The circulation system has a pool outlet conduit 26 drawing water from the pool and a pool return conduit 28 returning water to the pool. Flow through these conduits is induced by a pump 30 with a low pressure (suction) side toward the pool outlet conduit and a high pressure side toward the pool return conduit. Downstream of the pump, there may be a system filter 32 filtering debris and the like from water flowing from the pump and a feeder or chlorinator 34 introducing chlorine to the flow. The feeder has an inlet and an outlet respectively shown as 36 and 38. Alternatively, a manifold may be used in line instead of feeder 34. In that case, a feeder or chlorinator 34 would be connected to the manifold in an off-line fashion.

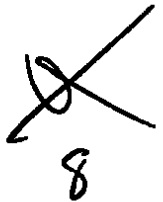
FIG 2 semischematically shows an example of certain aspects of the inventive feeders. Within a feeder, a solid water treatment chemical 40 is contained within a reservoir 42 having a foraminate lower portion 44. The reservoir is above a wall structure or portion thereof 46 which contains a body of water 48. The water enters the body 48 through a conduit 50 having an outlet or nozzle 52. The outlet or nozzle 52 is immersed in the body 48. The outlet 52 is sized so that the water 54 flowing therethrough has a velocity sufficient to produce a substantial local elevation or central stationary wave 56 in the surface of the water in the body. The elevation or stationary wave 56 is high enough to penetrate the foraminate portion 44 and contact the chemical 40. This contact permits dissolving of the chemical which enters the body 48.

Advantageously, a peripheral portion 58 of the surface of the body is at a substantially lower level than the elevation 56, a level below the foraminate portion 44. The level of portion 58 may be slightly above the level of a rim of the wall structure 46 or of discrete drain apertures therein because of surface tension of the body of water. Overflow 60 from the body is over such a rim or through such drain apertures and may be into a second body 62 contained, for example, by a wall structure 64 surrounding the conduit 50. A drain aperture 66 may pass a drain flow 68 of water containing dissolved chemical which, in turn, may be directed to a feeder outlet or may itself form the feeder outlet. The drain aperture is advantageously located proximate the lowest portion of the second body of water 62 to permit substantially full draining of such body.

When the feeder is turned off (such as via blocking flow through the conduit 50), the wall structure 46 may, subject to evaporation, retain the water body 48 and keep outlet 52 covered. However, lacking the flow 54, there will be no elevation 56 and the chemical 40 will be completely disengaged from the body 48. Although an additional drain (e.g., a very small aperture) may be provided in the wall structure 46 to drain the water body 48 in the "off" condition, advantageously there is no such drain. Maintenance of the body 48 during an "off" interval is advantageous to minimize disturbance upon restart. Specifically, in the absence of the water body 48, unless other steps are taken, upon restart, the flow 54 would constitute a jet fired directly into the foraminate portion 44 and chemical 40, disturbing the chemical and causing a very high initial dissolution rate. Advantageously, the depth of the outlet 52 below the surface of the body 48 in the off condition is effective to damp such a jet so that, when the feeder flow is restarted, the elevated portion is more gently reformed in a wave or elevated portion fashion.

FIGS. 3-5 show greater details of an embodiment of the feeder 34. In Figures 3 and 4, the upper chlorinating section 35 and the lower body portion or base 86 of the feeder, a flow controller opening 37 including a control nob 39 adjusts the water flow through the feeder from an off/drain position to a maximum flow rate. Feeder water flow inlet 36 and water flow outlet 38 are also shown. In FIG. 5, the exemplary feeder has a central vertical axis 500 and is shown in an on condition. In the upper chlorination section of the feeder, a central elevation 502 of the surface of a dissolving body of water 504 penetrates a foraminate cover 70 secured about the mouth of a body 72 of a reservoir container 74 containing chemical 76. Exemplary chemical briquettes are 65% by weight calcium hypochlorite available from Arch Chemicals, Inc., Charleston, TN and weigh approximately 7 grams apiece and are 32mm long, 19mm wide, and 13mm thick.

Immersed within the body 504 is a flat fan nozzle 78 which expels an outlet flow 506. By way of size reference, the nozzle may have dimensions effective to carry a water flow rate of between 0.2 and 2 gpm at a pressure of 5 psi notwithstanding that the feeder may or may not actually be operated at such specific pressure. An exemplary nozzle is 50° flat fan available from Lechler, Inc. of St. Charles, Illinois as model 632.884.5E.BC. The nozzle 78 is secured to the upper end of a conduit 80 as is a wall structure 82 containing the body 504. Alternatively, the nozzle may be molded into the upper end of conduit 80



and is the same material as conduit 80. Overflow 508 from the body 504 falls into an outlet chamber 84 within a lower body portion or base 86 of the feeder.

The exemplary base comprises a principal member formed, for example, as a unitary molding of a polymer (e.g. polycarbonate). In the bottom of the outlet chamber is a second or outlet body of water 510 surrounding the conduit 80.

The feeder inlet and outlet 36 and 38 are respectively associated with first and second end portions 90 and 92 of a manifold 94. These exemplary end portions are tubular for mating with the conduits of the circulation system. As is described in greater detail below, the manifold serves to receive inlet water, direct at least a portion of such inlet water toward the chlorinating section of the feeder, receive chlorinated water from the chlorinating section, and outlet the chlorinated water toward the pool. Interposed between the manifold on the one hand and the conduit 80 and outlet chamber 84 on the other hand is a valve structure 95 governing the flows up into the conduit and down from the outlet chamber.

The manifold (FIGS. 6 and 7) is formed with a central, vertically extending tubular wall 98 which bounds a central aperture 96 about the axis 500. The aperture 96 permits passage of a valve actuation shaft as described below. An outer wall 100 of the manifold is spaced apart from the inner wall 98 allowing communication from the inlet to the outlet through the spaces between the walls 98 and 100. The manifold includes a pair of upwardly open areas 102 and 104 respectively toward the inlet and outlet sides from the central axis and wall 98. These open areas permit a diversion of a portion of the water flowing through the feeder to/from the chlorinating section. In an exemplary embodiment, feeder inlet and outlet flows 520 and 522 are identical and in the vicinity of 20-40 gallons per minute (gpm). The diverted flows 524 and 526 to/from the chlorinating section may be in the vicinity of 0.2-0.6 gpm, with a bypass flow, 528 passing between the walls 98 and 100 so as to bypass the chlorinating section, accounting for the difference.

The exemplary manifold is molded from a polymer such as polycarbonate. The exemplary manifold is molded with a pair of mounting brackets 106 extending upward from the respective inlet and outlet tubular portions and having upper surfaces for engaging an underside of the base 86 to which it may be secured such as via ultrasonic welding. The mating portion of the base underside (FIG. 8) comprises two sets of mounting ribs 107 on a portion of the base defining a bottom wall of the outlet chamber.

Between these is a depressed generally cylindrical valve element compartment 108. At the bottom of the compartment is a central generally horizontal web 110 having an aperture 112 of similar size to the manifold aperture 96 of FIG. 6. When assembled, the rim of the wall 98 is sealingly secured to the web 110 to align the apertures 96 and 112. The wall 100 and continuations thereof surrounding the open areas 102 and 104 are similarly sealingly secured to the web. A pair of inlet and outlet scoops 116 and 118 (FIGS. 5 and 8) depend from the web and penetrate the manifold open areas when assembled. The scoops 116 and 118 guide the respective flows 524 and 526 (FIG. 5) upward through the web from the manifold inlet 90 and downward through the web to the manifold outlet 92, respectively.

In the exemplary embodiment, the flows 524 and 526 proceed respectively from/to the chlorinating section through the valve structure 95. The valve structure includes a valve element 130 (FIGS. 9 and 10) generally including a hollow cylindrical portion formed by upper and lower flanges 132 and 134, which, when joined together, form sidewall 136. In the exemplary embodiment, the upper flange 132 is unitarily molded of a polymer such as low density polyethylene (LDPE) while the lower flange 134 is similarly molded (e.g., of LDPE) and sealingly secured together via hot plate welding. The valve element is formed having first and second ports 138 and 140 (FIG. 10) in the lower flange and first and second ports 142 and 144 in the upper flange. The first port 142 in the upper flange is centrally located and aligned with a lower inlet port 150 (FIG. 5) to the conduit 80. The first port 138 in the lower flange is spaced apart from the axis 500 so that, with the valve in an on orientation, it is aligned with the inlet scoop to receive an inlet flow. The first ports of the lower and upper flanges are in closed communication with each other via the valve element interior. The second ports of the lower and upper flanges are spaced apart from the axis 500, diametrically opposite the first port of the lower flange. The second ports are in closed communication with each other through a sleeve portion 152 depending from the upper flange. In the "on" orientations associated with the "on" conditions, the second ports are at least partially aligned with the outlet scoop 118 to permit flow 526 through such second ports and scoop. Likewise, the lower flange first port is similarly aligned with the inlet scoop 116 to permit the flow 524. Accordingly, the lower flange first and second ports respectively serve as inlet and outlet ports for the valve element and the scoops 116 and 118 serve as inlet and outlet ports for the chlorinating section above. A gasket 154 (FIG. 11) seals the lower flange to the upper surface of the

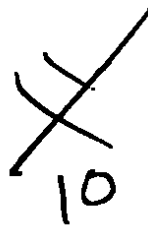
body web. The gasket includes inner and outer concentric portions and portions therebetween aligned with the scoops and with a drain aperture or port 158 in the web from which a sleeve 160 depends (described in further detail below).

An actuation shaft 170 (FIGS. 9 and 10) depends from the valve element and is secured thereto so as to control rotation of the valve element. The exemplary shaft 170 (FIG. 10) has an upper mounting flange 172 for mating with the valve element lower flange 134. To prevent relative rotation, a plurality of posts 173 ascends upward from the mounting flange and is received by complementary sockets 175 in the valve element lower flange 134. At its lower end, the shaft includes a faceted portion or other feature for engaging a complementary feature of a proximal end of a lever or control arm 180 (FIG. 12). The shaft passes through the central manifold aperture. User movement of a knob at the distal end of the lever 180 causes the valve element to rotate about the axis 500 through a plurality of orientations. As noted above, in a series of "on" orientations, the ports 138 and 140 are aligned with the scoops 116 and 118. The degree of alignment can provide a flow rate adjustment as a partial overlap of the ports 138 and 140 with respect to scoops 116 and 118 provides a somewhat restricted flow. In the exemplary embodiment, the outlet port 140 is relatively elongate in the radial direction as a generally curved obround. The inlet port 138 is a series of small holes to provide that, in the restricted conditions, the inlet flow is more restricted than is the outlet flow to avoid undesirable accumulation of water. In making this series of holes, sensitivity is decreased, making it easier for the user to adjust the flow through the chlorinating section and, thereby, the feed rate. In yet another orientation, an "off/drain" orientation, the port 140 is aligned with the drain sleeve 160 and the port 138 is completely blocked by the web. In this condition, there is substantially no flow through the scoops 116 and 118. Rather, the drain flow may pass through the valve element and through the sleeve 160 and into a drain pan 190 (FIG. 5).

Above the valve element, the exemplary conduit 80 (FIG. 13) is principally formed by a tubular portion or tube 200 of a unitarily molded structure (e.g., of polycarbonate) 202. The exemplary conduit outlet is provided by the nozzle 78 which may be threaded into an internally threaded upper end of the tube 200. At the lower end of the tube, a flange 204 may extend radially outward and may be provided with structural reinforcing ribs 206 and apertures 208 (discussed below). A step in the flange extends vertically upward and

has an externally threaded outer portion 212 (FIG. 14). At the top of the portion 212, the flange continues further outward to a rim 214. At at least one point along the rim, the flange is formed with a pawl portion 216 defined by a slot 218 having intersecting radial and circumferential portions. The structure 202 is received in an upper portion of the valve compartment 108 immediately above the valve element. The threaded portion 212 is received by a complementary threaded portion 220 (FIG. 11) formed by a step in the valve compartment wall. Alternatively, the flange 204 may be secured to base 86 by means of plastic (PVC) bolts rather than the threaded structure. When assembled, and screwed in place, a barb 224 of the pawl 216 engages one of a plurality of detent indentations 226 in the upper surface of the outlet chamber bottom wall to angularly secure the structure 202 in place. When so secured, the underside of the flange 204 bears against inner and outer o-rings 230 and 232 (FIG. 17) carried in channels in the upper surface of the valve element upper flange (FIG. 14). The o-rings respectively seal inlet and outlet flow paths and the structure is tightened into the valve compartment to a point where one of its apertures 208 is in alignment with the outlet scoop while another is in alignment with the drain sleeve to respectively facilitate outlet and drain flows.

In the exemplary embodiment, a molded outlet chamber cover member 250 (FIG. 14) serves multiple functions, including providing, at a central portion, the wall structure 82 (FIG. 5) which defines the dissolving chamber. A central tubular portion 252 of the member lies at the lower end of the wall structure 82 and receives an upper end of the conduit 80 and is sealingly secured thereto via an o-ring riding in a groove in the conduit. The wall structure 82 includes a first flange portion 254 extending radially outward from an upper extreme of the tubular portion 252 and a first frustoconical portion 256 extending upward and radially outward from the upper/outward extreme of the portion 254. A second flange portion 258 extends radially outward from the upper/outward extreme of the portion 256. A second frustoconical portion 260 extends upward and outward from the outward end of the portion 258. The exemplary portion 260 has a plurality of openings 262 permitting overflow from the dissolving chamber to the outlet chamber. At the upper end of the portion 260, an upper flange 264 (FIGS. 14 and 15) extends radially outward and an internally threaded collar portion 266 extends further upward. With the conduit structure 202 installed in the body, the outlet chamber cover member 250 is placed downwardly thereover to install.



In an exemplary two locations along the top flange perimeter, a pair of pawls 270 (*FIG 14) depend. Projections on the pawls 270 engage complementary indentations 272 in the outlet chamber sidewall. One or more channels 274 in the perimeter of the top flange receive complementary vertical ribs 276 in the outlet chamber sidewall to angularly locate the member 250. Apertures 278 near the base of the collar 266 and root of the top flange 264 permit drainage of any water accumulating on the top flange. The internally threaded collar receives a complementary externally threaded portion of a treatment chemical container serving as a reservoir.

FIG 16 shows further details of the exemplary container 74 including the foraminate cover 70 (e.g., molded of HDPE), the body 72 (e.g., molded of HDPE), and a shipping/storage cap or cover 271 removed prior to installation of the container on the feeder. The exemplary cover 271 may engage the same external threads on the body 72 used to mount the container to the feeder.

In the exemplary embodiment, the feeder cover 300 (FIG 5) is secured above the feeder base enclosing the chemical container and sealingly enclosing a headspace of the outlet chamber. The exemplary cover is molded of a plastic material such as polycarbonate and is, advantageously, substantially transparent although it preferably may be tinted. The exemplary cover includes a roughly paraboloid dome 302 terminating in a radially outwardly extending flange 304. An o-ring 306 accommodated within an annular channel in a rim of the feeder base seals the cover to the base. To maintain compressive engagement between the flange 304 and the base, a locking member 320 (FIG 17) is provided. The exemplary locking member includes a first internally threaded locking ring portion 322 and a handle 324 extending upward from diametrically opposite points on the ring. The exemplary member 320 is unitarily molded of a polymer (e.g., polycarbonate). The ring 322 is dimensioned to fit over the flange 304 with a downward facing internal shoulder of the ring engaging an upper surface of the flange. The ring 322 is screwed onto an externally threaded portion of the base rim outboard of the o-ring 306 to compress the flange 304 against the o-ring. The handle 324 is dimensioned to overarch the dome 302 when so installed.

In operation of the exemplary embodiment, in an "on" condition, a principal flow through the feeder is through the manifold inlet to the manifold outlet without passing through the chlorinating section. A relatively small portion of the inlet flow is diverted by

the inlet scoop to the chlorinating section (the exact proportion being user adjustable via rotation of the valve element). The diverted flow proceeds upward through the valve element and conduit into the dissolving chamber and, via the elevation of the surface thereof, into the chemical reservoir. Overflow from the dissolving chamber contains dissolved treatment chemical and proceeds through the apertures 262 to fall into the outlet chamber. The intact portions of the wall 260 between the apertures 262 are believed advantageous to reflect waves with the reflected waves tending to cancel the incident waves. This may provide a more stable surface profile along the elevation with a single central elevation or wave 502 in the body of water 504.

From the outlet chamber, the diverted water flows through the valve element and outlet scoop to rejoin the principal flow exiting the manifold. As chemical in the container is dissolved and depleted, the remaining chemical will fall downward. The closed body of the container will tend to fill with air from the headspace of the outlet chamber in order to fill the space vacated by the descending stack of treatment chemical. As this occurs, the level of water in the outlet chamber will gradually rise correspondingly. By sealing the headspace, and thereby largely conserving the amount of air present, the cover 300 helps prevent the level of water in the outlet chamber from rising too high. The level of water in the outlet chamber is advantageously kept well below the chemical in the container, preferably, at some intermediate height along the conduit 80. In operation, the headspace is maintained at an elevated pressure, e.g., 0-8 psig and, typically 3-4 psig. The body and cover are sufficiently robust to withstand all operating pressures with a margin of safety. Advantageously, this includes withstanding a headspace pressure of up to 10 psig.

The feeder may be placed in the "off" condition, for example, in order to replace the container or simply when it is not desired to add chemical to the flow. To do this, the user simply rotates the valve element to the "off" position. In this position, the entirety of the flow through the inlet port 90 is directed through the outlet port 92 without passing through the chlorinating section. In this condition, the outlet chamber may drain through the valve element into the drain pan 190. The cover locking member 320 may be removed by unscrewing and the cover 300 then removed. At this point, the container 74 may be unscrewed and replaced. The cover 300 and locking member 320 may then be replaced and the feeder returned to a desired "on" condition.



In one minor variation on this system, substantially the entire flow through the feeder may be directed through the chlorinating section in the "on" condition. This may be particularly relevant for use in a setup wherein the feeder is not located in the primary flow path of the circulation system but is located so that only a small diversion of the total flow through the circulation system passes through the feeder.

FIG. 18 shows details of an alternate feeder base 360 which may be largely similar to the base 86. As does the base 86, the base 360 may include a valve element. This valve element may differ from element 130 in the construction of its lower flange 362. This lower flange includes an array of apertures serving as its first port. FIG. 18 shows a single approximately circumferential array of apertures extending from a first aperture 364 through a plurality of intermediate apertures 366 to a last aperture 368. In the series of "on" orientations for this valve element, one-to-all of these apertures are brought into alignment with the feeder body inlet port therebelow. In an exemplary implementation, the first aperture 364 is 0.055 inch in diameter and the remaining apertures 366 are 0.033 inch in diameter and are spaced at 5° increments about the valve element axis. The first aperture 364 is sized to initiate a baseline flow of about 0.15 gallons per minute. The remaining apertures 366 add incrementally to this flow. Optionally, a final aperture 368 may be relatively large so as to provide a large final increment to establish a particularly high flow rate in a shock treatment mode.

FIGS. 19 and 20 show a valve element 370 including the lower flange 362. The lower flange has a depending keying projection 372 (FIG. 19) which fits within a channel 374 (FIG. 11) to limit the rotational range of the element.

A second difference between the element 370 and the element 130 is associated with a difference between the conduit unit structure 376 (FIG. 21) and the structure 202 of FIG. 13. Specifically, the upper flange 380 of the element 370 has a flat upper surface 382 for bearing against inner and outer o-rings 384 and 386 (FIG. 17) (e.g., formed of VITON fluoroelastomer (DuPont Dow Elastomers L.L.C., Wilmington, Delaware) with PTFE and graphite). These o-rings are formed having a section resembling a semi-circle atop a rectangle, with the rectangular portion carried in downwardly open channels in the lower surface of a flange portion 388 of the structure 376). Also, in the exemplary structure 376, the nozzle is unitarily incorporated rather than being a separate piece.

FIG 22 shows a feeder 410 associated with a circulation system 412 to/from a pool 414. Principal flow to/from the pool proceeds initially through a skimmer box 416 through a hair and lint strainer 418 to a pump 420 and therefrom returning to the pool in a return line 422. A diverter 424 is mounted in the return line 422 and has first and second lines 430 and 432 going respectively to and from the feeder 410 (FIG 22). The first and second lines mate with first and second fittings 440 and 442 (FIG 23) mounted to the underside of the feeder base (FIG 23) and replacing the manifold and scoops of the feeder 34.

FIG 24 shows the diverter 424. The diverter has a generally cylindrical one-piece molded body 450 extending from an upstream inlet end to a downstream outlet end. Molded inlet and outlet end caps 452 and 454 have a stepped tubular structure with smaller and larger diameter portions for respectively mating with smaller and larger flexible hose (e.g., 1.25 inch and 1.5 inch ID) forming the pool return line 422. First and second upstream and downstream port fittings 456 and 458 extend from the main portion of the body and connect to the lines 430 and 432, respectively. The exemplary fitting 456 is located proximate a restriction 460 in the body. The exemplary restriction 460 (FIG 26 with inlet end cap removed) forms a ramp 462 extending inward to block a substantial portion of the transverse cross-section of the body. A tubular extension 464 of the fitting 456 extends into the body to meet the ramp 462 and has an upstream-facing aperture 466. As water passes through the diverter, a portion is forced through the aperture 466 to serve as the feeder inlet flow. The feeder outlet flow returns through the port 458. An exemplary application for the diverter 424 is a relatively low flow application involving approximately 20-50 gallons per minute flow through the pool return line. With this relatively low flow, a relatively high restriction is desired to provide an appropriate pressure difference across the diverter and thereby an appropriate flow through the feeder. For example, the ramp 462 may obstruct slightly more than half the cross-section of the diverter.

FIGS. 25 and 27 show an alternate diverter in which the ramp restricts slightly less than half the cross-section. This may be suitable to provide a similar flow through the feeder at a higher return line flow (e.g., 45-100 gallons per minute). This may be the case for relatively larger pools (typically in-ground), which use rigid conduit as a return line instead of flexible hose. Accordingly, this alternate diverter lacks hose fittings.

For purposes of illustration, a number of principal structural portions of the feeder



are shown sectioned as if molded as thick-walled products. However, commercial products are preferably molded to produce thin walls via techniques such as injection molding. The views may also reflect other artifacts of the particular CAD process used to generate the drawings and of various engineering simplifications, none of which would affect the disclosure to one of ordinary skill in the art.

One or more embodiments of the present invention have been described.

Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, there may be manifold physical implementations of the basic functional principles which have been outlined.

Various manufacturing considerations may influence the form taken by any production feeder. Use in applications beyond swimming pools (e.g., industrial applications) is possible as is use in dispensing a variety of chemicals (e.g., sodium bisulfate useful for control of pH levels). Accordingly, other embodiments are within the scope of the following claims. All patent applications, patents and other publications cited herein are incorporated by reference in their entirety.

12. The device of claim 10 wherein:

the valve element (130) comprises upper and lower surfaces;

an actuation shaft (170) depends from the lower surface; and

a lever (180) extends radially from the actuation shaft (170) and is graspable by the

5 user to rotate the valve element (130) between the plurality of orientations.

13. The device of claim 10 wherein:

the valve element (130) comprises upper and lower surfaces (132 and 134);

the valve element is held in compression between a flange at a proximal end of the

10 conduit and a body portion of the feeder; and

the valve element has a first upper port aligned with an inlet of the conduit and a first lower port in communication with the first upper port and radially displaced from the valve axis.

15 14. The device of claim 10 wherein the valve element comprises:

upper and lower surfaces;

an inlet port (150) in the lower surface, radially displaced from the valve axis and receiving water from the feeder inlet in the first feeder condition;

20 a central outlet port (142) in the upper surface and admitting water to the first conduit in the first feeder condition; and

a passageway penetrating the upper and lower surfaces and passing the overflow in the first feeder condition.

25 15. The device of claim 14 wherein the inlet port in the lower surface comprises an array of apertures (208) in a lower flange (204) of the valve (95), the apertures arranged at a plurality of different angular locations about a central axis of the valve element (130).

16. The device of claim 1 wherein:

30 in said first feeder condition, a flow through the conduit outlet (78) represents a diversion of between 0.5% and 10% of a flow between the feeder inlet (36) and outlet (38);



in a second feeder condition, there is substantially no flow through the conduit outlet (78) and the flow between the feeder inlet and outlet is substantially the same as in the first feeder condition.

5 17. The device of claim 1 wherein the chemical consists essentially of calcium hypochlorite, dichloroisocyanuric acid, trichloroisocyanuric acid or combinations thereof.

18. The device of claim 17 wherein the water flow is a recirculating flow to/from a swimming pool and the chemical consists essentially of briquetted calcium hypochlorite.

10

19. The device of claim 1 wherein the reservoir comprises:
a container (24) nondestructively removably coupled to a receptacle portion of the feeder and having an interior and a mouth, the mouth being covered by said foraminate lower portion (70).

15

20. A feeder device for introducing a chemical into a flow of water comprising:
a feeder inlet (36) and a feeder outlet (38);
a reservoir (74) of the chemical in solid form and having a foraminate lower portion (70);

20 a first conduit (80) having an outlet (78) and in communication with the feeder inlet (36) in at least a first feeder condition;

means for maintaining a body of water in which said conduit outlet (78) is immersed in at least said first feeder condition;

means for altering flow through the conduit to locally elevate a surface of said body between:

25

a first level (502) in said first feeder condition in which the body contacts the chemical in the reservoir so as to dissolve such chemical;

a second level in a second feeder condition in which the body does not contact the chemical in the reservoir; and

30 means for, in at least said first feeder condition, directing flow (526) containing the dissolved chemical from the body to the feeder outlet (38).

21. The device of claim 20 wherein said conduit outlet (78) comprises a flat fan nozzle aimed upward and the elevation is limited to a central portion of an upper surface of the body above the flat fan nozzle.
- 5 22. The device of claim 20 wherein said means for maintaining comprise a wall having:
a plurality of first apertures (208) through which said overflow passes in said first feeder condition.
- 10 23. The device of claim 20 wherein:
the reservoir comprises an inverted polymeric bottle (74) having an externally threaded portion engaged to an internally threaded receptacle of the feeder when installed thereto;
a removable feeder cover (300) has an installed condition covering the inverted bottle and
15 sealed relative to a feeder body so as to permit a feeder headspace to be maintained at a pressure of 8 psig.
24. A pool water treatment system comprising:
the device of claim 1;
20 at least one pump (30);
a filter (32); and
a conduit network (26, 28) coupling the device, pump, and filter to a swimming pool for filtering and chlorinating a recirculating a flow of water to/from the pool.
- 25 25. A device for introducing chlorine from a chlorine-containing pool treatment chemical into a flow of water to/from a swimming pool comprising:
a feeder inlet (36) receiving water from the flow;
a reservoir (74) of the chemical in solid form and having a foraminate lower
portion (70);
30 a first conduit (80) having an outlet (78) and in communication with the feeder inlet (36) in at least a first feeder condition;

a wall (82) surrounding the conduit outlet and extending upward thereof and, in at least said first feeder condition, maintains a body of water in which said conduit outlet is immersed, the first conduit in said first feeder condition discharging water through the conduit outlet at a rate and speed effective to locally elevate a first surface portion of the body by a height of between 0.125 inch and 1.0 inch above another surface portion of the

an outlet chamber which in at least said first feeder condition receives said dissolved chemical; and

a feeder outlet returning said dissolved chemical to the flow.

26. The device of claim 25 wherein said height is between 0.25 inch and 0.5 inch.

27. The device of claim 25 wherein said foraminate lower portion is at least 0.0625 inch above said another surface portion.

28. A method for introducing a treatment chemical into a body of water at a controlled rate comprising the acts of:

providing a feeder having an inlet (36), an outlet (38), and containing a solid chemical in a chemical reservoir (74);

causing a flow of water from the body to enter the feeder through the inlet and exit through the outlet to return to the body so as to run the feeder in at least a steady state first condition wherein:

at least a first portion of the flow is directed through a conduit outlet (78) into a first body of water so as to produce at least one local elevation of a portion of a surface of that first body, the local elevation contacting a foraminate lower portion of a reservoir of said treatment chemical in solid form so as to dissolve said treatment chemical; and

said dissolved treatment chemical is directed to said outlet; and
restricting at least said first flow portion so as to disengage the first body of water from the reservoir and cause the feeder to enter at least a steady state second condition.

29. The method of claim 28 wherein in the second condition the conduit outlet remains immersed in the body.

30. The method of claim 29 wherein the first portion of the flow represents between
5 0.1% and 10% of a total flow through the feeder.

31. The method of claim 28 wherein the restricting comprises turning a valve element (130) from a first orientation in said first condition to a second orientation.

10 32. The method of claim 28 further comprising:
removing a feeder cover (300);
removing the reservoir (74) in a depleted condition;
replacing the reservoir with an undepleted replacement reservoir;
replacing the feeder cover; and
15 de-restricting the flow to return the feeder to the first condition.

33. A chemical container (74) in a condition installed on a receptacle of a chemical feeder and, comprising:
said chemical, comprising in major part calcium hypochlorite;
20 a molded plastic body containing the chemical and having:
an open lower end;
a closed upper end; and
an externally-threaded portion proximate the lower end in threaded
engagement to a complementary internally-threaded portion of the receptacle; and
25 a foraminate cover (70) extending across the container mouth and at least partially supporting the chemical and having a central portion immersed in a locally elevated central portion of a body of water.

34. The chemical container of claim 33 wherein:
30 the body and foraminate cover consist essentially of polyethylene.

16
X

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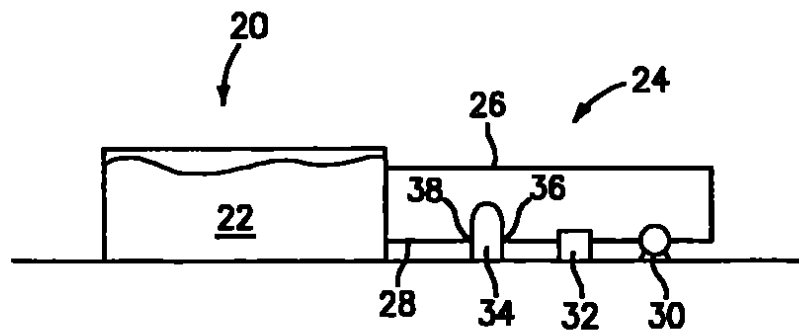


FIG. 1

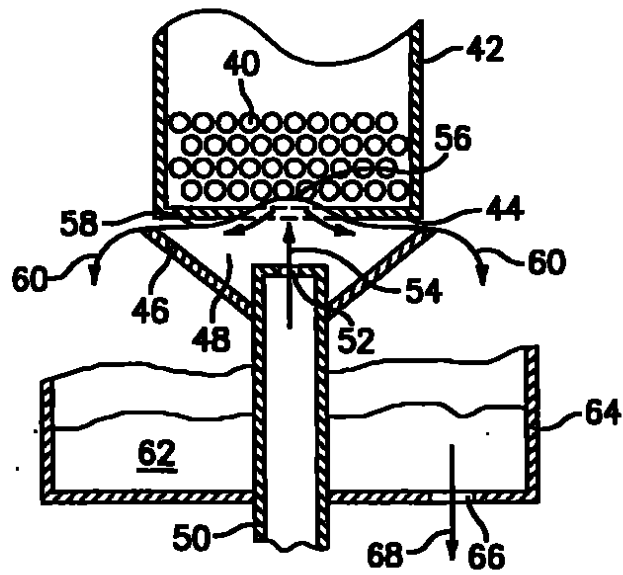


FIG. 2

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28
/

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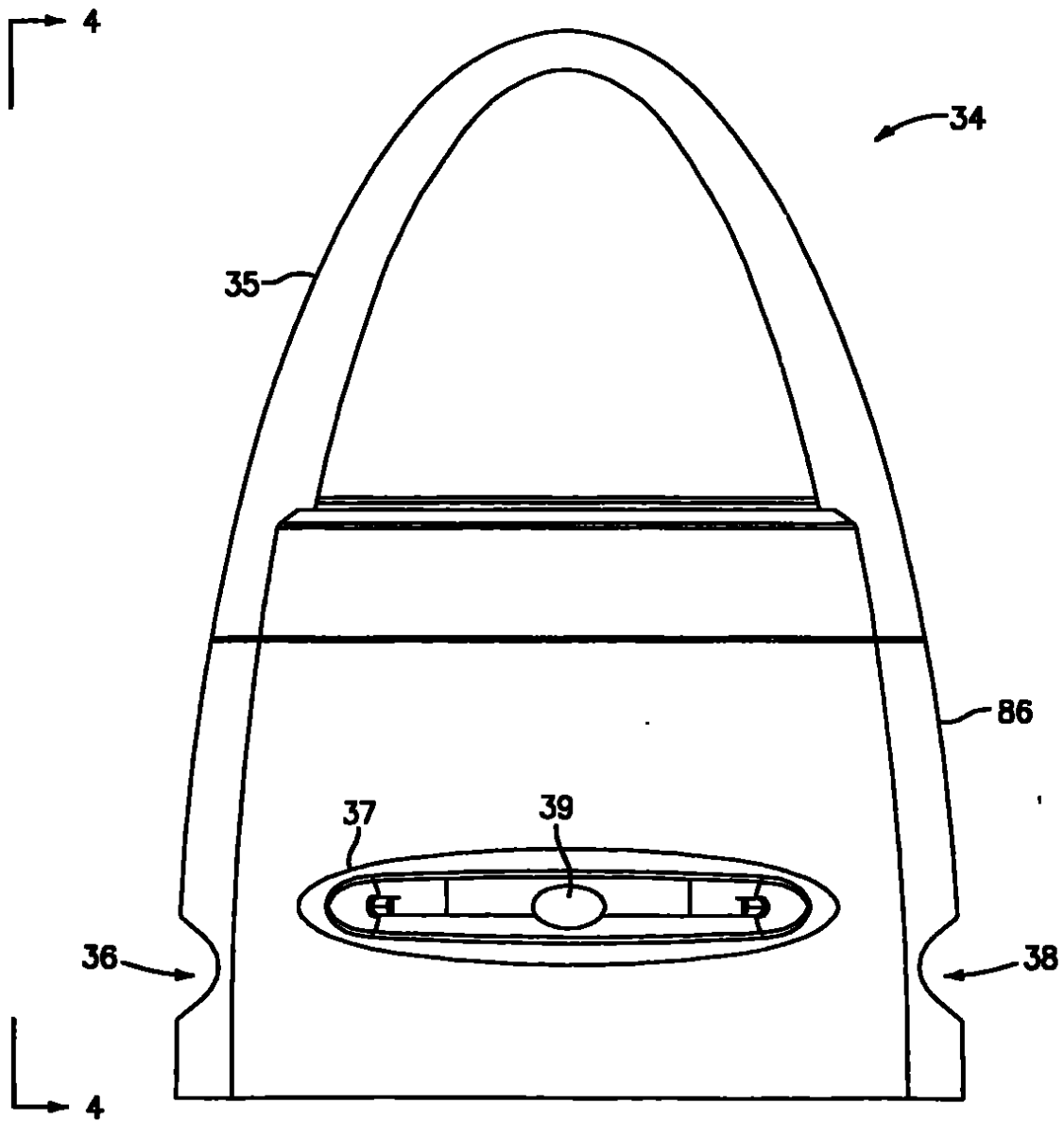


FIG. 3

18
57
X

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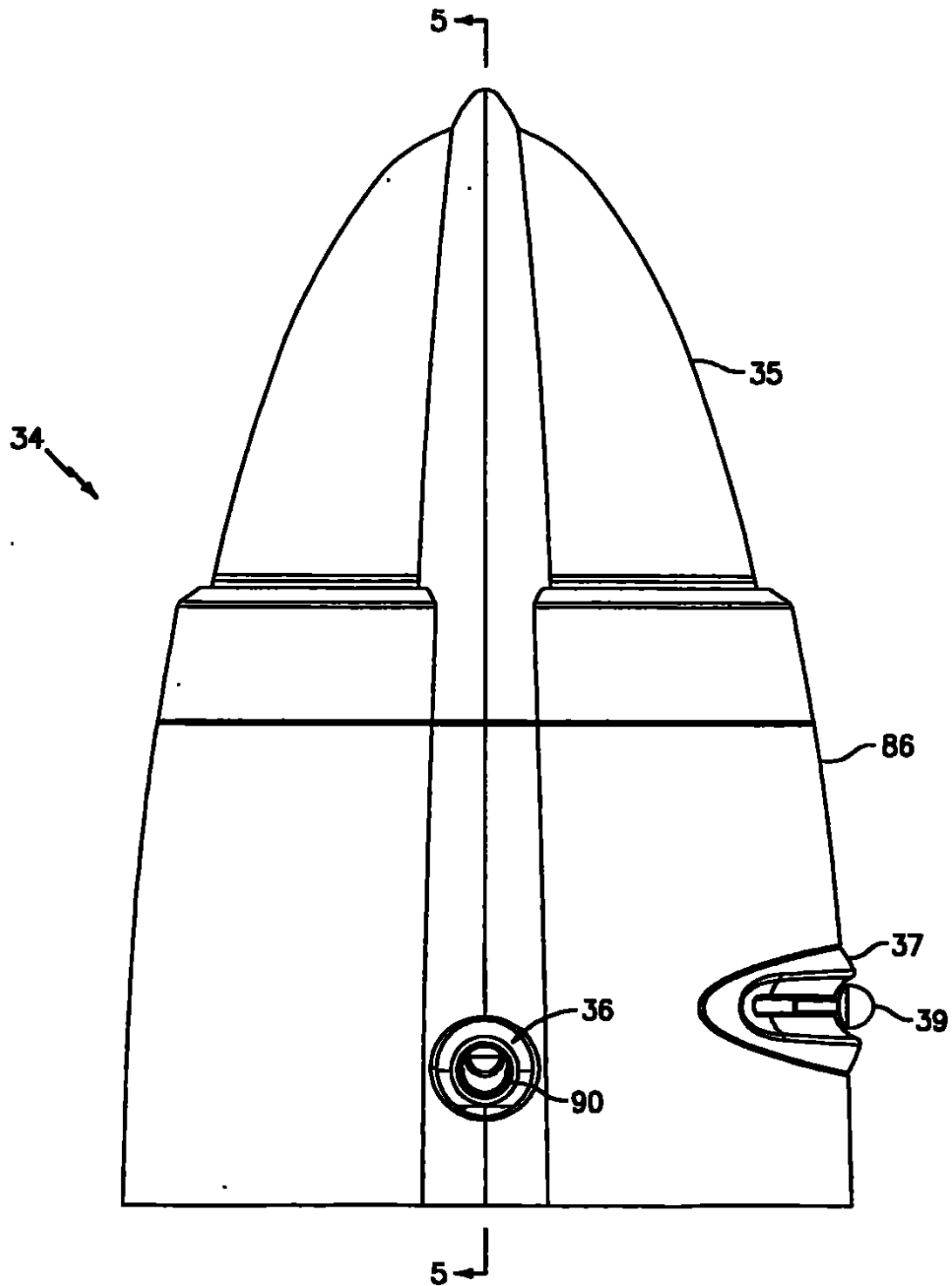


FIG. 4

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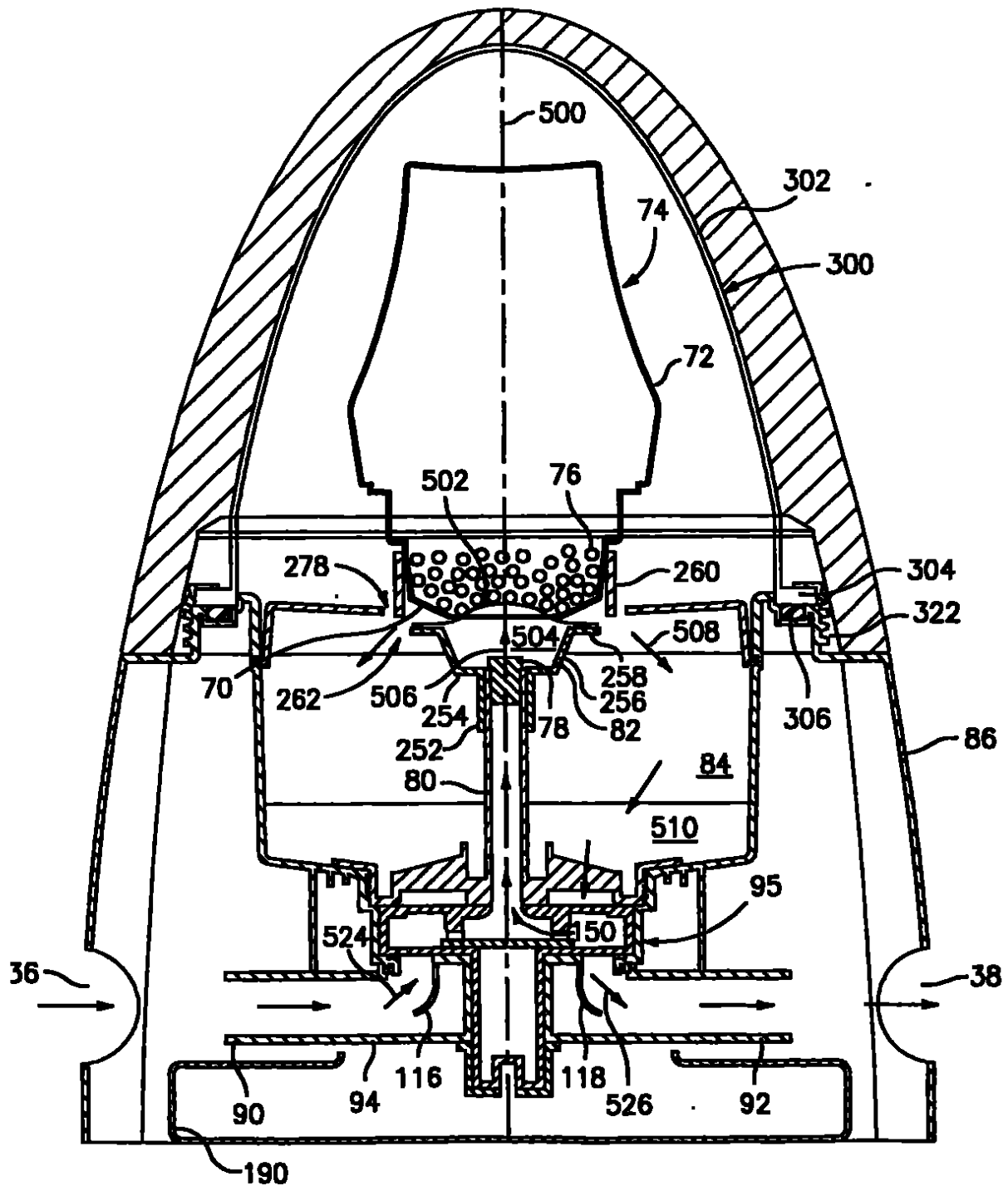


FIG. 5

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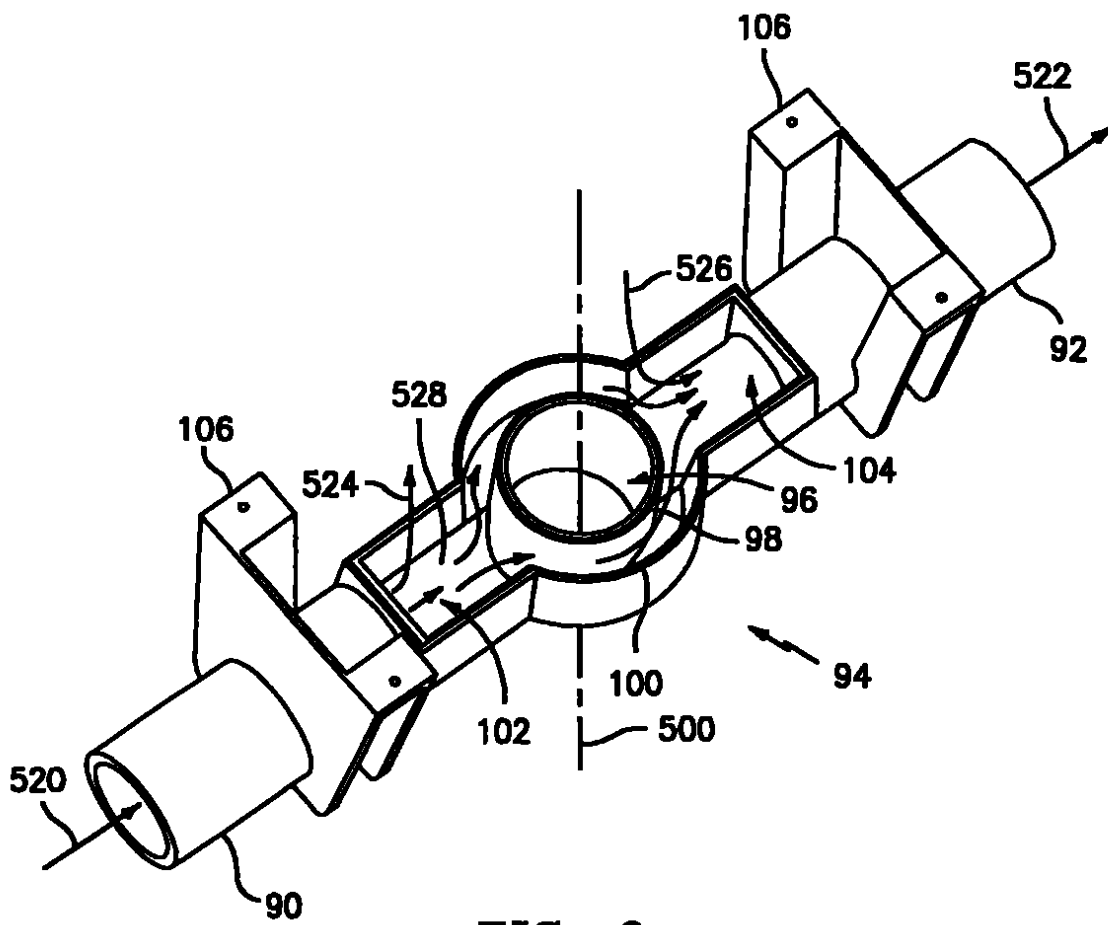


FIG. 6

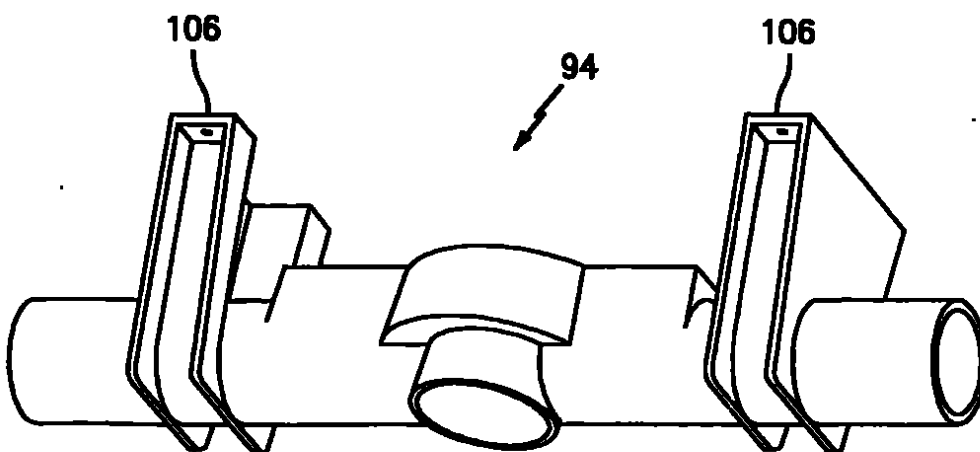


FIG. 7

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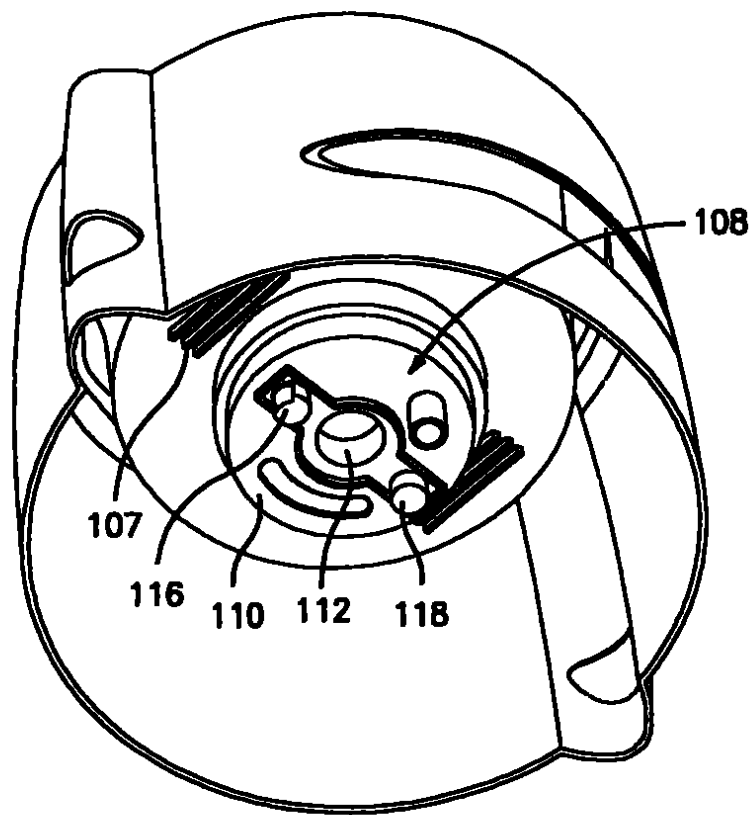


FIG. 8

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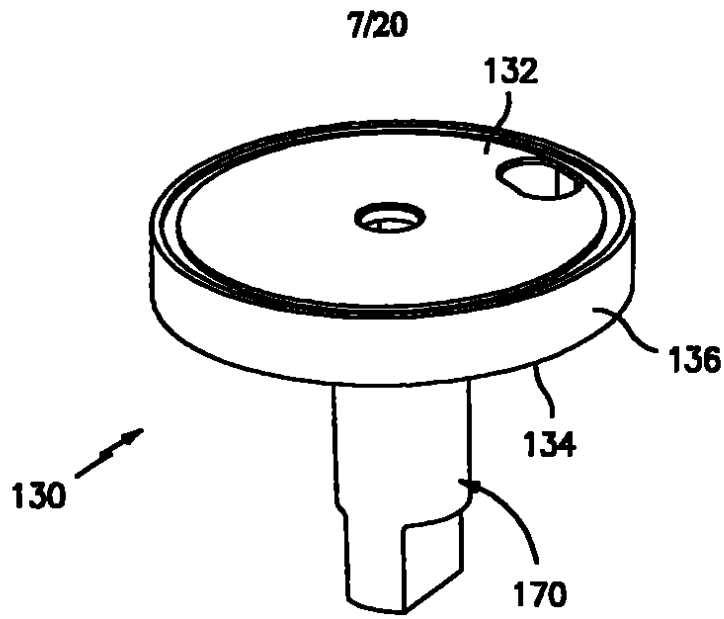


FIG. 9

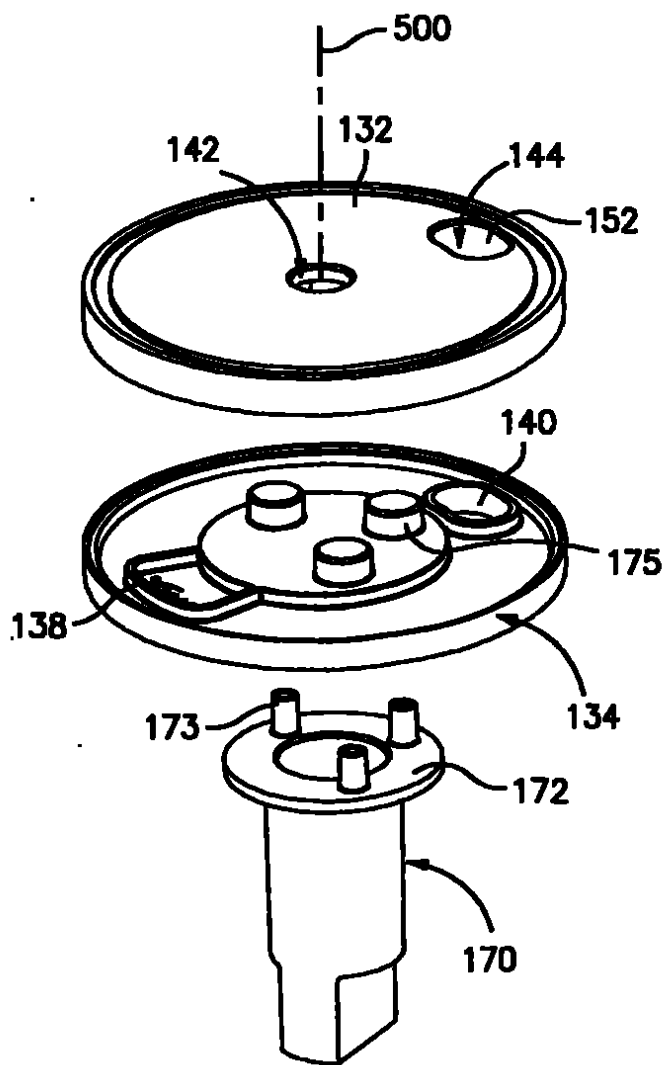


FIG. 10

23

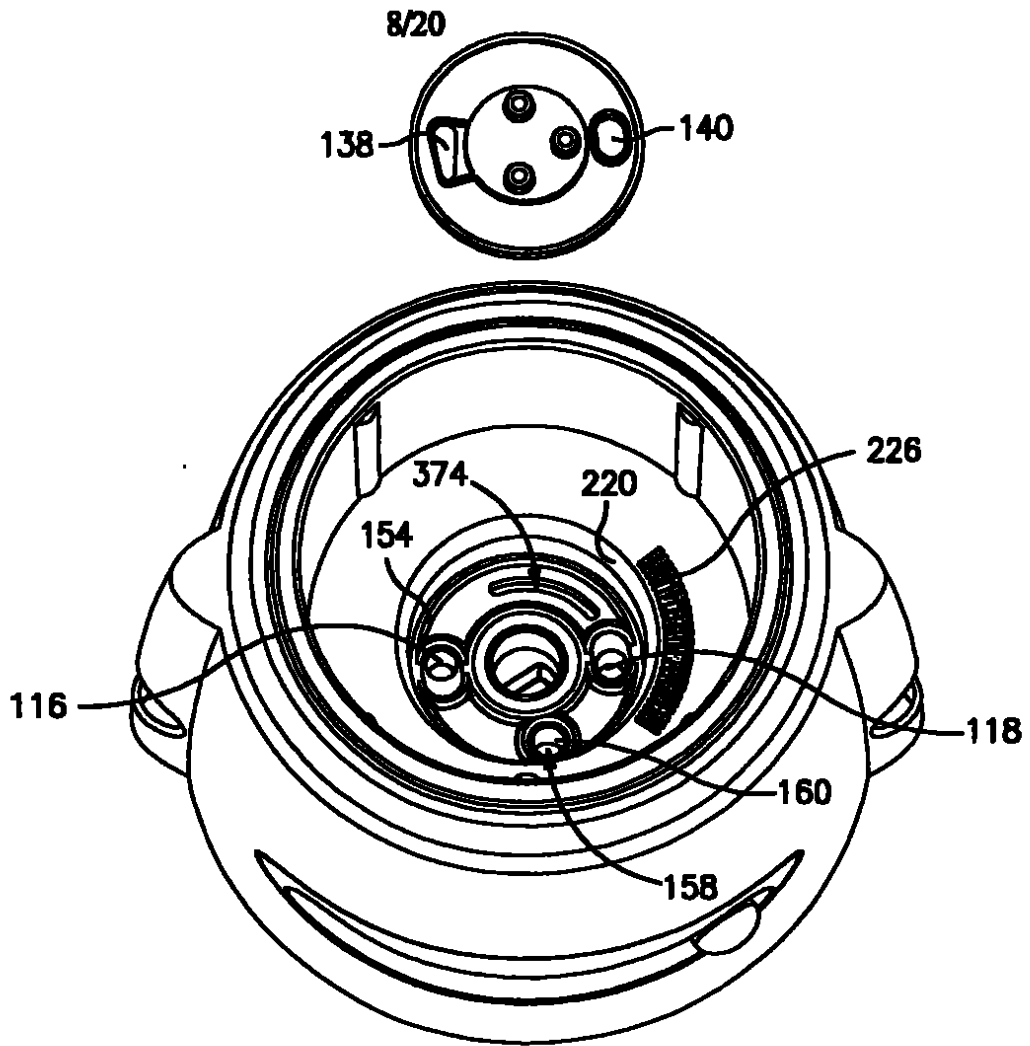


FIG. 11

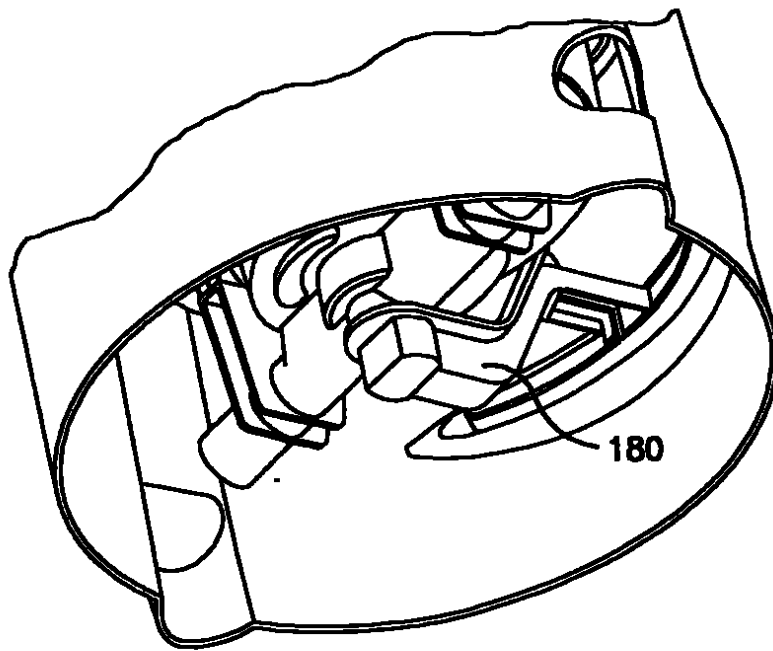


FIG. 12

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/

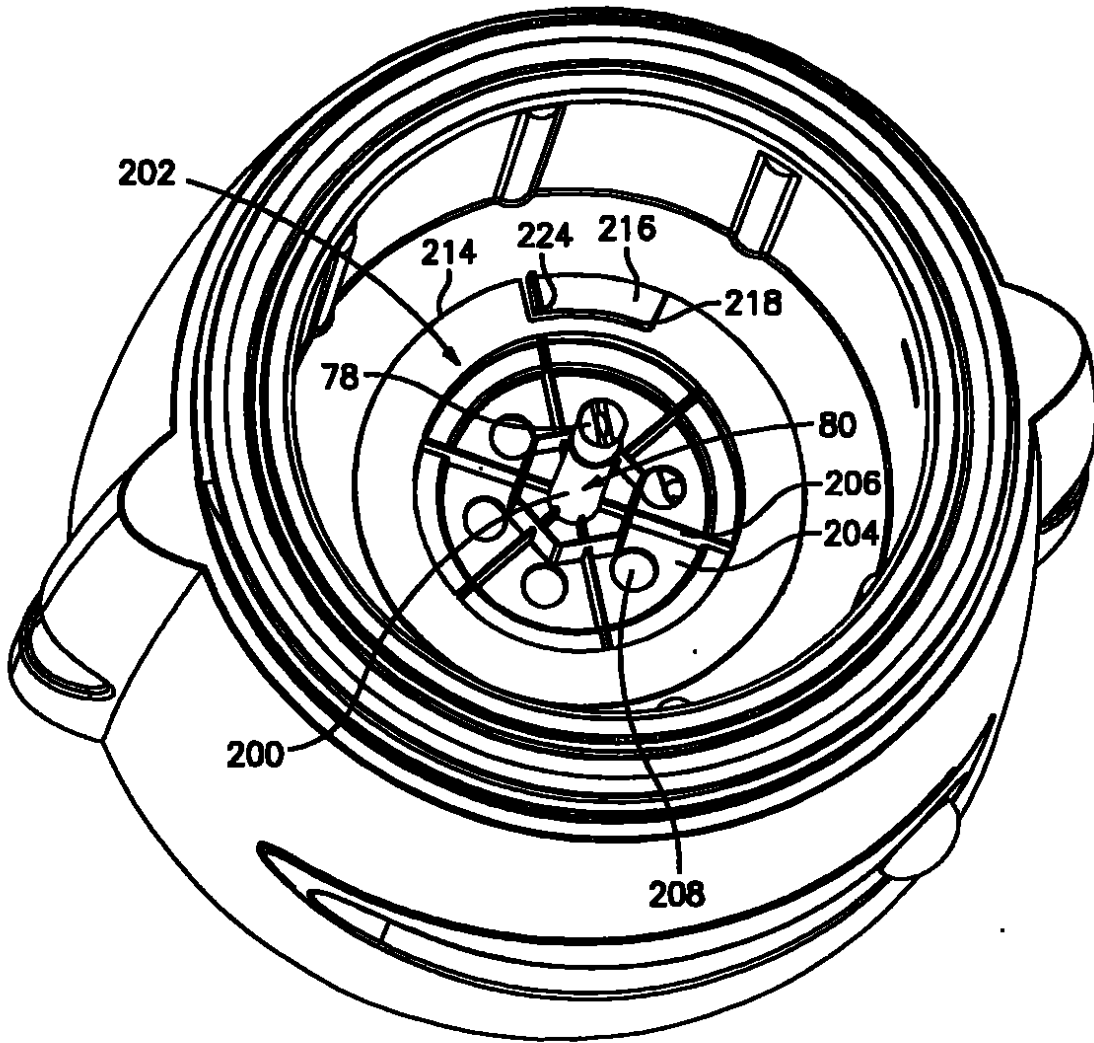


FIG. 13

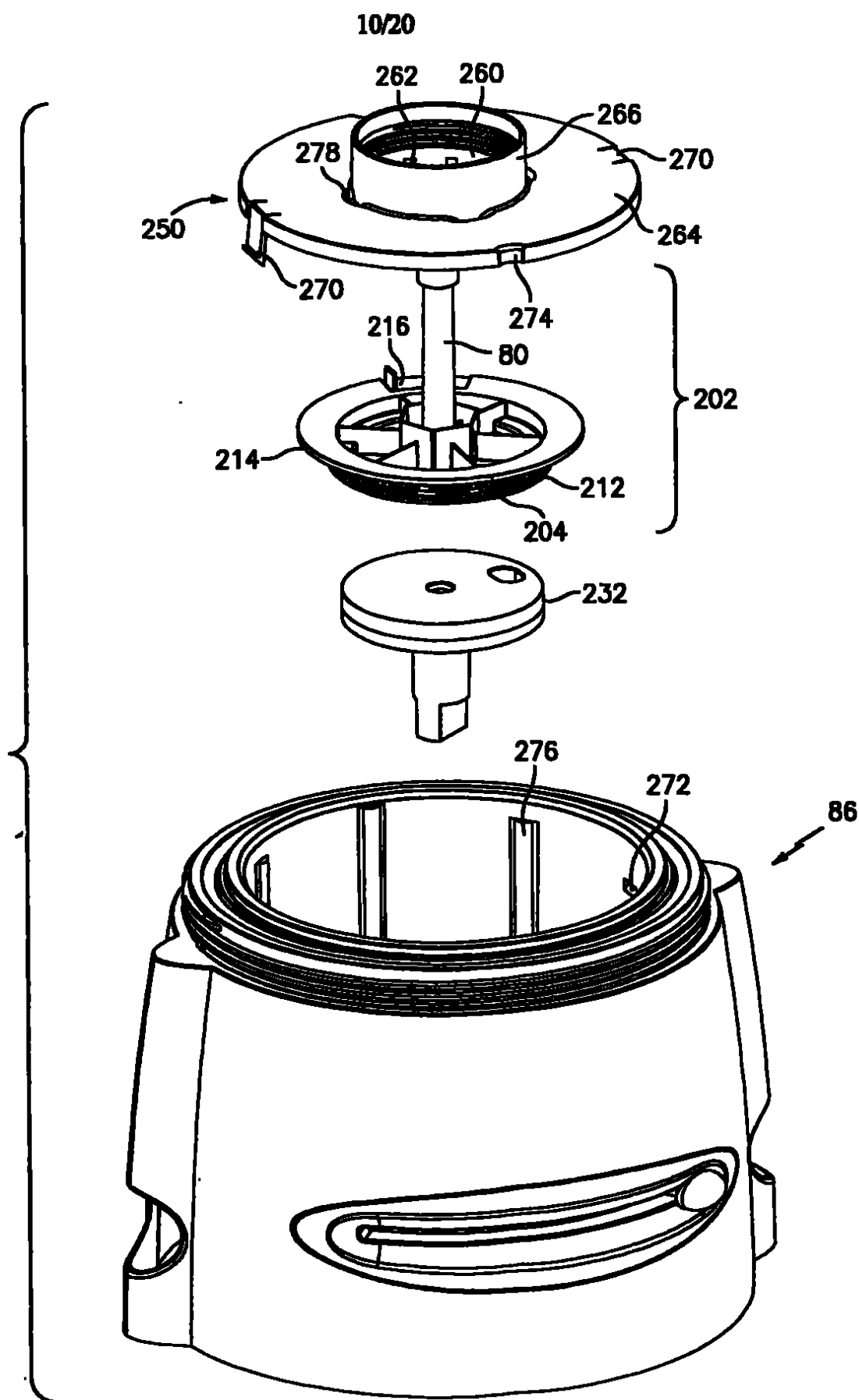


FIG. 14

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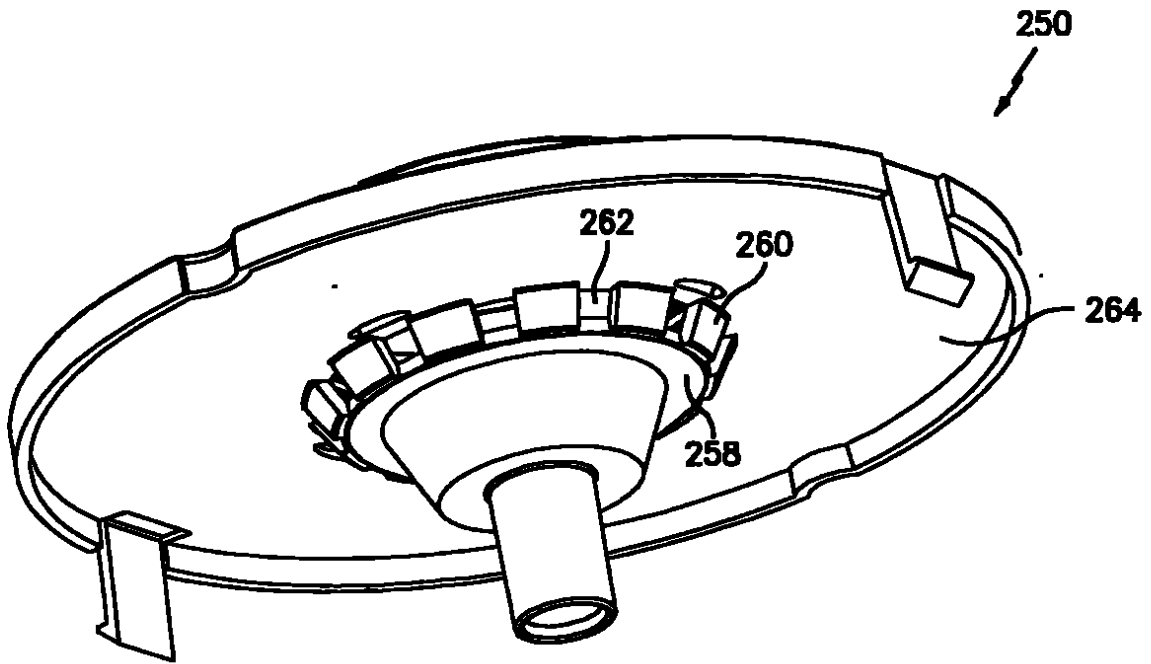
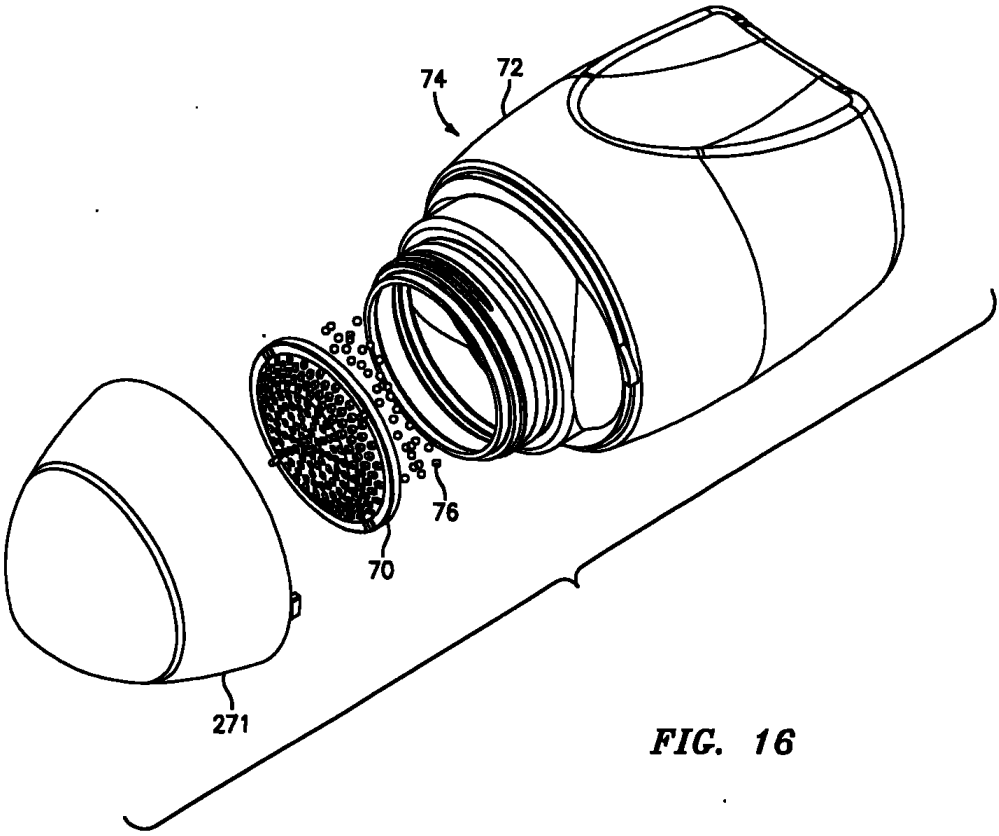


FIG. 15

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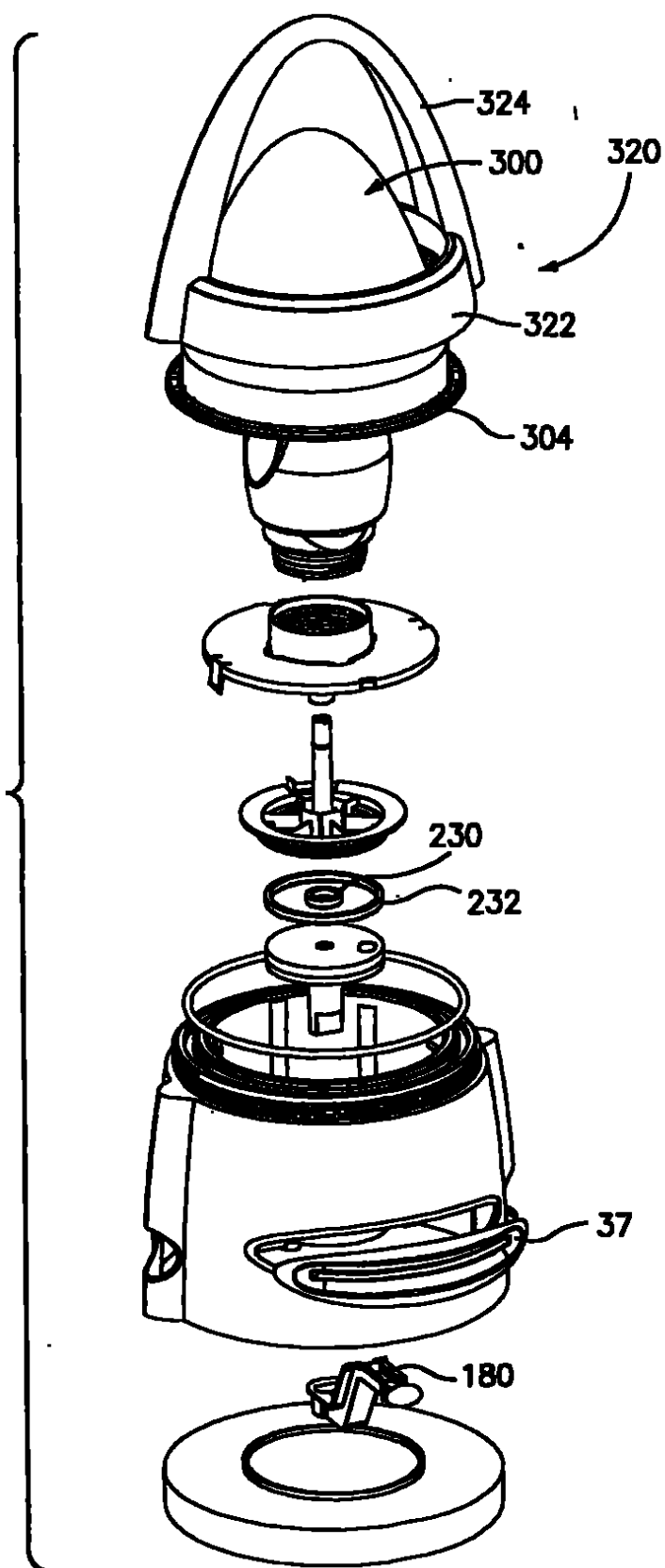


FIG. 17



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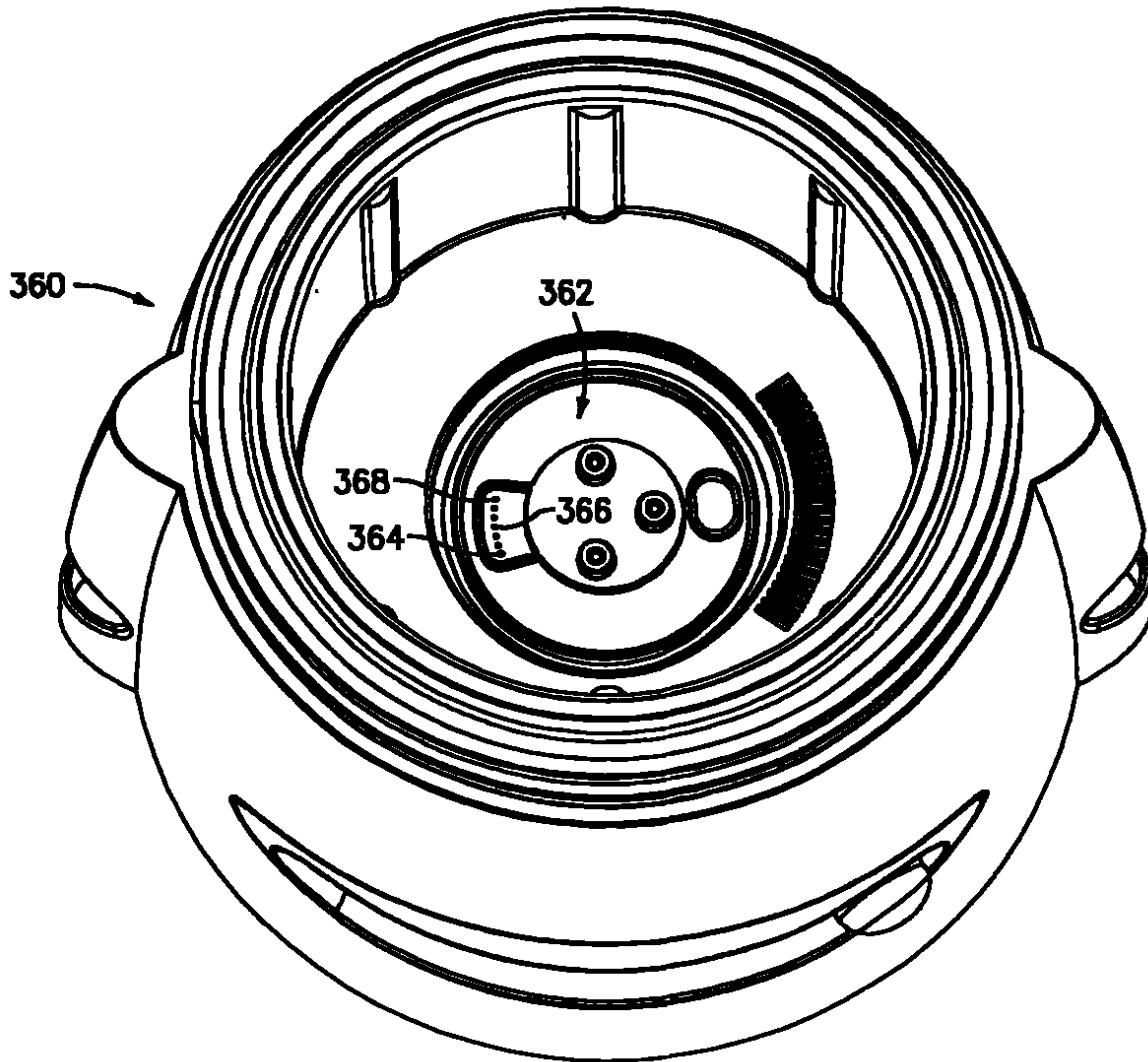


FIG. 18

30
X
M

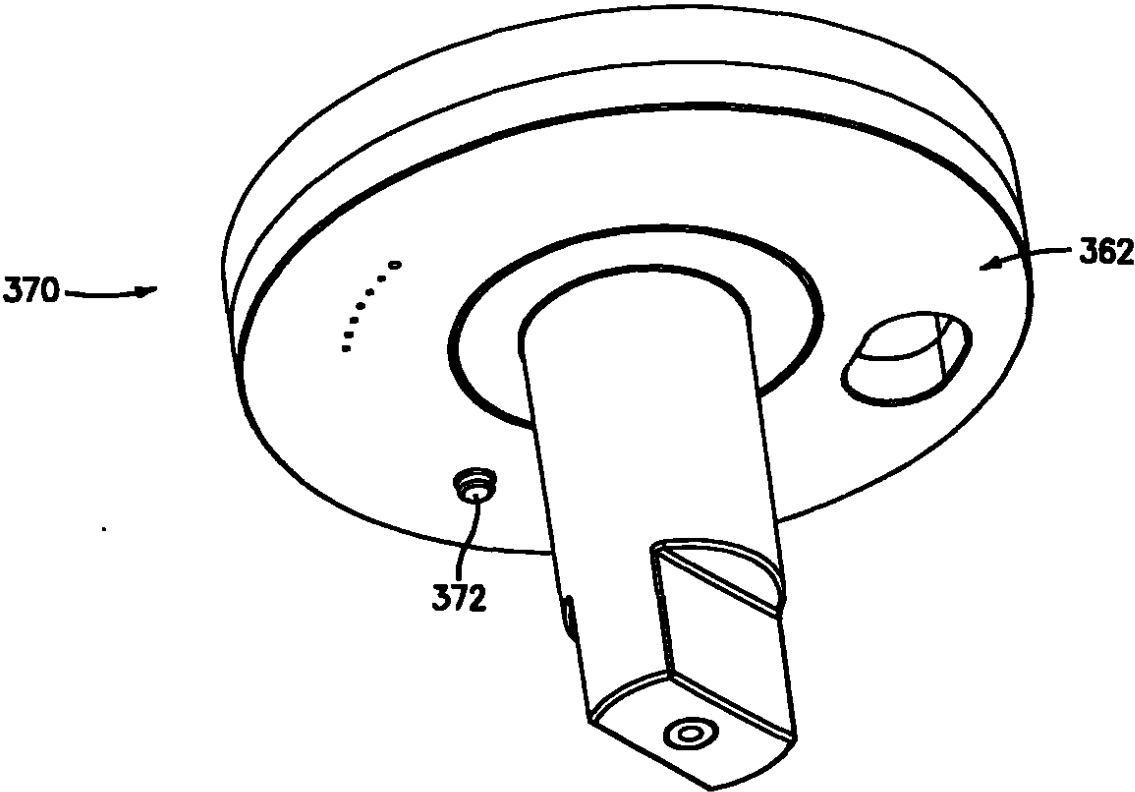


FIG. 19

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22

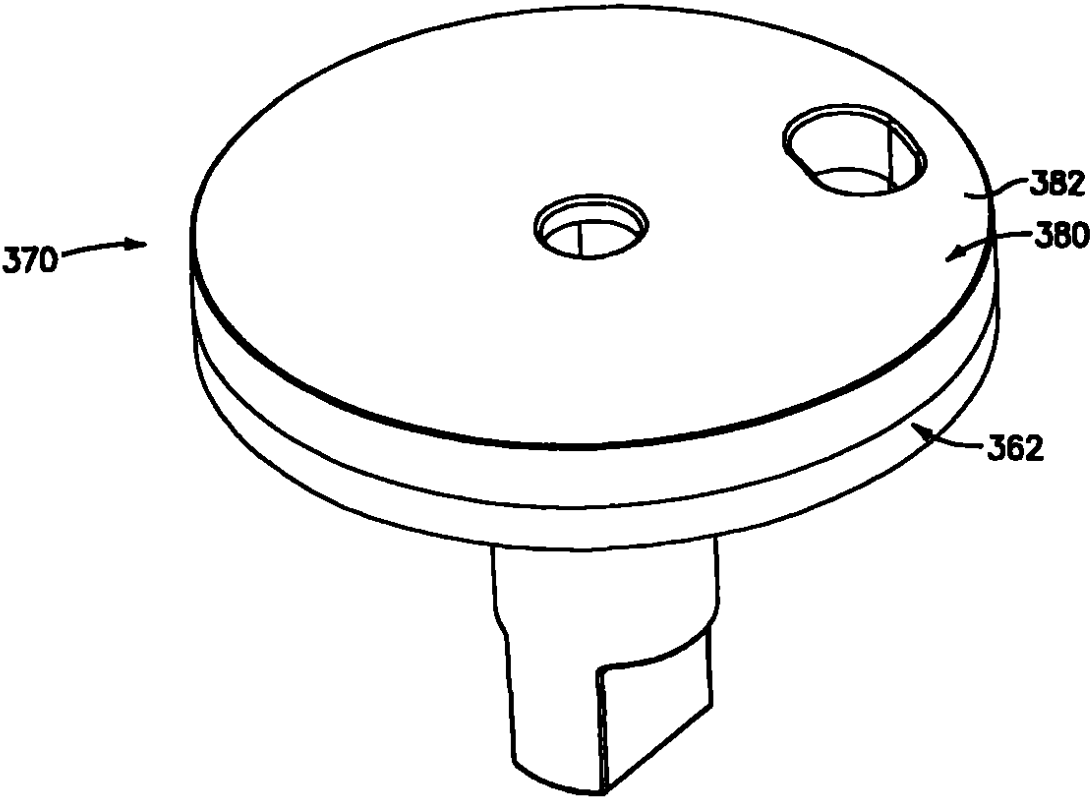


FIG. 20

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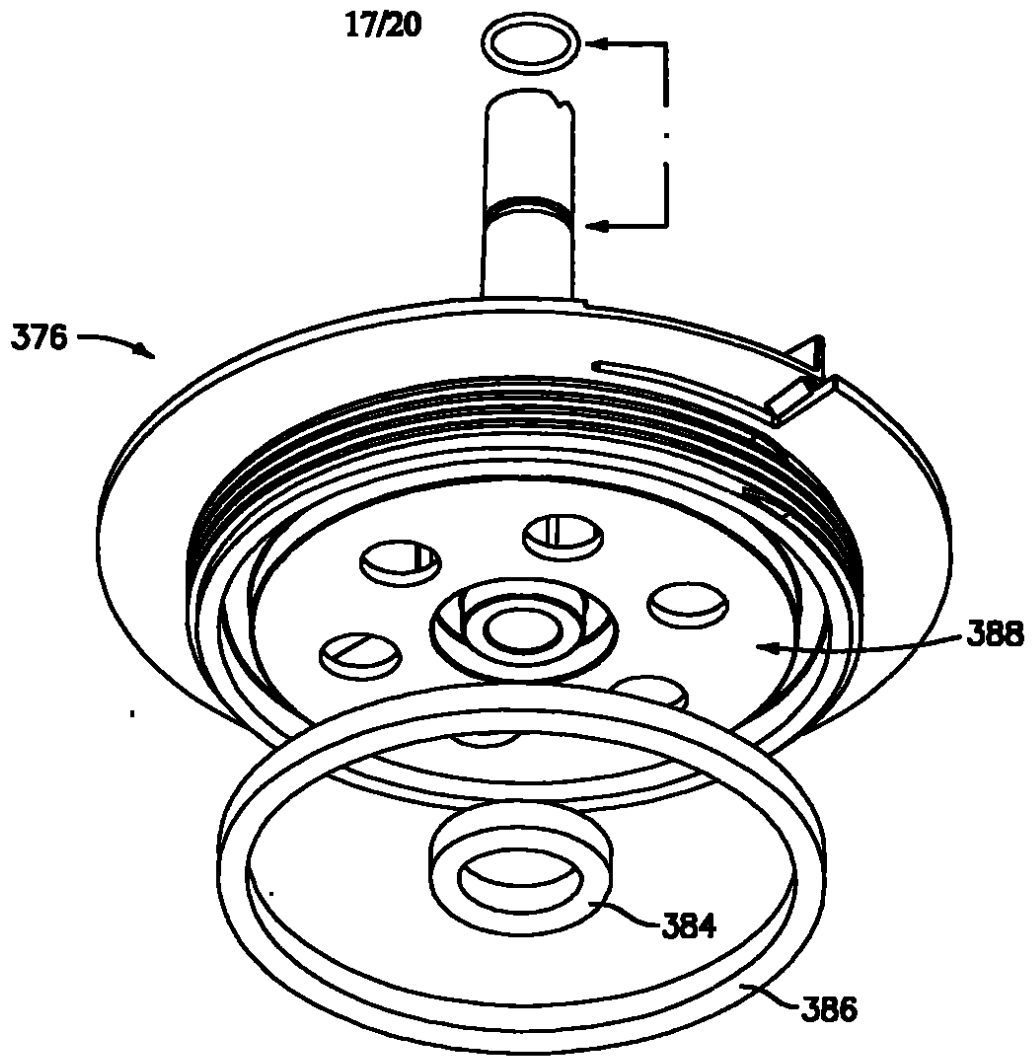


FIG. 21

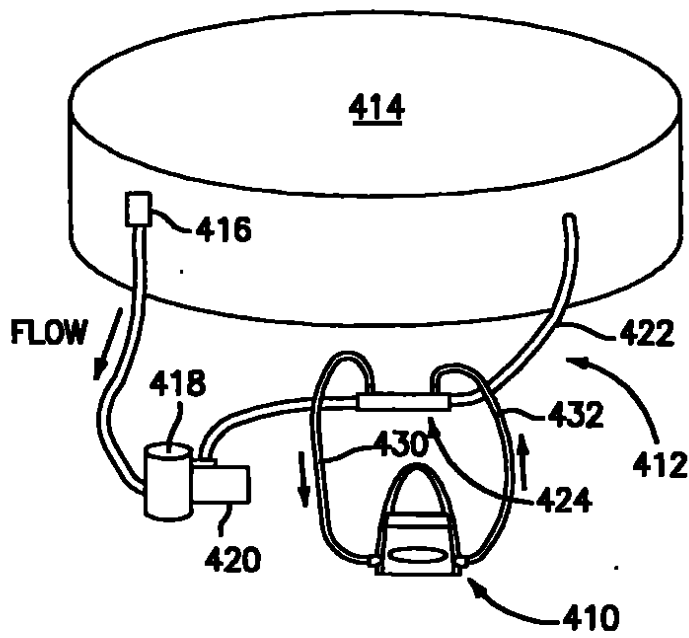


FIG. 22

33
X
M

18/20

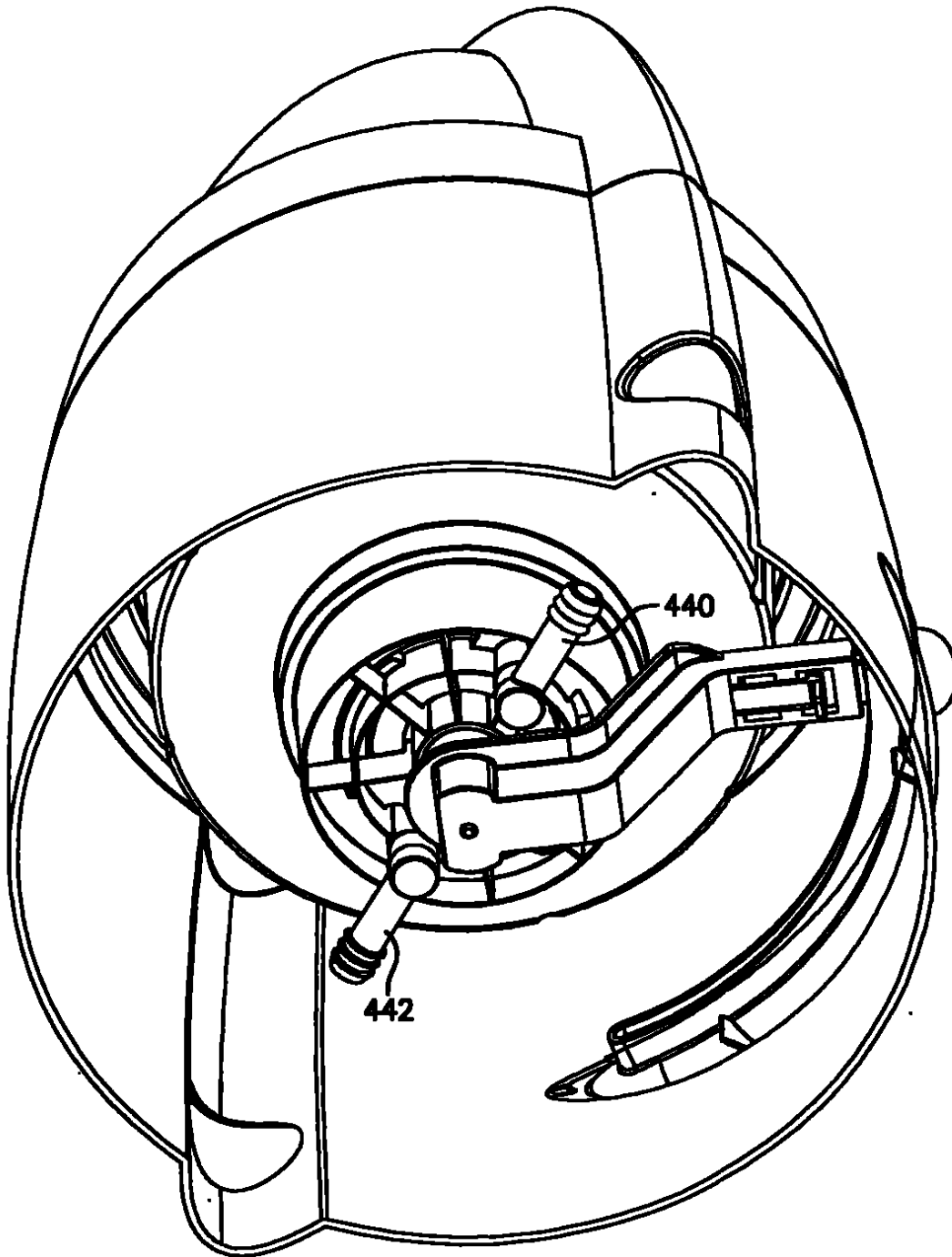


FIG. 23

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34

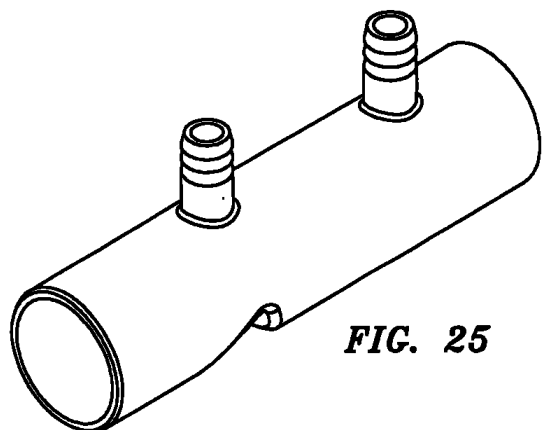


FIG. 25

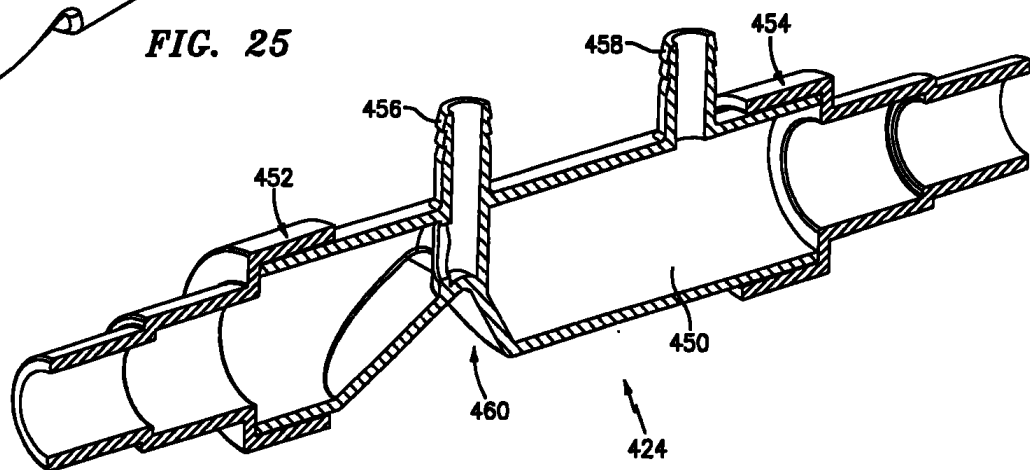


FIG. 24

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35 36

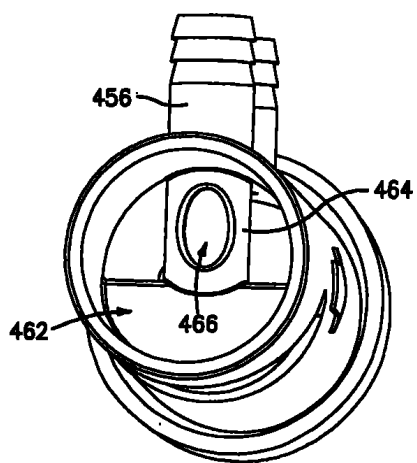


FIG. 26

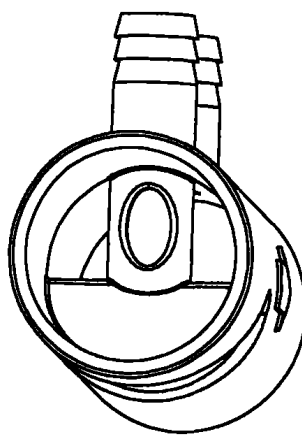


FIG. 27

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/38824

36

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B01D 11/02

US CL : 137/268; 422/278, 264

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 137/268; 422/278, 264, 277

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,765,945 A (PALMER) 16 June 1998 (16.06.1998), column 5, lines 14-60.	1, 2, 4, and 9
Y		3 and 17
A	US 5,536,479 A (MILLER et al) 16 July 1996 (16.07.1996), column 2, lines 54-64.	1

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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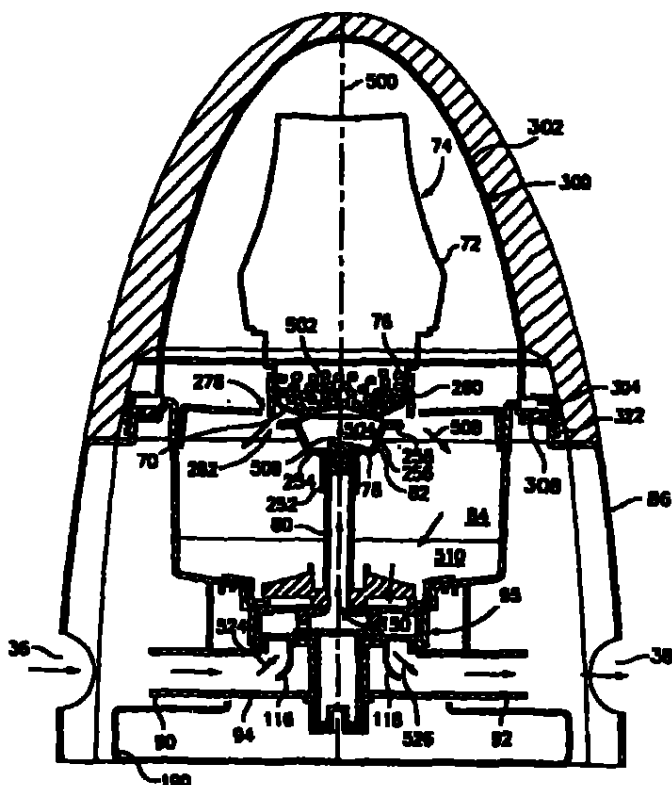
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(84) Título: DOSIFICADOR DE PRODUCTO QUÍMICO



(87) Extracto: Un dispositivo dosificador para introducir un producto químico en un flujo de agua incluye una entrada del dosificador (36) y una salida del dosificador (38), un depósito (74) del producto químico en forma sólida y que tiene una porción inferior provista de orificios (70), una primera tubería (80) que tiene una salida (78) y en comunicación con la entrada del dosificador (36) en por lo menos una primera condición del dosificador, una pared (82) que circunda la salida de la tubería (78) y que se proyecta hacia arriba de la misma, y una cámara de salida (84) que recibe el rebosamiento que contiene el producto químico disuelto y en comunicación con la salida del dispensador.

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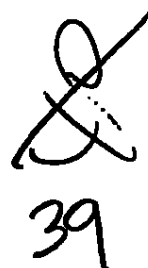
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DOSIFICADOR DE PRODUCTO QUÍMICO

ATECEDENTES DE LA INVENCION

(1) Campo de la Invención

Esta invención se relaciona con el tratamiento de agua y, más particularmente, con dosificadores para introducir productos químicos de tratamiento en una corriente de agua re-circulante, proveniente una piscina o similar.

(2) Breve Descripción del Arte

Si no se somete a tratamiento, el agua de piscina proporciona un punto de encuentro acogedor para el crecimiento de bacterias, algas, y otros organismos indeseables y potencialmente insalubres. En consecuencia, se ha vuelto una práctica común tratar el agua de piscina en forma periódica y continua con productos químicos de tratamiento para eliminar/controlar tales organismos.

Tal tratamiento se realiza normalmente mediante la introducción de cloro en el agua de piscina en niveles efectivos para eliminar o controlar los organismos indeseados. La fuente de cloro puede estar en forma líquida o puede estar en una forma sólida que se disuelve luego en el agua de la piscina. Entre las fuentes sólidas de cloro se encuentran hipoclorito de calcio (cal hypo), ácido dicloroisocianúrico (dicloro) y ácido tricloroisocianúrico (tricloro).

Existe una variedad de dosificadores para liberar cloro de tabletas químicas sólidas y similares. Se sabe de la utilización de un dispensador flotante de erosión, también conocido como "flotador" o "dosificador", para facilitar una liberación continua del producto químico. El flotador contiene el producto químico sólido y provee una exposición controlada del producto químico al agua de la piscina, el cual controla, a su vez, la velocidad con la que el producto químico sólido introduce cloro al agua de la piscina. Flotadores ejemplares se divulgan en la Patente de los Estados Unidos No: 4,917,868 y en las Patentes de Diseño de los Estados Unidos Nos. 297,857 y 309,493. Se conoce igualmente el bombeo del agua de

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piscina a través de un dosificador externo que puede incorporarse en un sistema de circulación, el cual facilita además la filtración del agua de la piscina. Entre tales sistemas se encuentran sistemas de rociado intermitente, sistemas de erosión y sistemas de inmersión periódica parcial. Ejemplos de tales sistemas se muestran en las Patentes de los Estados Unidos Nos. 5,932,093, 5,928,608, 5,441,711, 5,427,748, 5,419,355, 5,384,102, 5,133,381, y 4,208,376, y la Patente Reeditada de los Estados Unidos No. 33,861. Como antecedentes adicionales, las Patentes de los Estados Unidos Nos. 5,112,521 y 5,004,549 divulgan diversas composiciones de hipoclorito de calcio sólido.

La obtención de una disolución adecuada del producto químico de tratamiento y la prevención de depósitos indeseados o residuos han planteado problemas en el diseño del dosificador. Existen problemas particulares con el uso de gránulos de hipoclorito de calcio comercial, que producen depósitos de carbonato de calcio. Véase, por ejemplo, la Patente de los Estados Unidos No. 6,045,706.

BREVE SUMARIO DE LA INVENCION

Un aspecto de la presente invención se dirige a un dispositivo dosificador para introducir un producto químico en un flujo de agua que comprende: una entrada del dosificador y una salida del dosificador; un depósito del producto químico en forma sólida y que tiene una porción inferior provista de agujeros; una primera tubería que tiene una salida y en comunicación con la entrada del dosificador en por lo menos una primera condición del dosificador, que mantiene un cuerpo de agua en el cual se sumerge dicha salida de tubería; y una cámara de salida que, en por lo menos dicha primera condición del dosificador, recibe el rebosamiento que contiene el producto químico disuelto del cuerpo y que está en comunicación con la salida del dosificador.

Otro aspecto de la presente invención se dirige a un dispositivo dosificador para introducir un producto químico en un flujo de agua que

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comprende: una entrada del dosificador y una salida del dosificador; un depósito del producto químico en forma sólida y que tiene una porción inferior provista de agujeros; una primera tubería que tiene una salida y en comunicación con la entrada del dosificador en por lo menos una primera condición del dosificador; medios para mantener un cuerpo de agua en el cual se sumerge dicha salida de tubería en por lo menos dicha primera condición del dosificador; medios para modificar el flujo a través de la tubería con el fin de elevar localmente una superficie de dicho cuerpo entre: un primer nivel en dicha primera condición del dosificador, en el cual el cuerpo contacta el producto químico en el depósito para disolver tal producto químico; un segundo nivel en una segunda condición del dosificador en el cual el cuerpo no contacta el producto químico en el depósito, y medios para, en por lo menos dicha primera condición del dosificador, que dirige el flujo que contiene el producto químico disuelto desde el cuerpo a la salida del dosificador.

Aún otro aspecto de la presente invención se dirige a un dispositivo para introducir cloro de un producto químico de tratamiento de piscina, que lo contiene, en un flujo de agua a/desde una piscina que comprende: una entrada del dosificador que recibe agua del flujo; un depósito del producto químico en forma sólida y que tiene una porción inferior provista de agujeros; una primera tubería que tiene una salida y en comunicación con la entrada del dosificador en por lo menos una primera condición del dosificador; una pared que circunda la salida de la tubería y que se proyecta hacia arriba de la misma y, en por lo menos dicha primera condición del dosificador, mantiene un cuerpo de agua en el cual está sumergida dicha salida de tubería, descargando agua la primera tubería en dicha primera condición del dosificador a través de la salida de la tubería a una rata y velocidad efectivas para elevar localmente una primera porción de superficie del cuerpo en una altura de entre 0.125 pulgadas y 1.0 pulgadas por encima de otra porción de superficie del cuerpo, de modo que la primera porción de superficie contacte el producto químico para disolver el producto químico; una cámara de salida que en por lo menos dicha

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primera condición del dosificador recibe dicho producto químico disuelto; y una salida del dosificador que devuelve al flujo dicho producto químico disuelto.

Y todavía otro aspecto de la presente invención se dirige a un método para introducir un producto químico de tratamiento en un cuerpo de agua a una rata controlada, que comprende los actos de: proveer un dosificador que tiene una entrada, una salida, y que contiene un producto químico sólido en un depósito para el producto químico; hacer que un flujo de agua proveniente del cuerpo entre al dosificador a través de la entrada y salga a través de la salida para regresar al cuerpo, de manera que accione el dosificador en por lo menos una primera condición de estado permanente en donde: por lo menos una primera porción del flujo se dirige a través de una salida de tubería en un primer cuerpo de agua, con el fin de producir por lo menos una elevación local de una porción de una superficie de ese primer cuerpo, contactando la elevación local una porción inferior provista de agujeros de un depósito de dicho producto químico de tratamiento en forma sólida con el fin de disolver dicho producto químico de tratamiento; y dicho producto químico de tratamiento, disuelto, se dirige a dicha salida; y restringir por lo menos dicha primera porción de flujo con el fin de desconectar del depósito el primer cuerpo de agua y hacer que el dosificador entre por lo menos a una segunda condición de estado permanente.

Y aún otro aspecto de la presente invención se dirige a un recipiente para producto químico en una condición instalada sobre un receptáculo de un dosificador de producto químico y que comprende: dicho producto químico, que contiene en la mayor parte hipoclorito de calcio; un cuerpo plástico moldeado que contiene el producto químico y que tiene: un extremo inferior abierto; un extremo superior cerrado; y una porción de rosca externa próxima al extremo inferior en engrane roscado a una porción complementaria, de rosca interna, del receptáculo; y una tapa provista de agujeros que se proyecta a través de la boca del recipiente y que sostiene por lo menos parcialmente el producto químico y que tiene una porción

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central sumergida en una porción central, elevada localmente, de un cuerpo de agua.

Los detalles de una o más incorporaciones de la invención se exponen en los dibujos acompañantes y la descripción que siguen. Otras características, objetos y ventajas de la invención serán evidentes de la descripción y los dibujos, así como de las reivindicaciones.

BREVE DESCRIPCIÓN DE LOS DIBUJOS

FIG. 1 es un diagrama de un sistema ejemplar de circulación de piscina.

FIG. 2 es una vista de corte semi-esquemática, parcial, de una sección cloradora de un dosificador.

FIG. 3 es una vista frontal de un dosificador.

FIG. 4 es una vista lateral del dosificador de FIG. 3.

FIG. 5 es una vista de corte vertical del dosificador de FIG. 4.

FIGS. 6 y 7 son vistas de un múltiple del dosificador de FIG. 3.

FIG. 8 es una vista de un lado inferior de una base del dosificador de FIG. 3.

FIG. 9 es una vista de un elemento de válvula del dosificador de FIG. 3.

FIG. 10 es una axonometría explotada del elemento de válvula de FIG. 9.

FIG. 11 es una vista de una cámara de descarga en la base del dosificador de FIG. 3.

FIG. 12 es una vista del lado inferior del dosificador de FIG. 3.

FIG. 13 es una vista de la cámara de salida del dosificador de FIG. 3.

FIG. 14 es una axonometría explotada de una porción del dosificador de FIG. 3.

FIG. 15 es una vista del lado inferior de una tapa para la base del dosificador de FIG. 3.

FIG. 16 es una axonometría explotada de un recipiente de un producto químico de tratamiento para el dosificador de FIG. 3.

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FIG. 17 es una axonometría explotada del dosificador de FIG. 3.

FIG. 18 es una vista de una brida inferior del elemento de válvula alternativo.

FIGS. 19 y 20 son vistas de elemento de válvula alternativo que incluye la brida inferior de FIG. 18.

FIG. 21 es una axonometría explotada parcialmente de un ensamble de tubería para uso con el elemento de válvula de FIGS. 19 y 20.

FIG. 22 es un diagrama de sistema de circulación de piscina, ejemplar y alterno.

FIG. 23 es una vista de un lado inferior de una base de un dosificador alterno.

FIGS. 24 y 25 son vistas de múltiples primero y segundo, útiles en el sistema de circulación de FIG. 22.

FIGS. 26 y 27 son vistas de los múltiples de FIGS. 24 y 25.

Números de referencia y designaciones similares en los diferentes dibujos indican elementos similares.

DESCRIPCIÓN DETALLADA

FIG. 1 muestra una piscina 20 que contiene un cuerpo de agua 22 y asociada con un sistema de circulación 24. La piscina ejemplar es del tipo de piscina sobre la superficie del suelo, aunque esto no debe considerarse como limitante. El sistema de circulación tiene tubería de salida de la piscina 26 que extrae agua de la piscina y una tubería de retorno a la piscina 28 que devuelve el agua a la piscina. El flujo a través de estas tuberías se induce por una bomba 30 con un lado de baja presión (succión) hacia la tubería de salida de la piscina y un lado de alta presión hacia la tubería de retorno a la piscina. Corriente abajo de la bomba, puede haber un sistema de filtro 32 que retiene los desechos y similares del agua, que fluye de la bomba, y un dosificador o clorador 34 que introduce cloro al flujo. El dosificador tiene una entrada y una salida, respectivamente, indicadas como 36 y 38. Alternativamente, puede utilizarse un múltiple en línea en lugar del dosificador 34. En ese caso, un dosificador o clorador 34 se conectaría

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al múltiple en forma fuera de línea.

FIG. 2 muestra en forma semi-esquemática un ejemplo de ciertos aspectos de los dosificadores inventivos. Dentro de un dosificador, se encuentra un producto químico sólido de tratamiento de agua 40 en un depósito 42 que tiene una porción inferior provista de agujeros 44. El depósito se halla encima de una estructura de pared o porción de la misma 46 que contiene un cuerpo de agua 48. El agua entra al cuerpo 48 a través de una tubería 50 que tiene una salida o boquilla 52. La salida o boquilla 52 está sumergida en el cuerpo 48. La salida 52 se dimensiona de tal manera que el agua 54, que fluye a través de ella, tenga una velocidad suficiente para producir una elevación local sustancial u onda estacionaria central 56 en la superficie del agua en el cuerpo. La elevación u onda estacionaria 56 es lo suficientemente alta para penetrar la porción provista de agujeros 44 y entrar en contacto con el producto químico 40. Este contacto permite la disolución del producto químico que entra al cuerpo 48.

Ventajosamente, una porción periférica 58 de la superficie del cuerpo se encuentra en un nivel sustancialmente inferior a la elevación 56, un nivel por debajo de la porción provista de agujeros 44. El nivel de la porción 58 puede estar ligeramente por encima del nivel de un reborde de la estructura de pared 46 o de aperturas discretas de desagüe, practicadas en ella en razón de la tensión superficial del cuerpo de agua. El rebosamiento 60 proveniente del cuerpo se produce sobre dicho reborde o a través de tales aperturas de desagüe y puede estar en un segundo cuerpo 62 contenido, por ejemplo, por una estructura de pared 64 que circunda la tubería 50. Una apertura de desagüe 66 puede pasar un flujo de desagüe 68 de agua que contenga producto químico disuelto el cual, a su vez, puede dirigirse a una salida del dosificador o puede formar ella misma la salida del dosificador. La apertura de desagüe se localiza ventajosamente próxima a la porción más baja del segundo cuerpo de agua 62, para permitir un desagüe sustancialmente completo de tal cuerpo.

Cuando el dosificador no está en funcionamiento (tal como cuando se bloquea el flujo a través de la tubería 50), la estructura de pared 46

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puede, sujeto a evaporación, retener el cuerpo de agua 48 y mantener tapada la salida 52. No obstante, en ausencia del flujo 54, no habrá elevación 56 y el producto químico 40 se desconectará completamente del cuerpo 48. Aunque puede disponerse un desagüe adicional (por ejemplo, una apertura muy pequeña) en la estructura de pared 46 para drenar el cuerpo de agua 48 en la condición "off", ventajosamente no hay tal desagüe. El mantenimiento del cuerpo 48 durante un intervalo "off" es ventajoso para minimizar la alteración cuando se vuelva a poner en marcha. Específicamente, en la ausencia del cuerpo de agua 48, a menos que se adopten otras medidas, cuando se vuelva a poner en marcha, el flujo 54 formaría un chorro disparado directamente a la porción provista de agujeros 44 y el producto químico 40, alterando el producto químico y generando una rata de disolución inicial demasiado alta. Ventajosamente, la profundidad de la salida 52 por debajo de la superficie del cuerpo 48 en la condición "off" es efectiva para amortiguar tal chorro de manera que, cuando se restablezca el flujo del dosificador, la porción elevada se transforme más suavemente en una onda o forma de porción elevada.

FIGS. 3-5 muestran mayores detalles de una incorporación del dosificador 34. En las Figuras 3 y 4, la sección cloradora superior 35 y la porción del cuerpo inferior o base 86 del dosificador, una abertura de un controlador de flujo 37 con una perilla de control 39 ajusta el flujo de agua a través del dosificador desde una posición off/desagüe hasta un caudal máximo. Se muestran asimismo la entrada de flujo de agua al dosificador 36 y la salida de flujo de agua 38. En la FIG. 5, el dosificador ejemplar tiene un eje vertical central 500 y se muestra en una condición "on". En la sección cloradora superior del dosificador, una elevación central 502 de la superficie de un cuerpo de agua disolvente 504 penetra una tapa provista de agujeros 70, asegurada alrededor de la boca de un cuerpo 72 de un recipiente de depósito 74 que contiene el producto químico 76. Las briquetas de producto químico ejemplar están constituidas en un 65% en peso por hipoclorito de calcio obtenible de Arch Chemicals, Inc., Charleston, TN y pesan aproximadamente 7 gramos por unidad y tienen

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32mm de largo, 19mm de ancho y 13mm de espesor.

Sumergida en el cuerpo 504 se encuentra una boquilla de impulsor plano 78 que expelle un flujo de salida 506. A manera de referencia de tamaño, la boquilla puede tener dimensiones efectivas para transportar un caudal de agua de entre 0.2 y 2 gpm a una presión de 5 psi; no obstante, el dosificador puede operarse o no a tal presión específica. Una boquilla ejemplar es un impulsor plano de 50° disponible de Lechler, Inc. de St. Charles, Illinois como modelo 632.884.5E.BC. La boquilla 78 se asegura al extremo superior de una tubería 80 como es una estructura de pared 82 que contiene el cuerpo 504. Alternativamente, la boquilla puede moldearse en el extremo superior de la tubería 80 y es el mismo material de la tubería 80. El rebosamiento 508 del cuerpo 504 cae en una cámara de salida 84 dentro de una porción del cuerpo inferior o base 86 del dosificador.

La base ejemplar comprende un miembro principal formado, por ejemplo, como una moldura unitaria de un polímero (por ejemplo, policarbonato). En el fondo de la cámara de salida se halla un segundo cuerpo o cuerpo de salida de agua 510 que circunda la tubería 80.

La entrada y salida del dosificador 36 y 38 se asocian respectivamente con las porciones finales primera y segunda 90 y 92 de un múltiple 94. Estas porciones finales ejemplares son tubulares para empalmar con las tuberías del sistema de circulación. Como se describe con mayor detalle a continuación, el múltiple sirve para recibir el agua de entrada, dirigir por lo menos una porción de tal agua de entrada hacia la sección cloradora del dosificador, recibir el agua clorada de la sección cloradora, y descargar el agua clorada hacia la piscina. Interpuesta entre el múltiple, de un lado, y la tubería 80 y la cámara de salida 84, del otro, se encuentra una estructura de válvula 95 que regula los flujos ascendentes en la tubería y los descendentes de la cámara de salida.

El múltiple (FIGS. 6 y 7) está formado con una pared central, proyectada verticalmente 98 que delimita una abertura central 96 alrededor del eje 500. La abertura 96 permite el paso de un eje de impulsión de una válvula, tal como se describe a continuación. Una pared exterior 100 del

múltiple se distancia de la pared interna 98 permitiendo la comunicación desde la entrada a la salida a través de los espacios entre las paredes 98 y 100. El múltiple incluye un par de áreas abiertas en forma ascendente 102 y 104, respectivamente, hacia los lados de entrada y salida desde el eje central y la pared 98. Estas áreas abiertas permiten una desviación de una porción del agua que fluye a través del dosificador hacia/desde la sección cloradora. En una incorporación ejemplar, los flujos de entrada y salida del dosificador 520 y 522 son idénticos y cercanos a 20-40 galones por minuto (gpm). Los flujos desviados 524 y 526 hacia/desde la sección cloradora pueden ser cercanos a 0.2-0.6 gpm, con un flujo de desviación 528 que pasa entre las paredes 98 y 100, de manera que rodee la sección cloradora, representando la diferencia.

El múltiple ejemplar se moldea de un polímero tal como policarbonato. El múltiple ejemplar se moldea con un par de soportes de montaje 106 que se proyectan hacia arriba desde las porciones tubulares de entrada y salida respectivas y que tienen superficies superiores para acoplarse a una cara inferior de la base 86, a la cual pueden asegurarse tal como mediante soldadura ultrasónica. La porción complementaria del lado inferior de la base (FIG. 8) comprende dos juegos de costillas de montaje 107 en una porción de la base que define una pared de fondo de la cámara de salida. Entre éstos se encuentra un compartimento para el elemento de válvula, empotrado, generalmente cilíndrico 108. En el fondo del compartimento se encuentra una rejilla central, generalmente horizontal 110 que tiene una abertura 112 de tamaño similar a la apertura del múltiple 96 de FIG. 6. Cuando se encuentra ensamblado, el reborde de la pared 98 encaja en forma hermética en la rejilla 110 para alinear las aberturas 96 y 112. La pared 100 y las prolongaciones de la misma, que circundan las áreas abiertas 102 y 104, encajan análogamente en forma hermética en la rejilla. Un par de cucharas de entrada y salida 116 y 118 (FIGS. 5 y 8) penden de la rejilla y penetran las áreas abiertas del múltiple cuando se encuentra ensamblado. Las cucharas 116 y 118 guían los flujos respectivos 524 y 526 (FIG. 5) hacia arriba, a través de la rejilla desde la entrada del

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múltiple 90, y hacia abajo, a través de la rejilla hacia la salida del múltiple 92, respectivamente.

En la incorporación ejemplar, los flujos 524 y 526 se producen respectivamente desde/hacia la sección cloradora a través de la estructura de válvula 95. La estructura de válvula incluye un elemento de válvula 130 (FIGS. 9 y 10) que comprende por lo general una porción cilíndrica hueca formada por bridas superiores e inferiores 132 y 134, las cuales, cuando se encuentran ensambladas, forman la pared lateral 136. En la incorporación ejemplar, la brida superior 132 se moldea unitariamente de un polímero tal como polietileno de baja densidad (LDPE), mientras que la brida inferior 134 se moldea análogamente (por ejemplo, de LDPE), y se aseguran en forma hermética entre sí mediante soldadura de placa caliente. El elemento de válvula se forma teniendo puertos primero y segundo 138 y 140 (FIG. 10) en la brida inferior, y puertos primero y segundo 142 y 144 en la brida superior. El primer puerto 142 en la brida superior se localiza centralmente y se alinea con un puerto de entrada inferior 150 (FIG. 5) a la tubería 80. El primer puerto 138 en la brida inferior está distanciado del eje 500 de manera que, con la válvula en una orientación "on", se alinea con la cuchara de entrada para recibir un flujo de entrada. Los puertos primeros de las bridas superior e inferior están en estrecha comunicación entre sí mediante el interior del elemento de válvula. Los segundos puertos de las bridas superior e inferior están distanciados del eje 500, opuestos diametralmente al primer puerto de la brida inferior. Los segundos puertos están en estrecha comunicación entre sí a través de una porción de manguito 152 suspendida de la brida superior. En las orientaciones "on", asociadas con las condiciones "on", los segundos puertos se encuentran por lo menos parcialmente alineados con la cuchara de salida 118 para permitir el flujo 526 a través de tales segundos puertos y la cuchara. De igual manera, el primer puerto de la brida inferior se alinea análogamente con la cuchara de entrada 116 para permitir el flujo 524. En consecuencia, los puertos primero y segundo de la brida inferior sirven respectivamente como puertos de entrada y salida para el elemento de válvula, y las cucharas 116 y 118

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sirven como puertos de entrada y salida para la sección cloradora superpuesta. Una empaquetadura 154 (FIG. 11) sella la brida inferior a la superficie superior de la rejilla del cuerpo. La empaquetadura incluye allí porciones concéntricas interior y exterior, alineadas con las cucharas y con una abertura de desagüe o puerto 158 en la rejilla, de la cual pende un manguito 160 (descrito con mayor detalle a continuación).

Un eje de impulsión 170 (FIGS. 9 y 10) pende del elemento de válvula y se asegura a él, con el fin de controlar la rotación del elemento de válvula. El eje ejemplar 170 (FIG. 10) tiene una brida superior de montaje 172 para empalmar con la brida inferior del elemento de válvula 134. Para evitar la rotación relativa, una pluralidad de postes 173 se eleva de la brida de montaje y se aloja en receptáculos complementarios 175 en la brida inferior del elemento de válvula 134. En su extremo inferior, el eje incluye una porción entallada u otra estructura para encajar en una estructura complementaria de un extremo próximo de una palanca o brazo de control 180 (FIG. 12). El eje pasa a través de la abertura central del múltiple. Al mover el usuario una perilla en el extremo distal de la palanca 180, el elemento de válvula rota alrededor del eje 500 recorriendo una pluralidad de orientaciones. Como se anotó más arriba, en una serie de orientaciones "on", los puertos 138 y 140 se alinean con las cucharas 116 y 118. El grado de alineación puede facilitar un ajuste del caudal, como una superposición parcial de los puertos 138 y 140 con respecto a las cucharas 116 y 118 proporciona un flujo restringido en cierta forma. En la incorporación ejemplar, el puerto de salida 140 es relativamente alargado en la dirección radial, como una ranura generalmente curvada. El puerto de entrada 138 es una serie de huecos pequeños para facilitar que, en las condiciones restringidas, el flujo de entrada se limite más que el flujo de salida para evitar la acumulación indeseada de agua. Practicando esta serie de huecos, se disminuye la sensibilidad, haciendo más fácil para el usuario ajustar el flujo a través de la sección cloradora y, con ello, la tasa de alimentación. En todavía otra orientación, una orientación "off/desagüe", el puerto 140 se alinea con el manguito de desagüe 160 y el puerto 138 es completamente

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bloqueado por la rejilla. En esta condición, no hay sustancialmente flujo a través de las cucharas 116 y 118. En su lugar, el flujo de desagüe puede pasar a través del elemento de válvula y a través del manguito 160 y a una cazoleta de desagüe 190 (FIG. 5).

Encima del elemento de válvula, la tubería ejemplar 80 (FIG. 13) se forma principalmente por una porción tubular o tubo 200 de una estructura moldeada unitariamente (por ejemplo, de policarbonato) 202. La salida de la tubería ejemplar es provista por la boquilla 78 que puede roscarse en un extremo superior de rosca interna del tubo 200. En el extremo inferior del tubo, una brida 204 puede proyectarse radialmente hacia afuera y puede proveerse con costillas estructurales de refuerzo 206 y aberturas 208 (discutidas a continuación). Un paso en la brida se proyecta verticalmente hacia arriba y tiene una porción exterior de rosca interna 212 (FIG. 14). En la parte superior de la porción 212, la brida se prolonga hacia afuera en un reborde 214. En por lo menos un punto del perímetro del reborde, la brida se forma con una porción de trinquete 216 definida por una ranura 218 que dispone de porciones radiales y circunferenciales intersectadas. La estructura 202 se aloja en una porción superior del compartimento de válvula 108, inmediatamente encima del elemento de válvula. La porción roscada 212 se aloja en una porción roscada complementaria 220 (FIG. 11), formada por un paso en la pared del compartimento de válvula. Alternativamente, la brida 204 puede asegurarse a la base 86 mediante pernos de plástico (PVC) en lugar de la estructura roscada. Cuando se encuentra ensamblado, y atornillado en su sitio, una uña 224 del trinquete 216 engrana en una de una pluralidad de surcos de parada 226 en la superficie superior de la pared del fondo de la cámara de salida para asegurar angularmente la estructura 202 y mantenerla en su sitio. Cuando se asegura en esa forma, la cara inferior de la brida 204 sienta sobre anillos en "o" interno y externo 230 y 232 (FIG. 17), alojados en canales en la superficie superior de la brida superior del elemento de válvula (FIG. 14). Los anillos en "o" sellan respectivamente las vías de flujo de entrada y salida, y la estructura cierra herméticamente en el compartimento de la

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válvula hasta un punto en donde una de sus aberturas 208 se alinea con la cuchara de salida, mientras que la otra se alinea con el manguito de desagüe para facilitar los flujos de salida y desagüe, respectivamente.

En la incorporación ejemplar, el miembro moldeado de tapa de la cámara de salida 250 (FIG. 14) cumple múltiples funciones, incluyendo proveer, en una porción central, la estructura de pared 82 (FIG. 5) que define la cámara de disolución. Una porción tubular central 252 del miembro descansa en el extremo inferior de la estructura de pared 82 y aloja un extremo superior de la tubería 80 y se encuentra asegurada herméticamente a ella mediante un anillo en "o", que va montado en un surco en la tubería. La estructura de pared 82 incluye una porción de la primera brida 254 que se proyecta radialmente hacia afuera desde un extremo superior de la porción tubular 252, y una primera porción cónica recortada 256 que se proyecta hacia arriba y radialmente hacia fuera del extremo superior/externo de la porción 254. Una porción de la segunda brida 258 se prolonga radialmente hacia fuera del extremo superior/exterior de la porción 256. Una segunda porción cónica recortada 260 se proyecta hacia arriba y hacia afuera del extremo exterior de la porción 258. La porción ejemplar 260 posee una pluralidad de aberturas 262 que permiten el rebosamiento de la cámara de disolución a la cámara de salida. En el extremo superior de la porción 260, una brida superior 264 (FIGS. 14 y 15) se proyecta radialmente hacia fuera, y una porción de collarín de rosca interna 266 continúa proyectándose hacia arriba. Con la estructura de tubería 202 instalada en el cuerpo, el miembro de tapa de la cámara de salida 250 se coloca hacia abajo sobre ella para instalarla.

En dos puntos ejemplares a lo largo del perímetro de la brida superior, penden un par de trinquetes 270 (*FIG. 14). Proyecciones de los trinquetes 270 engranan en surcos complementarios 272 en la pared lateral de la cámara de salida. Uno o más canales 274 en el perímetro de la brida superior engranan en costillas verticales complementarias 276 en la pared lateral de la cámara de salida para ubicar angularmente el miembro 250. Aberturas 278 cerca de la base del collarín 266 y la raíz de la brida superior

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264 permiten el desagüe de cualquier agua que se acumule sobre la brida superior. El collarín de rosca interna aloja una porción de rosca externa, complementaria, de un recipiente para el producto químico de tratamiento que hace las veces de un depósito.

FIG. 16 muestra detalles adicionales del recipiente ejemplar 74 que incluye la tapa provista de agujeros 70 (por ejemplo, moldeada de HDPE), el cuerpo 72 (por ejemplo, moldeado de HDPE), y una caperuza para facilitar el despacho/almacenamiento o tapa 271 que se retira antes de la instalación del recipiente en el dosificador. La tapa ejemplar 271 puede engranar los mismos hilos externos en el cuerpo 72 usados para montar el recipiente al dosificador.

En una incorporación ejemplar, la tapa del dosificador 300 (FIG. 5) se asegura encima de la base del dosificador que encierra el recipiente del producto químico y que circunda un espacio de cabeza de la cámara de salida. La tapa ejemplar se moldea de un material plástico tal como policarbonato y es, en forma ventajosa, sustancialmente transparente, aunque preferiblemente puede ser polarizada. La tapa ejemplar incluye una cúpula aproximadamente paraboloide 302 que termina en una brida que se proyecta radialmente hacia afuera 304. Un anillo en "o" 306, alojado dentro de un canal anular en un reborde de la base del dosificador, sella la tapa a la base. Para mantener un acople integral entre la brida 304 y la base, se provee un miembro de cierre 320 (FIG. 17). El miembro de cierre ejemplar incluye una primera porción de anillo de cierre de rosca interna 322 y una agarradera 324 que se proyecta hacia arriba desde puntos diametralmente opuestos sobre el anillo. El miembro ejemplar 320 se moldea unitariamente de un polímero (por ejemplo, policarbonato). El anillo 322 se dimensiona para ajustar sobre la brida 304 con un hombro interno, orientado hacia abajo, del anillo que engrana una superficie superior de la brida. El anillo 322 se atornilla a la porción de rosca externa del reborde en la parte externa del anillo en "o" 306 para presionar la brida 304 contra el anillo en "o". La agarradera 324 se dimensiona para cubrir en arco la cúpula 302 cuando se instala en esa forma.

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En operación de la incorporación ejemplar, en una condición "on", un flujo principal a través del dosificador ocurre a través de la entrada del múltiple a la salida del múltiple, sin pasar a través de la sección cloradora. Una porción relativamente pequeña del flujo de entrada se desvía por la cuchara de entrada a la sección cloradora (siendo ajustable la proporción exacta mediante la rotación del elemento de válvula). El flujo desviado se produce hacia arriba a través del elemento de válvula y la tubería en la cámara de disolución y, mediante la elevación de la superficie del mismo, en el depósito del producto químico. El rebosamiento de la cámara de disolución contiene producto químico de tratamiento disuelto y se produce a través de las aberturas 262 para caer en la cámara de salida. Las porciones intactas de la pared 260 entre las aberturas 262 se consideran ventajosas para formar ondas reflejadas, que tienden a cancelar las ondas incidentes. Esto puede proveer un perfil de superficie más estable a lo largo de la elevación con una elevación central única u onda 502 en el cuerpo de agua 504.

De la cámara de salida, el agua desviada fluye a través del elemento de válvula y la cuchara de salida para reencontrar el flujo principal que sale del múltiple. A medida que el producto químico en el recipiente se disuelve y disminuye, el producto químico restante caerá hacia abajo. El cuerpo cerrado del recipiente tenderá a llenarse con aire del espacio de cabeza de la cámara de salida, con el fin de llenar el espacio liberado por la pila descendente del producto químico de tratamiento. A medida que esto ocurre, el nivel de agua en la cámara de salida aumentará gradualmente en la forma correspondiente. Sellando el espacio de cabeza y, con ello, conservando en gran medida la cantidad de aire presente, la tapa 300 contribuye a evitar que el nivel de agua en la cámara de salida aumente demasiado. Ventajosamente, el nivel de agua en la cámara de salida se mantiene bien por debajo del producto químico en el recipiente, preferiblemente, a cierta altura intermedia a lo largo de la tubería 80. En operación, el espacio de cabeza se mantiene a una presión elevada, por ejemplo, 0-8 psig y, típicamente 3-4 psig. El cuerpo y la tapa son

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suficientemente robustos para resistir todas las presiones de operación con un margen de seguridad. Ventajosamente, esto incluye resistir una presión de espacio de cabeza de hasta 10 psig.

El dosificador puede ponerse en la condición "off", por ejemplo, con el fin de reemplazar el recipiente o simplemente cuando no se desea agregar producto químico al flujo. Para hacer esto, el usuario simplemente gira el elemento de válvula a la posición "off". En esta posición, la totalidad del flujo a través del puerto de entrada 90 se dirige a través del puerto de salida 92 sin pasar a través de la sección cloradora. En esta condición, la cámara de salida puede desaguar a través del elemento de válvula en la cazoleta de desagüe 190. El miembro de cierre de la tapa 320 puede quitarse desatornillándolo y entonces la tapa 300 puede retirarse. En este punto, el recipiente 74 puede desatornillarse y reemplazarse. Seguidamente la tapa 300 y el miembro de cierre 320 pueden reemplazarse, y devolverse el dosificador a la condición "on" deseada.

En una variación secundaria de este sistema, sustancialmente todo el flujo a través del dosificador puede dirigirse a través de la sección cloradora en la condición "on". Esto puede ser particularmente relevante para uso en una disposición en la que el dosificador no se localice en la vía de flujo primario del sistema de circulación, pero se ubica en tal forma que únicamente una pequeña desviación del flujo total a través del sistema de circulación pasa a través del dosificador.

FIG. 18 muestra detalles de una dosificador alterno 360 que puede ser muy similar a la base 86. Al igual que la base 86, la base 360 puede incluir un elemento de válvula. Este elemento de válvula puede diferir del elemento 130 en la construcción de su brida inferior 362. Esta brida inferior incluye un arreglo de aberturas que sirven como su primer puerto. FIG. 18 muestra un arreglo único aproximadamente circunferencial de aberturas que se proyectan desde una primera abertura 364 a lo largo de una pluralidad de aberturas intermedias 366 hasta una última abertura 368. En la serie de orientaciones "on" para este elemento de válvula, una a todas de estas aberturas se alinean con el puerto de entrada del cuerpo del

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dosificador situado allí debajo. En una implementación ejemplar, la primera abertura 364 tiene 0.055 pulgadas de diámetro y las aberturas restantes 366 tienen 0.033 pulgadas de diámetro y están espaciadas a incrementos de 5° alrededor del eje del elemento de válvula. La primera abertura 364 está dimensionada para iniciar un flujo básico de alrededor de 0.15 galones por minuto. Las aberturas restantes 366 incrementan en forma escalonada este flujo. Opcionalmente, una abertura final 368 puede ser relativamente amplia para proveer un incremento final grande, con el fin de establecer un caudal particularmente alto en un modo de tratamiento de choque.

FIGS. 19 y 20 muestran un elemento de válvula 370 que incluye la brida inferior 362. La brida inferior posee una proyección chaveteada 372 (FIG. 19) que encaja dentro de un canal 374 (FIG. 11) para limitar el rango de rotación del elemento.

Una segunda diferencia entre el elemento 370 y el elemento 130 se asocia con una diferencia entre la estructura unitaria de la tubería 376 (FIG. 21) y la estructura 202 de FIG. 13. Específicamente, la brida superior 380 del elemento 370 tiene una superficie superior plana 382 para sentar sobre anillos en "o" interno y externo 384 y 386 (FIG. 21) (por ejemplo, formados de fluoroelastómero VITON (DuPont Dow Elastomers L.L.C., Wilmington, Delaware) con PTFE y grafito). Estos anillos en "o" se forman con una sección que semeja un semicírculo encima de un rectángulo, con la porción rectangular alojada en canales abiertos hacia adentro en la superficie inferior de una porción de brida 388 de la estructura 376). Además, en la estructura ejemplar 376, la boquilla se incorpora unitariamente, en lugar de ser una pieza separada.

FIG. 22 muestra un dosificador 410, asociado con un sistema de circulación 412 hacia/desde una piscina 414. El flujo principal hacia/desde la piscina se produce inicialmente a través de una cámara colectora de espuma 416 a través de una trampa de pelo y pelusa 418 a una bomba 420 y regresa de allí a la piscina en una línea de retorno 422. Un desviador 424 viene montado en la línea de retorno 422 y tiene líneas primera y segunda

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430 y 432 que van respectivamente hacia y desde el dosificador 410 (FIG. 22). Las líneas primera y segunda empalman con las conexiones primera y segunda 440 y 442 (FIG. 23) montadas en el lado inferior de la base del dosificador (FIG. 23) y que reemplazan el múltiple y las cucharas del dosificador 34.

FIG. 24 muestra el desviador 424. El desviador tiene un cuerpo moldeado de una pieza, generalmente cilíndrico 450 que se proyecta desde un extremo de la entrada corriente arriba hasta un extremo de salida corriente abajo. Caperuzas finales de entrada y salida, moldeadas, 452 y 454 tienen una estructura tubular escalonada con porciones de diámetros más pequeños y más grandes para empalmar, respectivamente, con una manguera flexible más pequeña y más grande (por ejemplo, 1.25 pulgadas y 1.5 pulgadas de diámetro interior - ID) que forman la línea de retorno 422. Las conexiones del puerto primero y segundo, corriente arriba y corriente abajo 456 y 458 se proyectan desde la porción principal del cuerpo y conectan a las líneas 430 y 432, respectivamente. La conexión 456 se localiza próxima a un estrangulamiento 460 en el cuerpo. El estrangulamiento 460 (FIG. 26 con la caperuza final de entrada retirada) forma una rampa 462 que se proyecta hacia adentro para bloquear una porción sustancial de la sección transversal del cuerpo. Una extensión tubular 464 de la conexión 456 se prolonga en el cuerpo para encontrarse con la rampa 462 y tiene una abertura orientada corriente arriba 466. A medida que el agua pasa a través del desviador, se fuerza una porción a través de la abertura 466 para servir como flujo de entrada del dosificador. El flujo de salida del dosificador regresa a través del puerto 458. Una aplicación ejemplar del desviador 424 es una aplicación de flujo relativamente bajo con alrededor de 20-50 galones por minuto a través de la línea de retorno a la piscina. Con este flujo relativamente bajo, se desea un estrangulamiento relativamente alto para proporcionar una diferencia de presión apropiada a través del desviador y, con ello, un flujo apropiado a través del dosificador. Por ejemplo, la rampa 462 puede obstruir ligeramente más de la mitad de la sección transversal del desviador.

FIGS. 25 y 27 muestran un desviador alterno en el cual la rampa estrangula menos de la mitad de la sección transversal. Esto puede ser adecuado para proporcionar un flujo similar a través del dosificador con un flujo más elevado de línea de retorno (por ejemplo, 45-100 galones por minuto). Éste puede ser el caso para piscinas relativamente más grandes (típicamente empotradas en el suelo), que utilizan tubería rígida como línea de retorno, en lugar de una manguera flexible. En consecuencia, este desviador alterno carece de conexiones para manguera.

Para efectos de ilustración, se muestran un número de porciones estructurales principales del dosificador, seccionadas como si se moldearan en forma de productos de paredes gruesas. No obstante, los productos comerciales se moldean preferiblemente para producir paredes delgadas mediante técnicas tales como moldeo por inyección. Las vistas pueden reflejar asimismo otros artefactos del proceso CAD (de diseño asistido por computador) particular, usado para generar los dibujos, y de diferentes simplificaciones de ingeniería, ninguna de las cuales afectaría la divulgación a una persona de habilidades ordinarias en el arte.

Se han descrito una o más incorporaciones de la presente invención. No obstante, se entenderá que pueden hacerse varias modificaciones sin apartarse del espíritu y el ámbito de la invención. Por ejemplo, puede haber múltiples implementaciones físicas de los principios funcionales básicos que se han esbozado. Diferentes consideraciones de manufactura pueden influir en la forma adoptada por cualquier dosificador de producción. Es posible el empleo en aplicaciones distintas de las piscinas (por ejemplo, aplicaciones industriales), tal como el uso para dispensar una variedad de productos químicos (por ejemplo, bisulfato de sodio, útiles para control de los niveles de pH). En consecuencia, otras incorporaciones se encuentran dentro del ámbito de las siguientes reivindicaciones. Todas las solicitudes de patente, patentes y demás publicaciones citadas aquí se incorporan por referencia en su totalidad.

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Lo que se reivindica es:

1. Un dispositivo dosificador, para introducir un producto químico en un flujo de agua, que comprende:

una entrada del dosificador (36) y una salida del dosificador (38);

un depósito (74) del producto químico en forma sólida y que tiene una porción inferior provista de agujeros (70);

una primera tubería (80) que tiene una salida (78) y en comunicación con la entrada del dosificador (36) en por lo menos una primera condición del dosificador;

una pared (82) que rodea la salida de la tubería (78) y que se proyecta hacia arriba de la misma y, en por lo menos dicha primera condición del dosificador, manteniendo un cuerpo de agua en el cual se sumerge dicha salida de tubería;

una cámara de salida (84) que, en por lo menos dicha primera condición del dosificador, recibe el rebosamiento que contiene el producto químico disuelto del cuerpo y está en comunicación con la salida del dosificador.

2. El dispositivo de la reivindicación 1 en donde dicha salida de tubería comprende una boquilla de impulsor plano dirigida hacia arriba.

3. El dispositivo de la reivindicación 1 en donde la primera boquilla tiene dimensiones efectivas para transportar un caudal de agua de entre 0.2 gpm y 2 gpm (0.8 y 8 litros/minuto) a 5 psig.

4. El dispositivo de la reivindicación 1 en donde dicha pared tiene:

una pluralidad de primeras aberturas (208) a través de las cuales pasa dicho rebosamiento en dicha primera condición del dosificador.

5. El dispositivo de la reivindicación 4 en donde:

extremidades inferiores de las primeras aberturas (208) se sitúan

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encima de la salida de tubería (78) pero por debajo de una extremidad inferior de un interior del depósito (74).

6. El dispositivo de la reivindicación 1 en donde dicha pared (82) tiene:
una porción continua que se proyecta a una altura por encima de la salida de tubería (78) de manera que, al suspenderse el flujo a través de la salida de tubería, la salida de tubería permanece por debajo de una superficie del cuerpo en una segunda condición del dosificador.

7. El dispositivo de la reivindicación 6 en donde la porción continua termina a una altura por debajo de una altura mínima del producto químico en el depósito, de manera que, en la segunda condición del dosificador, la superficie del cuerpo está por debajo de dicha altura mínima.

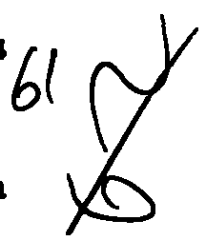
8. El dispositivo de la reivindicación 1 en donde:
el depósito (74) comprende una botella polimérica invertida que tiene una porción de rosca externa acoplada a un receptáculo de rosca interna del dosificador cuando se instala en el mismo;

una tapa de dosificador removible (300) tiene una condición instalada que cubre la botella invertida y sellada con relación a un cuerpo del dosificador, de manera que permita mantener un espacio de cabeza del dosificador a una presión de 10 psig.

9. El dispositivo de la reivindicación 1 que comprende además:
una válvula manual accionada por el usuario (95) que controla el flujo a través de la salida de tubería (78).

10. El dispositivo de la reivindicación 9 en donde:
la válvula manual accionada por el usuario (95) comprende un elemento de válvula (130) que puede girar alrededor de un eje de válvula en una pluralidad de orientaciones;

en un primer grupo de dichas orientaciones el elemento de válvula

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provee una pluralidad de diferentes grados de estrangulamiento del flujo a través de la salida de tubería;

en por lo menos una segunda de dichas orientaciones, el elemento de válvula evita el flujo a través de la salida de tubería y permite un flujo de desagüe desde la cámara de salida y rodeando la salida del dosificador.

11. El dispositivo de la reivindicación 10 que comprende además:

una cazoleta de desagüe (190) que puede retirarse en forma no destructiva, situada debajo del elemento de válvula de modo que reciba el flujo de desagüe.

12. El dispositivo de la reivindicación 10 en donde:

el elemento de válvula (130) comprende superficies superior e inferior;

un eje de impulsión (170) pende de la superficie inferior; y

una palanca (180) se proyecta radialmente del eje de impulsión (170) y puede asirse por el usuario para girar el elemento de válvula (130) entre el gran número de orientaciones.

13. El dispositivo de la reivindicación 10 en donde:

el elemento de válvula (130) comprende superficies superior e inferior (132 y 134);

el elemento de válvula se mantiene en compresión entre una brida en un extremo próximo de la tubería y una porción del cuerpo del dosificador; y

el elemento de válvula tiene un primer puerto superior alineado con una entrada de la tubería, y un primer puerto inferior en comunicación con el primer puerto superior y desplazado radialmente del eje de la válvula.

14. El dispositivo de la reivindicación 10 en donde el elemento de válvula comprende:

superficies superior e inferior;

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un puerto de entrada (150) en la superficie inferior, desplazado radialmente del eje de la válvula y que recibe agua de la entrada del dosificador en la primera condición del dosificador;

un puerto de salida central (142) en la superficie superior y que lleva agua a la primera tubería en la primera condición del dosificador;

y

un pasadizo que penetra las superficies superior e inferior y que pasa el rebosamiento en la primera condición del dosificador.

15. El dispositivo de la reivindicación 14 en donde el puerto de entrada en la superficie inferior comprende un arreglo de aberturas (208) en una brida inferior (204) de la válvula (95), dispuestas las aberturas en una pluralidad de diferentes ubicaciones angulares alrededor de un eje central del elemento de válvula (130).

16. El dispositivo de la reivindicación 1 en donde:

en dicha primera condición del dosificador, un flujo a través de la salida de tubería (78) representa una desviación de entre 0.5% y 10% de un flujo entre la entrada del dosificador (36) y la salida (38);

en una segunda condición del dosificador, no hay sustancialmente flujo a través de la salida de tubería (78), y el flujo entre la entrada y salida del dosificador es sustancialmente el mismo que en la primera condición del dosificador.

17. El dispositivo de la reivindicación 1 en donde el producto químico consiste esencialmente de hipoclorito de calcio, ácido dicloroisocianúrico, ácido tricloroisocianúrico o combinaciones de los mismos.

18. El dispositivo de la reivindicación 17 en donde el flujo de agua es un flujo recirculante hacia/desde una piscina, y el producto químico consiste esencialmente de hipoclorito de calcio en forma de briquetas.

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19. El dispositivo de la reivindicación 1 en donde el depósito comprende:

Un recipiente (24) que se puede retirar en forma no destructiva, acoplado a una porción del receptáculo del dosificador y que tiene un interior y una boca, estando la boca tapada por dicha porción inferior provista de agujeros (70).

20. Un dispositivo dosificador para introducir un producto químico en un flujo de agua, que comprende:

una entrada del dosificador (36) y una salida del dosificador (38);

un depósito (74) del producto químico en forma sólida y que tiene una porción inferior provista de agujeros (70);

una primera tubería (80) que tiene una salida (78) y en comunicación con la entrada del dosificador (36) en por lo menos una primera condición del dosificador;

medios para mantener un cuerpo de agua en el cual se sumerge dicha salida de tubería (78) en por lo menos dicha primera condición del dosificador;

medios para modificar el flujo a través de la tubería para elevar localmente una superficie de dicho cuerpo entre:

un primer nivel (502) en dicha primera condición del dosificador, en la cual el cuerpo contacta el producto químico en el depósito, de manera que disuelva tal producto químico;

un segundo nivel en una segunda condición del dosificador en la cual el cuerpo no contacta el producto químico en el depósito; y

medios para, en por lo menos dicha primera condición del dosificador, dirigir el flujo (526), que contiene el producto químico disuelto del cuerpo, a la salida del dosificador (38).

21. El dispositivo de la reivindicación 20 en donde dicha salida de tubería (78) comprende una boquilla impulsora plana orientada hacia arriba, y la elevación se limita a una porción central de una superficie superior del cuerpo por encima de la boquilla de impulsor plano.

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22. El dispositivo de la reivindicación 20 en donde dichos medios para mantenimiento comprenden una pared que tiene:

una pluralidad de primeras aberturas (208) a través de las cuales pasa dicho rebosamiento en dicha primera condición del dosificador.

23. El dispositivo de la reivindicación 20 en donde:

el depósito comprende una botella polimérica invertida (74) que tiene una porción de rosca externa acoplada a un receptáculo de rosca interna del dosificador, cuando se instala al mismo;

una tapa de dosificador removible (300) tiene una condición instalada que cubre la botella invertida y sellada con relación a un cuerpo del dosificador, de modo que permita mantener un espacio de cabeza del dosificador a una presión de 8 psig.

24. Un sistema de tratamiento de agua de piscina que comprende:

el dispositivo de la reivindicación 1;

por lo menos una bomba (30);

un filtro (32); y

una red de tubería (26, 28) que acopla el dispositivo, la bomba y el filtro a una piscina para filtrar y clorar un flujo recirculante de agua hacia/desde la piscina.

25. Un dispositivo para introducir cloro de un producto químico de tratamiento, que contiene cloro, en un flujo de agua hacia/desde una piscina, que comprende:

una entrada del dosificador (36) que recibe agua del flujo;

un depósito (74) del producto químico en forma sólida y que tiene una porción inferior provista de agujeros (70);

una primera tubería (80) que tiene una salida (78) y en comunicación con la entrada del dosificador (36) en por lo menos una primera condición del dosificador;

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una pared (82), que circunda la salida de tubería y que se proyecta hacia arriba de la misma y, en por lo menos dicha primera condición del dosificador, mantiene un cuerpo de agua en el cual se sumerge dicha salida de tubería, descargando agua la primera tubería, en dicha primera condición del dosificador, a través de la salida de tubería a una rata y velocidad efectivas para elevar localmente una primera porción de superficie del cuerpo en una altura de entre 0.125 pulgadas y 1.0 pulgadas por encima de otra porción de superficie del cuerpo, de modo que la primera porción de superficie contacte el producto químico para disolver el producto químico;

una cámara de salida que, en por lo menos dicha primera condición del dosificador, recibe dicho producto químico disuelto; y

una salida del dosificador que devuelve al flujo dicho producto químico disuelto.

26. El dispositivo de la reivindicación 25 en donde dicha altura está entre 0.25 pulgadas y 0.5 pulgadas.

27. El dispositivo de la reivindicación 25 en donde dicha porción inferior provista de agujeros está por lo menos 0.0625 pulgadas encima de dicha otra porción de superficie.

28. Un método para introducir un producto químico de tratamiento en un cuerpo de agua a que comprende los pasos de:

proveer un dosificador que tiene una entrada (36), una salida (38), y que contiene un producto químico sólido en un depósito para el producto químico (74);

hacer que un flujo de agua del cuerpo ingrese al dosificador a través de la entrada y salga a través de la salida para regresar al cuerpo, de modo que accione el dosificador en por lo menos una primera condición de estado permanente en donde:

por lo menos una primera porción del flujo se dirige a través de una salida de tubería (78) a un primer cuerpo de agua, de modo que

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se produce por lo menos una elevación local de una porción de una superficie de ese primer cuerpo, contactando la elevación local una porción inferior provista de agujeros de un depósito de dicho producto químico de tratamiento en forma sólida, de modo que se disuelva dicho producto químico de tratamiento; y

dicho producto químico de tratamiento, disuelto, se dirige a dicha salida; y

estrangular por lo menos dicha primera porción de flujo, de modo que se desconecte el primer cuerpo de agua del depósito y haga que el dosificador entre por lo menos en una segunda condición de estado permanente.

29. El método de la reivindicación 28 en donde en la segunda condición la salida de tubería permanece sumergida en el cuerpo.

30. El método de la reivindicación 29 en donde la primera porción del flujo representa entre 0.1% y 10% de un flujo total a través del dosificador.

31. El método de la reivindicación 28 en donde el estrangulamiento comprende girar un elemento de válvula (130) de una primera orientación en dicha primera condición a una segunda orientación.

32. El método de la reivindicación 28 que comprende además:
retirar una tapa del dosificador (300);
retirar el depósito (74) en una condición desocupada;
reemplazar el depósito con un depósito de repuesto lleno;
reponer la tapa del dosificador, y
restablecer el flujo para regresar el dosificador a la primera condición.

33. Un recipiente químico (74) en una condición instalada en un receptáculo de un dosificador de producto químico y, que comprende:



dicho producto químico, que incluye en la mayor proporción hipoclorito de calcio;

un cuerpo plástico moldeado que contiene el producto químico y que tiene:

un extremo inferior abierto;

un extremo superior cerrado; y

una porción de rosca externa, próxima al extremo inferior en acople roscado a una porción complementaria, de rosca interna, del receptáculo; y

una tapa provista de agujeros (70) que se proyecta a través de la boca del recipiente y que sostiene por lo menos el producto químico y que tiene una porción central sumergida en una porción central elevada localmente de un cuerpo de agua.

34. El recipiente químico de la reivindicación 33 en donde:
el cuerpo y la tapa provista de agujeros consiste esencialmente de polietileno.

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
WILLIAM A. SIMONS
WIGGIN & DANA LLP
ONE CENTURY TOWER
NEW HAVEN, CT 06508-1832

PCT

WRITTEN OPINION

(PCT Rule 66)

Applicant's or agent's file reference 102281-201		Date of Mailing (day/month/year) 18 SEP 2003 REPLY DUE within 2 months/days from the above date of mailing
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.2002)	Priority date (day/month/year) 04 December 2001 (04.12.2001)
International Patent Classification (IPC) or both national classification and IPC IPC(7): B01D 11/02 and US Cl.: 137/268; 422/278, 264		
Applicant ARCH CHEMICALS, INC.		

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 04 April 2004 (04.04.2004).

Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer <i>A. Huxley</i> KEVIN L LEE Telephone No. (703) 308-0861
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Form PCT/IPEA/408 (cover sheet)(July 1998)

SEP 25 2003

WRITTEN OPINION

International application No.

PCT/US02/38824

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I. Basis of the opinion

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages 1-15, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.
- ☒ the claims:
 pages 16-22, as originally filed
 pages NONE, as amended (together with any statement) under Article 19
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.
- ☒ the drawings:
 pages 1-20, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
 pages NONE, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

WRITTEN OPINION

International application No.
PCT/US02/38824

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V. Reasoned statement under Rule 66.2(a)(II) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>3, 5-8 and 10-34</u>	YES
	Claims <u>1, 2, 4 and 9</u>	NO
Inventive Step (IS)	Claims <u>5-8, 10-16 and 19-34</u>	YES
	Claims <u>1-4, 9, 17 and 18</u>	NO
Industrial Applicability (IA)	Claims <u>1-34</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

V. 2. Citations and Explanations:

Claims 1, 2, 4 and 9 lack novelty under PCT Article 33(2) as being anticipated by Palmer. Palmer teaches a feeder device comprising a feeder inlet (15), a feeder outlet (17), a first conduit (26) having an outlet (28), a wall (29) surrounding the conduit outlet (28) and an outlet chamber (42) receiving overflow containing the dissolved chemical from the body and in communication with the feeder outlet.

Claims 3, 17 and 18 lack an inventive step under PCT Article 33(3) as being obvious over Palmer. It would not have involved an inventive step to determine the optimum water flow rate of the nozzle to be between 0.2 gpm and 2 gpm or to use calcium hypochlorite as the chemical agent in the feeder device to prevent the growth of algae in a swimming pool.

Claims 3, 5-8 and 10-34 have novelty under PCT Article 33(2), because the prior art, taken singly, does not teach or fairly suggest the invention as claimed.

Claim 5 meets the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminat lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, the feeder device further comprising a plurality of first apertures through which the overflow passes in a first feeder condition, lower extremities of the first apertures being above the conduit outlet yet below a lower extremity of an interior of the reservoir.

Claims 6 and 7 meet the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminat lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed in a first feeder condition, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, the wall having a continuous portion extending to a height above the conduit outlet so that upon termination of the flow through the conduit outlet, the conduit outlet remains below a surface of the body in a second feeder condition.

Claims 8 and 19 meet the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminat lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed in a first feeder condition, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, the reservoir comprising an inverted polymeric bottle having an externally threaded portion engaged to an internally threaded receptacle of the feeder.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Claims 10-15 meet the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminant lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed in a first feeder condition, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, a user-activated manual valve controlling flow through the conduit outlet, the valve comprising a valve element rotatable about a valve axis through a plurality of orientations, wherein in one of the orientations, the valve element prevents the flow through the conduit outlet and permits a drain flow from the outlet chamber and bypasses the feeder outlet.

Claim 16 meets the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminant lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed in a first feeder condition, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, wherein in the first feeder condition, a flow through the conduit outlet represents a diversion of between 0.5 and 10% of a flow between the feeder inlet and outlet and in a second feeder condition, there is substantially no flow through the conduit outlet and the flow between the feeder inlet and outlet is substantially the same as in the first feeder condition.

Claims 20-23 and 25-32 meet the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device or a method for introducing a treatment chemical into a body of water in the feeder device comprising a feeder inlet and outlet, a reservoir having a foraminant lower portion, a first conduit having an outlet, means for maintaining a body of water in which the conduit outlet is immersed in at least a first condition, means for altering flow through the conduit to locally elevate a surface of the body between a first level in which the body contacts the chemical in the reservoir, a second level in a second feeder condition in which the body does not contact the chemical in the reservoir and means for directing flow containing the dissolved chemical from the body to the feeder outlet.

Claim 24 meets the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a feeder device comprising a feeder inlet and outlet, a reservoir having a foraminant lower portion, a first conduit having an outlet, a wall surrounding the conduit outlet and extending upward and maintaining a body of water in which the conduit outlet is immersed, an outlet chamber receiving overflow containing the dissolved chemical and in communication with the feeder outlet, the feeder device further comprising at least one pump, a filter and a conduit network coupling the device, pump and filter to a swimming pool.

Claims 33 and 34 meet the criteria set out in PCT Article 33(3) because the prior art does not teach or fairly suggest a chemical container comprising a molded plastic body for containing a chemical agent, the body having an open lower end, a closed upper end and an externally-threaded portion in the lower end for engagement to a internally-threaded portion of a receptacle of a chemical feeder and a foraminant cover extending across the container mouth and at least partially supporting the chemical and having a central portion immersed in a locally elevated central portion of a body of water.

Claims 1-34 have industrial applicability under PCT Article 33(4) because the subject matter claimed can be used in industry.

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

To: WILLIAM A. SIMONS WIGGIN & DANA LLP ONE CENTURY TOWER NEW HAVEN, CONNECTICUT 06508-1832		Date of mailing <i>(day/month/year)</i> 16 JUL 2003
Applicant's or agent's file reference 102281-201		IMPORTANT NOTIFICATION
International application No. PCT/US02/38824	International filing date <i>(day/month/year)</i> 03 Dec 2002	Priority date <i>(day/month/year)</i> 04 Dec 2001
Applicant ARCH CHEMICALS, INC.		

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

10 JUN 2003 (10.06.03)

2. That date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 19(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

☐ *(If applicable)* This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/ Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450	Authorized officer Paul Baltimore
Facsimile No. 703-305-3230	Telephone No. (703) 305-6779

Form PCT/IPEA/402 (July 1998)



PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU.

PCT

INFORMATION CONCERNING ELECTED
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

To:

SIMONS, William, A.
Wiggin & Dana LLP
One Century Tower
New Haven, CT 06508-1832
United States of America

Date of mailing (day/month/year) 04 August 2003 (04.08.03)		
Applicant's or agent's file reference 102281-201		IMPORTANT INFORMATION
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.02)	Priority date (day/month/year) 04 December 2001 (04.12.01)
Applicant ARCH CHEMICALS, INC.		

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK,
TR

National: AU, BG, CA, CN, DE, GB, IL, JP, KP, KR, MN, NO, PL, RO, RU, SK

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA: AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

OA: BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG

National: AE, AG, AL, AM, AT, AZ, BA, BB, BR, BY, BZ, CH, CO, CR, CU, CZ, DK, DM, DZ, EC, EE,

ES, FI, GD, GE, GH, GM, HR, HU, ID, IN, IS, KE, KG, KZ, LG, LK, LR, LS, LT, LU, LV, MA, MD, MG,

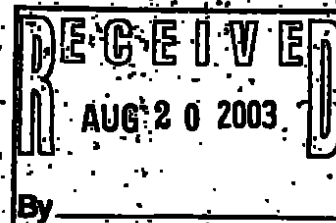
MK, MW, MX, MZ, NZ, OM, PH, PT, SD, SE, SG, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA,

ZM, ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 38(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 38(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.



The International Bureau of WIPO 34, chemin des Colombettes 1211 Genève 20, Switzerland Facsimile No. (41-22) 740-1435	Authorized officer: Zakaria EL KHODARY Telephone No. (41-22) 338 8240
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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

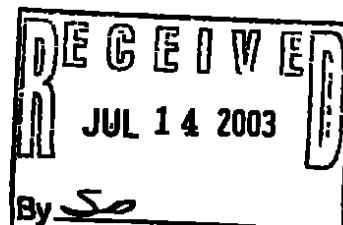
To:

SIMONS, William, A.
Wiggin & Dana LLP
One Century Tower
New Haven, CT 06508-1832
United States of America

Date of mailing (day/month/year) 23 June 2003 (23.06.03)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 102281-201	
International application No. PCT/US02/38824	
International publication date (day/month/year) 12 June 2003 (12.06.03)	
International filing date (day/month/year) 03 December 2002 (03.12.02)	Priority date (day/month/year) 04 December 2001 (04.12.01)
Applicant ARCH CHEMICALS, INC.	

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
04 Dec 2001 (04.12.01)	60/338,386	US	10 Janu 2003 (10.01.03)
27 June 2002 (27.06.02)	60/392,727	US	10 Janu 2003 (10.01.03)



The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740-1435	Authorized officer Zakaria EL KHODARY Telephone No. (41-22) 338 8240
---	---

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The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:
IPEA/ US

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
 The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only			
Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 102281-201	
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.02)	(Earliest) Priority date (day/month/year) 04 December 2001 (04.12.01)	
Title of invention CHEMICAL FEEDER			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ARCH CHEMICALS, INC. a Corporation of the Commonwealth of Virginia, U.S.A. 501 Merritt 7 P.O. Box 5204 New Haven, Connecticut 06856-5204 United States of America		Telephone No. 203-229-2900	
		Facsimile No. 203-229-2613	
		Teleprinter No.	
		Applicant's registration No. with the Office	
State (that is, country) of nationality: US		State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
☐ Further applicants are indicated on a continuation sheet.			

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given names; for a legal entity, full official designation.
The address must include postal code and name of country.)*SIMONS, William A.
WIGGIN & DANA LLP
One Century Tower
New Haven, Connecticut 06508-1832
United States of America

Telephone No.

203-498-4502

Facsimile No.

203-782-2889

Teleprinter No.

Agent's registration No. with the Office

27,096

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☒ as originally filed☐ as amended under Article 34the claims ☒ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☒ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary
Examining Authority use only

- | | |
|--------------------------|--------------------------|
| received | not received |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listings in computer readable form |
| 3. ☐ original general power of attorney | 7. ☐ tables in computer readable form related to sequence listings |
| 4. ☐ copy of general power of attorney; reference number, if any: | 8. ☒ other (specify): postcard receipt |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


William A. Simons, Reg. No. 27,096
Agent

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PATENT COOPERATION TREATY

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From the INTERNATIONAL SEARCHING AUTHORITY

To: WILLIAM A. SIMONS WIGGIN & DANA LLP ONE CENTURY TOWER NEW HAVEN, CT 06508-1832

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 102281-201	Date of Mailing (day/month/year) 23 APR 2003
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.2002)
Applicant ARCH CHEMICALS, INC.	

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34, chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90 bis.1 and 90 bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US Commissioner for Patents Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230 Form PCT/ISA/220 (April 2002)	Authorized officer KEVIN L LEE  Telephone No. (703) 308-0861 (See notes on accompanying sheet)
---	--

RECEIVED

APR 29 2003

By SB

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

80 18

Applicant's or agent's file reference 102281-201	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.2002)	(Earliest) Priority Date (day/month/year) 04 December 2001 (04.12.2001)
Applicant ARCH CHEMICALS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐

contained in the international application in written form.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority in written form.

☐

furnished subsequently to this Authority in computer readable form.

☐

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

☒

the text is approved as submitted by the applicant.

☐

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐

the text is approved as submitted by the applicant.

☒

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 5

☒

as suggested by the applicant.

☐

because the applicant failed to suggest a figure.

☐

because this figure better characterizes the invention.

☐

None of the figures

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/38824

81

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B01D 11/02
US CL : 137/268; 422/278, 264

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 137/268; 422/278, 264, 277Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,765,945 A (PALMER) 16 June 1998 (16.06.1998), column 5, lines 14-60.	1, 2, 4, and 9
Y		3 and 17
A	US 5,536,479 A (MILLER et al) 16 July 1996 (16.07.1996), column 2, lines 54-64.	1

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"A"

document member of the same patent family

Date of the actual completion of the international search

04 April 2003 (04.04.2003)

Date of mailing of the international search report

23 APR 2003

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

KEVIN L LEE

Telephone No. (703) 308-0861

INTERNATIONAL SEARCH REPORT

82 
International application No.

PCT/US02/38824

Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

A feeder device for introducing a chemical into a flow of water includes a feeder inlet (36) and a feeder outlet (38), a reservoir (74) of the chemical in solid form and having a foraminous lower portion (70), a first conduit (80) having an outlet (78) and in communication with the feeder inlet (36) in at least a first feeder condition, a wall (82) surrounding the conduit outlet (78) and extending upward thereof, and an outlet chamber (84) receiving overflow containing the dissolved chemical and in communication with the feeder outlet.

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NOTES TO FORM PCT/ISA/220 (continued)

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 31]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

The statement should be brief, it should not exceed 300 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)".

It should not contain any disparaging comments on the international search report or the substance of objections contained in the report. References to claims, relating to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

In what language?

The amendments must be made in the language in which the international application is published. The letter and any statement accompanying the amendments must be in the same language as the international application if that language is English or French; otherwise, it must be in English or French, at the choice of the applicant.

Consequences if a demand for international preliminary examination has already been filed?

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequences with regard to translation of the international application for entry into the national phase?

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Office, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty and of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and these requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination period, there is usually no need to file amendments of the claims under Article 19 except when, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

The claims only.

The description and the drawings may only be amended during international preliminary examination under Chapter II.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever date first expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the stipulated time limit but before the completion of the technical preparations for international publication (Rule 46.2).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been filed, see below.

How? Either by cancelling one or more earlier claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or cancellation, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no numbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 203(b)).

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confounded with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

PATENT COOPERATION TREATY

PCT

NOTIFICATION RELATING TO PRIORITY CLAIM

(PCT Rules 26bis.1 and 26bis.2 and
Administrative Instructions, Sections 402 and 409)

From the INTERNATIONAL BUREAU

To:

SIMONS, William, A.
Wiggin & Dana LLP
One Century Tower
New Haven, CT 06508-1832
United States of AmericaDate of mailing (day/month/year)
18 March 2003 (18.03.03)Applicant's or agent's file reference
102281-201

IMPORTANT NOTIFICATION

International application No.
PCT/US02/38824International filing date (day/month/year)
03 December 2002 (03.12.02)

Applicant

ARCH CHEMICALS, INC.

The applicant is hereby notified of the following in respect of the priority claim(s) made in the international application.

- 1.
- ☒
- Correction of priority claim. In accordance with the applicant's notice received on: 11 March 2003 (11.03.03), the following priority claim has been corrected to read as follows:

US 02 December 2002 (02.12.02) 10/307,671

- ☐ even though the indication of the number of the earlier application is missing.
- ☐ even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:

- 2.
- ☐
- Addition of priority claim. In accordance with the applicant's notice received on: , the following priority claim has been added:

- ☐ even though the indication of the number of the earlier application is missing.
- ☐ even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:

- 3.
- ☒
- As a result of the correction and/or addition of (a) priority claim(s) under items 1 and/or 2, the (earliest) priority date is:
-
- 04 December 2001 (04.12.01)

- 4.
- ☐
- Priority claim considered not to have been made:

- ☐ The applicant failed to respond to the invitation under Rule 26bis.2(a) (Form PCT/IB/318) within the prescribed time limit.
- ☐ The applicant's notice was received after the expiration of the prescribed time limit under Rule 26bis.1(a).
- ☐ The applicant's notice failed to correct the priority claim so as to comply with the requirements of Rule 4.10.

The applicant may, before the technical preparations for international publication have been completed and subject to the payment of a fee, request the International Bureau to publish, together with the international application, information concerning the priority claim. See Rule 26bis.2(c) and the PCT Applicant's Guide, Volume I, Annex B2(18).

- 5.
- ☐
- In case where multiple priorities have been claimed, the above item(s) relate to the following priority claim(s):

6. A copy of this notification has been sent to the receiving Office and

- ☒ to the International Searching Authority (where the international search report has not yet been issued).
- ☒ the designated Offices (which have already been notified of the receipt of the record copy).

RECEIVED
APR 09 2003The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740-1435

Authorized officer

Laurence GALLAY

Telephone No. (41-22) 338 8310

PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

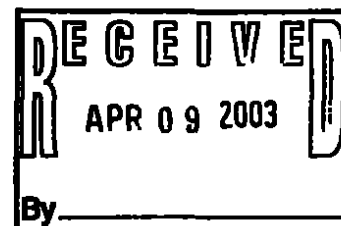
To:

SIMONS, William, A.
Wiggin & Dana LLP
One Century Tower
New Haven, CT 06508-1832
United States of America

Date of mailing (day/month/year) 18 March 2003 (18.03.03)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 102281-201	
International application No. PCT/US02/38824	
International publication date (day/month/year) Not yet published	
International filing date (day/month/year) 03 December 2002 (03.12.02)	Priority date (day/month/year) 04 December 2001 (04.12.01)
Applicant ARCH CHEMICALS, INC.	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
04 Dec 2001 (04.12.01)	60/338,386	US	10 Janu 2003 (10.01.03)
27 June 2002 (27.06.02)	60/392,727	US	10 Janu 2003 (10.01.03)



The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740-1435	Authorized officer Laurence GALLAY Telephone No. (41-22) 338 8310
---	---

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

PCT

INVITATION TO CORRECT PRIORITY CLAIM

(PCT Rules 4.10, 26bis.1, 26bis.2(a) and (b))

To:

SIMONS, William, A.
 Wiggin & Dana LLP
 One Century Tower
 New Haven, CT 06508-1832
 ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 20 February 2003 (20.02.03)	
Applicant's or agent's file reference 102281-201	REPLY DUE See item 1
International application No. PCT/US02/38824	International filing date (day/month/year) 03 December 2002 (03.12.02)
Applicant ARCH CHEMICALS, INC.	

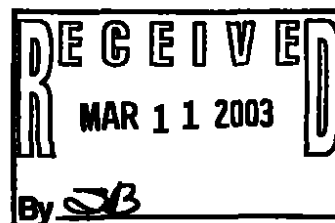
The applicant is hereby invited, within the time limit indicated below, to correct, by a notice submitted to the International Bureau, defects in the priority claim(s), as indicated in the Annex:

- Time limit to respond to this invitation (Rule 26bis.1(a)):
 - within 16 months from the (earliest) priority date; or
 - if the (earliest) priority date is changed as a result of the correction or addition of the (earliest) priority claim, within 16 months from that (earliest) priority date so changed,
 whichever expires first, provided that such a notice may, in any event, be submitted until the expiration of four months from the international filing date.

Failure to respond to this invitation within the prescribed time limit may result in the priority claim concerned to be considered, for the purposes of the procedure under the PCT, not to have been made (Rule 26bis.2(b)).

- In the case where multiple priorities have been claimed, this invitation relates to the following priority claim(s):
 US 02 December 2002 (02.12.02)

- A copy of this invitation is being sent to the receiving Office.



The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Anman QIU
---	-------------------------------------

The International Bureau has found the following defects in the priority claim(s):

1. Failure to Comply with the Requirements of Rule 4.10

a. ☒ National application

- ☐ Missing indication of the filing date of the earlier application.
- ☐ Filing date indicated for the earlier application does not fall within the period of 12 months preceding the international filing date.
- ☒ Missing indication of the number of the earlier application.*
- ☐ Missing indication of the country party to the Paris Convention for the Protection of Industrial Property, or of the Member of the World Trade Organization that is not party to that Convention, in which the earlier national application was filed.
- ☐ The country indicated is neither a party to the Paris Convention for the Protection of Industrial Property nor a Member of the World Trade Organization.

b. ☐ Regional application

- ☐ Missing indication of the filing date of the earlier application.
- ☐ Filing date indicated for the earlier application does not fall within the period of 12 months preceding the international filing date.
- ☐ Missing indication of the number of the earlier application.*
- ☐ Missing indication of the authority entrusted with the granting of regional patents under the applicable regional patent treaty.
- ☐ The authority indicated as the authority entrusted with the granting of regional patents does not grant regional patents.
- ☐ The priority claim in relation to the ARIPO application does not indicate either at least one country party to the Paris Convention for the Protection of Industrial Property, or at least one Member of the World Trade Organization, for which the earlier application was filed.

c. ☐ International application

- ☐ Missing indication of the filing date of the earlier application.
- ☐ Filing date indicated for the earlier application does not fall within the period of 12 months preceding the international filing date.
- ☐ Missing indication of the number of the earlier application.*
- ☐ Missing indication of the receiving Office with which it was filed.

2. Inconsistency with the Corresponding Indications in the Priority Document*

a. ☐ Inconsistency with regard to the filing date of the earlier application:

The request indicates:

The priority document indicates:

b. ☐ Inconsistency with regard to the number of the earlier application:

The request indicates:

The priority document indicates:

c. ☐ Inconsistency with regard to the country party to the Paris Convention for the Protection of Industrial Property or the Member of the World Trade Organization in which the national application was filed:

The request indicates:

The priority document indicates:

d. ☐ Inconsistency with regard to the authority entrusted with the granting of regional patents under the applicable regional patent treaty:

The request indicates:

The priority document indicates:

e. ☐ Inconsistency with regard to the receiving Office with which the international application was filed:

The request indicates:

The priority document indicates:

* Even if this defect is not corrected in response to this invitation, the priority claim concerned will not be considered not to have

PATENT COOPERATION TREATY

PCT

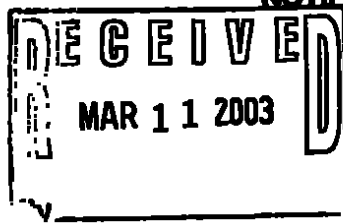
From the INTERNATIONAL BUREAU

To:

SIMONS, William, A.
Wiggin & Dana LLP
One Century Tower
New Haven, CT 06508-1832
United States of America

NOTIFICATION OF RECEIPT OF
RECORD COPY

PCT Rule 24.2(a))



Date of mailing (day/month/year) 20 February 2003 (20.02.03)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 102281-201	International application No. PCT/US02/38824

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

ARCH CHEMICALS, INC.(all designated States)

International filing date : 03 December 2002 (03.12.02)

Priority date(s) claimed : 04 December 2001 (04.12.01)

27 June 2002 (27.06.02)

02 December 2002 (02.12.02)

Date of receipt of the record copy
by the International Bureau

: 31 December 2002 (31.12.02)

List of designated Offices

:

EA :AM,AZ,BY,KG,KZ,MD,RU,TJ,TM

EP :AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE,SI,SK,TR

OA :BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG

National :AE,AG,AL,AM,AT,AU,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CO,CR,CU,CZ,DE,DK,DM,DZ,

EC,EE,ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KP,KR,KZ,LC,LK,LR,LS,LT,LU,

LV,MA,MD,MG,MK,MN,MW,MX,MZ,NO,NZ,OM,PH,PL,PT,RO,RU,SD,SE,SG,SK,SL,TJ,TM,TN,TR,TT,

TZ,UA,UG,UZ,VN,YU,ZA,ZM,ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

☒ time limits for entry into the national phase - see updated important information (as of April 2002)

☒ confirmation of precautionary designations (if applicable)

☒ requirements regarding priority documents (if applicable)

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

Anman QIU

Telephone No. (41-22) 338 9098

INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated on the cover sheet of this Notification by paying national fees and furnishing translations, as prescribed by Articles 22 and 39 and the applicable national laws. In addition, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure the necessary steps to enter the national phase are taken in a timely fashion. Most Offices do not issue reminders to applicants in connection with the entry into the national phase.

The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office where a demand for international preliminary examination is filed before the expiration of 19 months from the priority date (see Article 39(1)), but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see PCT Gazette No. 44/2001 of 1 November 2001, pages 19928, 19932 and 19934, as well as the PCT Newsletter, October and November 2001 and February 2002 issue.

In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the PCT Gazette ("Section IV" part published on a weekly basis), to the PCT Newsletter (on a monthly basis) and to the relevant National Chapters in Volume II of the PCT Applicant's Guide (the paper version of which is updated usually twice a year and the Internet version of which is updated usually on a weekly basis). Finally, a cumulative table of all applicable time limits for entering the national phase is available from WIPO's Internet site, via links from various pages the site including those of the Gazette, Newsletter and Guide, at <http://www.wipo.int/pct/en/index.html>.

Information about the requirements for filing a demand for international preliminary examination is set out in the PCT Applicant's Guide, Volume I/A, Chapter IX. Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(d) before the expiration of 16 months from the priority date (this time limit may not be extended). If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. The Notice of confirmation and payment must reach the receiving Office within the 16-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within the time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

PATENT COOPERATION TREATY

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From the RECEIVING OFFICE

PCT

**NOTIFICATION OF THE INTERNATIONAL
APPLICATION NUMBER AND OF THE
INTERNATIONAL FILING DATE**

(PCT Rule 20.5(c))

To: WILLIAM A. SIMONS WIGGIN & DANA LLP ONE CENTURY TOWER NEW HAVEN, CONNECTICUT 06508-1832		Date of mailing (day/month/year) 03 Jan 2003
Applicant's or agent's file reference 102281-201		IMPORTANT NOTIFICATION
International application No. PCT/US02/38824	International filing date (day/month/year) 03 Dec 2002	Priority date (day/month/year) 04 Dec 2001
Applicant ARCH CHEMICALS, INC.		
Title of the invention CHEMICAL FEEDER		

1. The applicant is hereby notified that the international application has been accorded the international application number and the international filing date indicated above.

2. The applicant is further notified that the record copy of the international application:

- ☒ was transmitted to the International Bureau on 03 Jan 2003
- ☐ has not yet been transmitted to the International Bureau for the reason indicated below and a copy of this notification has been sent to the International Bureau*:
- ☐ because the necessary national security clearance has not yet been obtained.
- ☐ because (reason to be specified):

* The International Bureau monitors the transmittal of the record copy by the receiving Office and will notify the applicant (with Form PCT/IB/301) of its receipt. Should the record copy not have been received by the expiration of 14 months from the priority date, the International Bureau will notify the applicant (Rule 22.1(c)).

3. FOREIGN TRANSMITTAL LICENSE INFORMATION

Completed by: JW

- ☐ Additional license for foreign transmittal not required. This subject matter is covered by a license already granted or the equivalent U.S. national application. Refer to that license for information concerning its scope.
- ☐ License for foreign transmittal not required. 37 CFR 5.11(e)(1) or 37 CFR 5.11(e)(2). However, a license may be required for additional subject matter. See 37 CFR 5.15(b).
- ☒ Foreign transmittal license granted. 35 U.S.C. 184; 37 CFR 5.11 on 28 Dec 2002
(date)
- ☒ 37 CFR 5.15(a) ☐ 37 CFR 5.15(b)

Name and mailing address of the receiving Office Assistant Commissioner for Patent, Box PCT Washington, D.C. 20231 Attn: RO/US	Authorized officer Jeanette Washington
Facsimile No. 703-305-3230	Telephone No. 703-305-3687

PATENT COOPERATION TREATY

From the RECEIVING OFFICE

PCT

NOTIFICATION REGARDING CERTAIN
CORRECTIONS MADE *EX OFFICIO*

(PCT Administrative Instructions, Section 327)

To: WILLIAM A. SIMONS WIGGIN & DANA LLP ONE CENTURY TOWER NEW HAVEN, CONNECTICUT 06508-1832		Date of mailing <i>(day/month/year)</i> 03 Jan 2003
Applicant's or agent's file reference 102281-201	REPLY DUE NONE However, see paragraph 3 below	
International application No. PCT/US02/38824	International filing date <i>(day/month/year)</i> 03 Dec 2002	
Applicant ARCH CHEMICALS, INC.		

1. The applicant is hereby notified that this receiving Office has corrected formal defects in the International application *ex officio*, as shown on the attached copy of:

- ☒ the request, sheet No.: 4
- ☐ the description, sheet No.: _____
- ☐ the claims, sheet No.: _____
- ☐ the drawings, sheet No.: _____
- ☐ other (specify): _____

2. If the applicant agrees with these corrections, no further action is required in this regard.

3. In case of disagreement with these corrections, the applicant should promptly inform this receiving Office accordingly.

Name and mailing address of the receiving Office Assistant Commissioner for Patent, Box PCT Washington, D.C. 20231 Attn:RO/US Facsimile No. 703-305-3230	Authorized officer Jeanette Washington Telephone No. 703-305-3687
---	--

Form PCT/RO/146 (July 1992)

Box No. VI PRIORITY CLAIM

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 04 December 2001 A (04.12.01)	60/338,386	US		
item (2) 27 June 2002 A (27.06.02)	60/392,727	US		
item (3) 02 December 2002 A (02.12.02)	Unknown	US		
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this International application is the receiving Office) identified above as:

☐ all items ☒ item (1) ☒ item (2) ☒ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / RO/US

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
02 December 2002 (02.12.02)	Unknown	US

Box No. VIII DECLARATIONS

The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

Number of declarations

- | | | |
|---|--|---|
| ☐ Box No. VIII (i) | Declaration as to the identity of the inventor | : |
| ☐ Box No. VIII (ii) | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent | : |
| ☐ Box No. VIII (iii) | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | : |
| ☐ Box No. VIII (iv) | Declaration of inventorship (only for the purposes of the designation of the United States of America) | : |
| ☐ Box No. VIII (v) | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty | : |

PATENT COOPERATION TREATY

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From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF RECEIPT
OF SEARCH COPY

(PCT Rule 25.1)

To:

**WILLIAM A. SIMONS
WIGGIN & DANA LLP
ONE CENTURY TOWER
NEW HAVEN, CONNECTICUT 06508-1832**

Date of mailing
(day/month/year)

03 Jan 2003

Applicant's or agent's file reference

102281-201

IMPORTANT NOTIFICATION

International application No.

PCT/US02/38824

International filing date (day/month/year)

03 Dec 2002

Priority date (day/month/year)

04 Dec 2001

Applicant

ARCH CHEMICALS, INC.

1. Where the International Searching Authority and the receiving Office are not the same Office:

The applicant is hereby notified that the search copy of the international application was received by this International Searching Authority on the date indicated below.

Where the International Searching Authority and the receiving Office are the same Office:

The applicant is hereby notified that the search copy of the international application was received on the date indicated below.

03 Jan 2003

(date of receipt)

2. ☐ The search copy was accompanied by a nucleotide and/or amino acid sequence listing in computer readable form.

3. Time limit for establishment of international search report

The applicant is informed that the time limit for establishing the international search report is 3 months from the date of receipt indicated above or 9 months from the priority date, whichever time limit expires later.

4. A copy of this notification has been sent to the International Bureau and, where the first sentence of paragraph 1 applies, to the receiving Office.

Name and mailing address of the ISA/

Assistant Commissioner for Patent, Box PCT
Washington, D.C. 20231 Attn: RO/US

Facsimile No. 703-305-3230

Authorized officer

Jeanette Washington

Telephone No. 703-305-3687

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Arch Chemicals, Inc.
a Corporation of the Commonwealth of Virginia, U.S.A.
501 Merritt 7
P.O. Box 5204
Norwalk, Connecticut 06856-5204
United States of America
Telephone No.: 203-229-2900
Facsimile No.: 203-229-2613

hereby appoints (appoint) the following person as: ☒ agent ☐ common representative

Name and address
(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

**CARLSON, Dale Lynn; GARABEDIAN, Todd E.; KINNEY, Michael K.;
NAPLES, Clement J.; ROSENBLATT, Gregory S.; SIMONS, William A.
WIGGIN & DANA LLP, One Century Tower, New Haven, Connecticut 06508-1832
United States of America
Telephone No. 203-498-4400
Facsimile No. 203-782-2889**

to represent the undersigned before

☒ all the competent International Authorities

☐ the International Searching Authority only

☐ the International Preliminary Examining Authority only

in connection with the international application(s) identified below:

Title of Invention	Applicant's or Agent's File Reference	International Application Number (If already available)
CHEMICAL FEEDER	102281-201	

filed with the following Office, US as Receiving Office and to make or receive payments on behalf of the undersigned.

Signature of the applicant(s) (where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power):

ARCH CHEMICALS, INC.

By: Sarah A. O'Connor
Sarah A. O'Connor
Vice President, General Counsel and Secretary

Date: 11.22.02

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) 102281-201

Box No. I TITLE OF INVENTION

CHEMICAL FEEDER

Box No. II APPLICANT

☐ This person is also inventor

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ARCH CHEMICALS, INC.
a Corporation of the Commonwealth of Virginia, U.S.A.
501 Merritt 7
P.O. Box 5204
Norwalk, Connecticut 06856-5204
United States of America

Telephone No.
203-229-2900

Facsimile No.
203-229-2613

Teleprinter No.

Applicant's registration No. with the Office

State (that is, country) of nationality:
US

State (that is, country) of residence:
US

This person is applicant for the purposes of:

☒ all designated States

☐ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

BLANCHETTE, David W.
87 Maplewood Road
Southington, Connecticut 06489
United States of America

This person is:

☐ applicant only

☐ applicant and inventor

☒ inventor only (if this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

SIMONS, William A.
WIGGIN & DANA LLP
One Century Tower
New Haven, Connecticut 06508-1832
United States of America

Telephone No.
203-498-4502

Facsimile No.
203-782-2889

Teleprinter No.

Agent's registration No. with the Office
27,096

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

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Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) ZETENA, Christopher M. 1735 Peachtree Street #333 Atlanta, Georgia 30309 United States of America		This person is: ☐ applicant only ☐ applicant and inventor ☒ inventor only (If this check-box is marked, do not fill in below.)
Applicant's registration No. with the Office		
State (that is, country) of nationality:	State (that is, country) of residence:	
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) PALOIAN, Michael Woodbury Road Cold Spring Harbor, New York 11724 United States of America		This person is: ☐ applicant only ☐ applicant and inventor ☒ inventor only (If this check-box is marked, do not fill in below.)
Applicant's registration No. with the Office		
State (that is, country) of nationality:	State (that is, country) of residence:	
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) ORCHARD, Anthony R. 583 San Hill Road Wantagh, New York 11793 United States of America		This person is: ☐ applicant only ☐ applicant and inventor ☒ inventor only (If this check-box is marked, do not fill in below.)
Applicant's registration No. with the Office		
State (that is, country) of nationality:	State (that is, country) of residence:	
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) 		This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.)
Applicant's registration No. with the Office		
State (that is, country) of nationality:	State (that is, country) of residence:	
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box		
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.		

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Box No. V DESIGNATION OF STATES

Mark the applicable check-boxes below; at least one must be marked.

The following designations are hereby made under Rule 4.9(a):

Regional Patent

- ☐ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZM Zambia, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT (if other kind of protection or treatment desired, specify on dotted line)
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, BG Bulgaria, CH & LI Switzerland and Liechtenstein, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, SK Slovakia, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GQ Equatorial Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | | |
|---|--|--|
| ☒ AE United Arab Emirates | ☒ GM Gambia | ☒ NZ New Zealand |
| ☒ AG Antigua and Barbuda | ☒ HR Croatia | ☒ OM Oman |
| ☒ AL Albania | ☒ HU Hungary | ☒ PH Philippines |
| ☒ AM Armenia | ☒ ID Indonesia | ☒ PL Poland |
| ☒ AT Austria | ☒ IL Israel | ☒ PT Portugal |
| ☒ AU Australia | ☒ IN India | ☒ RO Romania |
| ☒ AZ Azerbaijan | ☒ IS Iceland | ☒ RU Russian Federation |
| ☒ BA Bosnia and Herzegovina | ☒ JP Japan | |
| ☒ BB Barbados | ☒ KE Kenya | ☒ SD Sudan |
| ☒ BG Bulgaria | ☒ KG Kyrgyzstan | ☒ SE Sweden |
| ☒ BR Brazil | ☒ KP Democratic People's Republic of Korea | ☒ SG Singapore |
| ☒ BY Belarus | ☒ KR Republic of Korea | ☒ SI Slovenia |
| ☒ BZ Belize | ☒ KZ Kazakhstan | ☒ SK Slovakia |
| ☒ CA Canada | ☒ LC Saint Lucia | ☒ SL Sierra Leone |
| ☒ CH & LI Switzerland and Liechtenstein | ☒ LK Sri Lanka | ☒ TJ Tajikistan |
| ☒ CN China | ☒ LR Liberia | ☒ TM Turkmenistan |
| ☒ CO Colombia | ☒ LS Lesotho | ☒ TN Tunisia |
| ☒ CR Costa Rica | ☒ LT Lithuania | ☒ TR Turkey |
| ☒ CU Cuba | ☒ LU Luxembourg | ☒ TT Trinidad and Tobago |
| ☒ CZ Czech Republic | ☒ LV Latvia | |
| ☒ DE Germany | ☒ MA Morocco | ☒ TZ United Republic of Tanzania |
| ☒ DK Denmark | ☒ MD Republic of Moldova | ☒ UA Ukraine |
| ☒ DM Dominica | | ☒ UG Uganda |
| ☒ DZ Algeria | ☒ MG Madagascar | ☐ US United States of America |
| ☒ EC Ecuador | ☒ MK The former Yugoslav Republic of Macedonia | |
| ☒ EE Estonia | ☒ MN Mongolia | ☒ UZ Uzbekistan |
| ☒ ES Spain | ☒ MW Malawi | ☒ VN Viet Nam |
| ☒ FI Finland | ☒ MX Mexico | ☒ YU Yugoslavia |
| ☒ GB United Kingdom | ☒ MZ Mozambique | ☒ ZA South Africa |
| ☒ GD Grenada | ☒ NO Norway | ☒ ZM Zambia |
| ☒ GE Georgia | | ☒ ZW Zimbabwe |
| ☒ GH Ghana | | |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

- | | | |
|--------------------------------|--------------------------------|--------------------------------|
| ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application:* regional Office	international application: receiving Office
item (1) 04 December 2001	60/338,388	US		
item (2) 27 June 2002	60/392,727	US		
item (3) 02 December 2002	Unknown	US		
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items ☒ item (1) ☒ item (2) ☒ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / RO/US

Request to use results of earlier search; references to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
02 December 2002 (02.12.02)	Unknown	US

Box No. VIII DECLARATIONS

The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

Number of declarations

- | | | |
|---|--|---|
| ☐ Box No. VIII (i) | Declaration as to the identity of the inventor | : |
| ☐ Box No. VIII (ii) | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent | : |
| ☐ Box No. VIII (iii) | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | : |
| ☐ Box No. VIII (iv) | Declaration of inventorship (only for the purposes of the designation of the United States of America) | : |
| ☐ Box No. VIII (v) | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty | : |

Box No. IX CHECK LIST; LANGUAGE OF FILING

This international application contains:		This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item):		Number of items
(a) the following number of sheets in paper form:				
request (including declaration sheets)	: 5	1. ☒ fee calculation sheet	:	1
description (excluding sequence listing part)	: 15	2. ☒ original separate power of attorney	:	1
claims	: 7	3. ☐ original general power of attorney	:	
abstract	: 1	4. ☐ copy of general power of attorney; reference number, if any:	:	
drawings	: 20	5. ☐ statement explaining lack of signature	:	
Sub-total number of sheets	: 48	6. ☐ priority document(s) identified in Box No. VI as item(s):	:	
sequence listing part of description (actual number of sheets if filed in paper form, whether or not also filed in computer readable form; see (b) below)	:	7. ☐ translation of international application into (language):	:	
Total number of sheets	: 48	8. ☐ separate indications concerning deposited microorganism or other biological material	:	
(b) sequence listing part of description filed in computer readable form		9. ☐ sequence listing in computer readable form (indicate also type and number of carriers (diskette, CD-ROM, CD-R or other))	:	
(i) ☐ only (under Section 801(a)(i))		(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application)	:	
(ii) ☐ in addition to being filed in paper form (under Section 801(a)(ii))		(ii) ☐ (only where check-box (b)(i) or (b)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter	:	
Type and number of carriers (diskette, CD-ROM, CD-R or other) on which the sequence listing part is contained (additional copies to be indicated under item 9(ii), in right column):		(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing part mentioned in left column	:	
		10. ☒ other (specify): Transmittal Letter & Post Card	:	2
Figure of the drawings which should accompany the abstract: 5		Language of filing of the international application: English		

Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

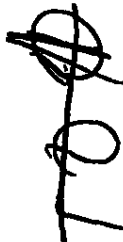
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).


 William A. Simons, Reg. No. 27,096
 Agent

For receiving Office use only		2. Drawings: ☐ received: ☐ not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. ☐ Transmittal of search copy delayed until search fee is paid	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

 *** TX REPORT ***

100 

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TX/RX NO	3247
CONNECTION TEL	901141227401435
CONNECTION ID	PCT EXAMEN III
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USAGE T	01'25
PGS. SENT	4
RESULT	OK

Wiggin & Dana

Counsellors at Law

Wiggin & Dana LLP

Telephone

One Century Tower

203.498.4400

P.O. Box 1832

Telefax

New Haven, Connecticut

203.782.2889

06508-1832

www.wiggin.com

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Date:

March 11, 2003

To / Company / Telefax:

Anman QIU - Authorized Officer

International Bureau of WIPO

9+011+41+22+740.14.35

From:

William A. Simons

Telephone / Email:

203.498.4502 / wsimons@wiggin.com

Client / matter code:

12800/633

Please copy:

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Special Instructions:

Applicant: ARCH CHEMICALS, INC.

International Application No. PCT/US02/38824

File Reference: 102281-201

Enclosed are:

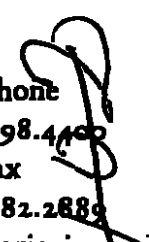
Response to Invitation to Correct Priority Claim - 2 Pages

Replacement Page 4 of Request - 1 Page

Wiggin & Dana

Counsellors at Law

Wiggin & Dana LLP
One Century Tower
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New Haven, Connecticut
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Date:

March 11, 2003

To / Company / Telefax:

**Anman QIU – Authorized Officer
International Bureau of WIPO
9+011+41+22+740.14.35**

From:

William A. Simons

Telephone / Email:

203.498.4502 / wsimons@wiggin.com

Client / matter code:

12800/633

Please copy:

We will copy:

Special Instructions:

**Applicant: ARCH CHEMICALS, INC.
International Application No. PCT/US02/38824
File Reference: 102281-201**

Enclosed are:

**Response to Invitation to Correct Priority Claim – 2 Pages
Replacement Page 4 of Request – 1 Page**

3 page(s) following this page

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT COOPERATION TREATY

102
32
101

In re Application of : ARCH CHEMICALS, INC.

International Application No. : PCT/US02/38824

Filed : 03 DECEMBER 2002

For : CHEMICAL FEEDER

Corresponding to United States

Provisional Application : 60/338,386 : Filed: 04 DECEMBER 2001

Corresponding to United States

Provisional Application : 60/392,727 : Filed: 27 JUNE 2002

Corresponding to United States

Patent Application : 10/307,71 : Filed: 02 DECEMBER 2002

Attention : Anman QIU
Authorized Officer

**RESPONSE TO INVITATION TO CORRECT
PRIORITY CLAIM UNDER PCT RULES 4.10, 26bis.1,
26bis.2(a) and (b)**

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Dear Sir:

This is in response to the Invitation To Correct Priority Claim with a Date of Mailing of 20 February 2003, and having a statutory period for response set to expire on 03 April 2003. Specifically, the International Bureau asked that Applicant identify the Serial Number and proper date of the third priority U.S. patent application claimed in the Priority Claim of the Request (Box Nos. VI and VII).

10³
101

In response to that invitation, please find attached a replacement Page 4 of the Request that now sets forth the Serial Number and proper date of that third priority U.S. patent application claimed, namely, U.S. Patent Application Serial No. 10/307,671 filed on 02 December 2002 (02.12.02).

At the time this PCT Application was filed that Serial Number was not known to Applicants or the undersigned Agent/Attorney for the Applicants.

If the International Bureau requires any additional information, it is invited to contact Applicants' Agent and Attorney at the telephone number listed below.

A copy of this letter is being sent to the US Receiving Office.

Respectfully submitted,

Enclosure

ARCH CHEMICALS, INC.

Date:

March 11, 2003

William A. Simons

William A. Simons
Agent and Attorney for Applicant
Reg. No. 27,096

cc- Attention: RO/US
Box PCT
Commissioner for Patents
Washington, D.C. 20231

WIGGIN & DANA LLP
ONE CENTURY TOWER
NEW HAVEN, CT 06508
+1-203-498-4502 Voice
+1-203-782-2889 Facsimile

\\12800\\633\\391429.1

Box No. VI PRIORITY CLAIM

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 04 December 2001 (04.12.01)	60/338,386	US		
item (2) 27 June 2002 (27.06.02)	60/392,727	US		
item (3) 02 December 2002 (02.12.02)	10/307,671	US		
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items
 ☒ item (1)
 ☒ item (2)
 ☒ item (3)
 ☐ item (4)
 ☐ item (5)
 ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / RO/US

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
02 December 2002 (02.12.02)	10/307,671	US

Box No. VIII DECLARATIONS

The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

Number of declarations

- | | | |
|---|--|---|
| ☐ Box No. VIII (i) | Declaration as to the identity of the inventor | : |
| ☐ Box No. VIII (ii) | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent | : |
| ☐ Box No. VIII (iii) | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | : |
| ☐ Box No. VIII (iv) | Declaration of inventorship (only for the purposes of the designation of the United States of America) | : |
| ☐ Box No. VIII (v) | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty | : |

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Counsellors at Law

Wiggin & Dana LLP
 One Century Tower
 P.O. Box 1832
 New Haven, Connecticut
 06508-1832

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T E L E F A X T R A N S M I T T A L

Date:

March 11, 2003

To / Company / Telefax:

Anman QIU - Authorized Officer
 International Bureau of WIPO
 9+011+41+22+740.14.35

From:

William A. Simons

Telephone / Email:

203.498.4502 / wsimons@wiggin.com

Client / matter code:

12800/633

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Special Instructions:

CORRECTION

Applicant: ARCH CHEMICALS, INC.

International Application No. PCT/US02/38824

File Reference: 102281-201

Enclosed are:

Response to Invitation to Correct Priority Claim - 2 Pages

Replacement Page 4 of Request - 1 Page

Wiggin & Dana

Counsellors at Law

Wiggin & Dana LLP
One Century Tower
P.O. Box 1832
New Haven, Connecticut
06508-1832

Telephone
203.498.4400
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TELEFAX TRANSMITTAL

Date:

March 11, 2003

To / Company / Telefax:

Anman QIU – Authorized Officer
International Bureau of WIPO
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From:

William A. Simons

Telephone / Email:

203.498.4502 / wsimons@wiggin.com

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12800/633

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Special Instructions:

CORRECTION

Applicant: ARCH CHEMICALS, INC.

International Application No. PCT/US02/38824

File Reference: 102281-201

Enclosed are:

Response to Invitation to Correct Priority Claim – 2 Pages

Replacement Page 4 of Request – 1 Page

3 page(s) following this page

107
107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT COOPERATION TREATY

In re Application of : ARCH CHEMICALS, INC.
International Application No. : PCT/US02/38824
Filed : 03 DECEMBER 2002
For : CHEMICAL FEEDER

Corresponding to United States
Provisional Application : 60/338,386 : Filed: 04 DECEMBER 2001
Corresponding to United States
Provisional Application : 60/392,727 : Filed: 27 JUNE 2002
Corresponding to United States
Patent Application : 10/307,671 : Filed: 02 DECEMBER 2002

Attention : Anman QIU
Authorized Officer

**RESPONSE TO INVITATION TO CORRECT
PRIORITY CLAIM UNDER PCT RULES 4.10, 26bis.1,
26bis.2(a) and (b)**

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Dear Sir:

This is in response to the Invitation To Correct Priority Claim with a Date of Mailing of 20 February 2003, and having a statutory period for response set to expire on 03 April 2003. Specifically, the International Bureau asked that Applicant identify the Serial Number and proper date of the third priority U.S. patent application claimed in the Priority Claim of the Request (Box Nos. VI and VII).



In response to that invitation, please find attached a replacement Page 4 of the Request that now sets forth the Serial Number and proper date of that third priority U.S. patent application claimed, namely, U.S. Patent Application Serial No. 10/307,671 filed on 02 December 2002 (02.12.02).

At the time this PCT Application was filed that Serial Number was not known to Applicants or the undersigned Agent/Attorney for the Applicants.

If the International Bureau requires any additional information, it is invited to contact Applicants' Agent and Attorney at the telephone number listed below.

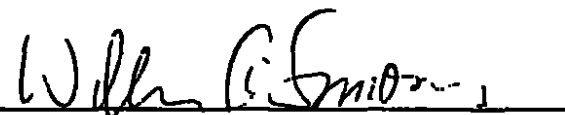
A copy of this letter is being sent to the US Receiving Office.

Respectfully submitted,

Enclosure

ARCH CHEMICALS, INC.

Date: March 11, 2003


William A. Simons
Agent and Attorney for Applicant
Reg. No. 27,096

cc- Attention: RO/US
Box PCT
Commissioner for Patents
Washington, D.C. 20231

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+1-203-782-2889 Facsimile

\\2800\\633\\391429.1

109

Box No. VI PRIORITY CLAIM

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application:* regional Office	international application: receiving Office
item (1) 04 December 2001 (04.12.01)	60/338,386	US		
item (2) 27 June 2002 (27.06.02)	60/392,727	US		
item (3) 02 December 2002 (02.12.02)	10/307,671	US		
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items ☒ item (1) ☒ item (2) ☒ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / RO/US

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
02 December 2002 (02.12.02)	10/307,671	US

Box No. VIII DECLARATIONS

The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

Number of
declarations

- | | | |
|---|--|---|
| ☐ Box No. VIII (i) | Declaration as to the identity of the inventor | : |
| ☐ Box No. VIII (ii) | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent | : |
| ☐ Box No. VIII (iii) | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | : |
| ☐ Box No. VIII (iv) | Declaration of inventorship (only for the purposes of the designation of the United States of America) | : |
| ☐ Box No. VIII (v) | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty | : |

*** TX REPORT ***

TRANSMISSION OK

TX/RX NO 1334
CONNECTION TEL 917033053230
CONNECTION ID
ST. TIME 01/14 15:33
USAGE T 00'43
PGS. SENT 3
RESULT OK

Wiggin and Dana LLP 203.498.4400
One Century Tower 203.782.2889 fax
P.O. Box 1832 www.wiggin.com
New Haven, Connecticut
06508-1832

WIGGIN AND DANA
Counsellors at Law

Telefax Transmittal

Date:

January 14, 2004

To / Company / Telefax:

Kevin L. Lee (Authorized Officer) / US Patent Cooperation Treaty Receiving Office /
703-305-3230

From:

William A. Simons

Telephone / Email:

203.498.4502 / wsimons@wiggin.com

Client / matter code:

12800 / 633

Please copy:

We will copy:

Special Instructions

In re application of Arch Chemicals, Inc.
Applicant's File Ref.: 102281-201
PCT Serial No. PCT/US02/38824

This message is intended for the use
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New Haven, Connecticut
06508-1832

203.498.4400
203.782.2889 fax
www.wiggin.com

111
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WIGGIN AND DANA
Counsellors at Law

Telefax Transmittal

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Client / matter code:

12800 / 633

Please copy:

We will copy:

Special Instructions

In-re application of Arch Chemicals, Inc.
Applicant's File Ref.: 102281-201
PCT Serial No.: PCT/US02/38824
International Filing Date: 03 December 2002
Priority Date: 04 December 2001
Title: Chemical Feeder

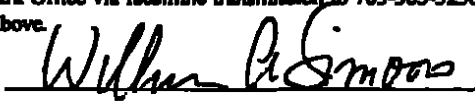
Enclosure: Request for IPER (2 pages)

2 page(s) following this page

This message is intended for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential and exempt from disclosure. If the reader of this message is not the intended recipient or an employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this message is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and return the original message to us by mail. Thank you.

112
3
F**IN THE UNITED STATES PATENT COOPERATION TREATY RECEIVING
OFFICE (RO/US)**

In re application of: Arch Chemicals, Inc. Applicant's File Ref.: 102281-201
PCT Serial No.: PCT/US02/38824
International Filing Date: 03 December 2002 (03.12.2002) Priority Date: 04 December 2001 (04.12.2001)
Title: CHEMICAL FEEDER
Attn: Kevin L. Lee (Authorized Officer)

Certificate of Facsimile Transmission	
Date of Transmission:	January 14, 2004
I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being filed with the United States Patent and Trademark Office via facsimile transmission to 703-305-3230 on the date shown above.	
Signed:	
Name: William A. Simons	

REQUEST FOR IPER

Mail Stop PCT, Attn: IPEA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This letter is to advise the U.S. Receiving Office (RO/US) that Applicant has made no response, and will make no response, to the Written Opinion dated 18 September 2003.

The RO/US is respectfully requested to send the International Preliminary Examination Report (IPER) as soon as possible.

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X

If you have any questions, please feel free to contact the undersigned attorney for applicant.

Respectfully submitted,
Arch Chemicals, Inc.

William A. Simons

Signature of Attorney
William A. Simons
Wiggin and Dana LLP
One Century Tower
New Haven, CT 06508-1832
Telephone: (203) 498-4502
Facsimile: (203) 782-2889

Date: January 14, 2004
Reg. No. 27,096

\\2800\\633\\444674.1

Brigard & Castro

BOGOTA - COLOMBIA

PODER

POWER F ATTORNEY

Yo (nosotros)

I (We) ARCH CHEMICALS, INC., a corporation organized and existing under the laws of the Commonwealth of Virginia, U.S.A.

domiciliado(s) en

domicled In 501 Merritt 7, P.O. Box 5204, Norwalk, Connecticut 06856-5204, U.S.A.

Nombro(amos) a: RAMIRO CASTRO DUQUE y/o HECTOR GOMEZ MEJIA, de Bogotá, Colombia, apoderados verdaderos y legales con poder especial, amplio y suficiente, para recabar de las oficinas y autoridades colombianas administrativas, judiciales y de policía, en cualquier instancia o recurso, la obtención de patentes de invención, registros de marcas, diseños industriales, modelos de utilidad, depósitos de nombres comerciales y enseñanzas, registros de derechos de autor y contratos sobre los mismos, obtención de certificados de obtentor de variedades vegetales, así como sus prórrogas, renovaciones, anotaciones de traspaso, cambios de nombre y/o domicilio; elaborar, tramitar y registrar contratos de licencia y licencias de cualesquiera clases; intervenir como demandante o como demandado en cualquier instancia y recurso ante cualquier juez, corporación, funcionario público o autoridad en acciones judiciales, administrativas y de policía tales como: oposiciones al registro de marcas; acciones de caducidad, cancelación y nulidad; acciones reivindicatorias, acciones derivadas de la obtención o explotación de licencias; acciones de competencia desleal; demandas penales; acciones de indemnización de perjuicios, reclamos y observaciones a solicitudes de patentes, diseños industriales, modelos de utilidad, en el ejercicio de medidas cautelares y en otras acciones o medidas similares.

Heraby appoint RAMIRO CASTRO DUQUE and/or HECTOR GOMEZ MEJIA, of Bogotá, Colombia, my (our) true and lawful attorneys with special, ample and sufficient power to obtain from the Colombian administrative, judicial and police offices and authorities, in any instance, privileges of patents of invention, registration of trademarks, industrial designs and utility models; registration of commercial names and emblems, registration of copyright and contracts related thereto, certificates of obtainers of vegetables varieties, as well as extensions, renewals and recordal of assignments and changes of name and domicile related to the above; to prepare, prosecute and register licenses of any kind; to act as plaintiff or defendant in any instance or recourse, and before any judge, corporation, public official or authority in judicial, administrative and police actions, such as: oppositions to the registration of trademarks; caducity, cancellation and nullity actions; claim actions derived from the obtaining or exploitation of licenses, action of unfair competition; penal demands, actions of indemnities for damages; claims or observations on patent applications, models, industrial designs and utility models; in the exercise of preventive measures; and in other actions or similar proceedings.

A este efecto, lo(s) faculto(amos) para elevar solicitudes, formular descripciones, enmiendas, protestas, declaraciones, oposiciones, cancelaciones, nulidades, apelaciones y reclamos; pagar impuestos, cuotas y gravámenes prescritos por la ley; renunciar o desistír a derechos concedidos o en curso de concesión; recibir toda clase de documentos y valores, dando el descargo respectivo, y, en general, para dar ante dichas autoridades todos los pasos necesarios al efecto indicado y tomar todas las medidas que creyeren conducentes al resguardo de mis (nuestros intereses), con todas las demás facultades legales necesarias.

To that effect they hereby empowered to file applications, formulate descriptions, amendments, protests, declarations, oppositions, cancellations, nullities, appeals and claims; to pay taxes, quotas and assessments prescribed by law, renounce or waive the rights granted or in the process of granting; to receive all kinds of documents and valuables, giving the respective release of receipt, and, in general, to take before said authorities the necessary steps to such effect, and any measures that they may deem pertinent to the safeguard of my (our) interest(s) with all the other necessary legal powers.

Este poder comprende la facultad de ratificar o confirmar en mí (nuestro) nombre lo actuado así como la facultad de desistír, transigir, comprometer, y la de sustituirlo en todo o en parte y revocar sustituciones. Asimismo nombro(amos) a: RAMIRO CASTRO DUQUE y/o HECTOR GOMEZ MEJIA, domiciliado(s) en la Carrera 7 No. 16-56 Piso 9, mis (nuestros) apoderados en Colombia, con facultades para recibir notificaciones y designar apoderados judiciales o extrajudiciales.

This power includes the faculty to ratify or confirm desist, settle and compromise on my (our) behalf, and to substitute this power in whole or in part and to revoke substitutions. At the same time I (We) hereby appoint RAMIRO CASTRO DUQUE and/or HECTOR GOMEZ MEJIA, domicled in Carrera 7 No. 16-56, Piso 9, my (our) attorney(s) in fact, with powers to receive notifications and to designate judicial and extrajudicial attorneys.

Otorgado y firmado en

Granted and signed in Norwalk, Connecticut, U.S.A.

hoy de de

this 10 day May of 2004

Firma

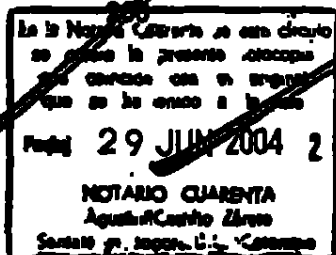
Signature

Nombre

Name

Cargo

Title



ARCH CHEMICALS, INC.

Paul J. Crapley
Executive Vice President

APOSTILLE

(Convention de La Haye du 5 octobre 1961)

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1. Country: The United States of America

THIS PUBLIC DOCUMENT

2. has been signed by **NANCY O. STEVENS**

3. acting in the capacity of **NOTARY PUBLIC**

4. in the State of Connecticut for the term of **June 21, 2001 to June 30, 2006**

CERTIFIED

5. at **Hartford, Connecticut**

6. on **May 14, 2004**

7. by **SUSAN BYSIEWICZ** Secretary of the State of Connecticut

8. Number : **2004-5025**

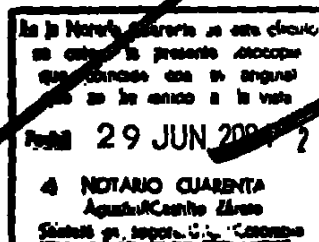
9. Seal :



10. Signature

Susan Bysiewicz

Secretary of the State



I PAUL J. CRANEY Certify:

That ARCH CHEMICALS, INC.
is a Corporation duly organized and legally
existing under the laws of the Commonwealth
of Virginia, U.S.A.

That the domicile of said Corporation
is 501 Merritt 7
P.O. Box 5204
Norwalk, Connecticut 06856-5204
U.S.A.

I, further certify that I am duly authorized to
sign the forgoing instrument in the name of said
corporation and that the purposes for which said
instrument is granted are within the scope of the
objects or activities of said corporation,
in accordance with the Articles of Amendment &
Restatement of the Articles of Incorporation,
issued in the City of Richmond, Virginia, U.S.A.
and filed February 3, 1999.

Signed in Norwalk, Connecticut, U.S.A.

Dated: 10 May, 2004

Paul J. Craney
Paul J. Craney
Executive Vice President

STATE OF CONNECTICUT)

COUNTY OF FAIRFIELD)

On this 10th day May, 2004, before me a
Notary Public in and for said county and State, personally
appeared PAUL J. CRANEY, who acknowledged himself to be the
Executive Vice President of ARCH CHEMICALS, INC., and that he as
such Executive Vice President, being authorized so to do,
executed the foregoing instrument for the purposes therein
contained, by signing the name of the corporation by himself as
Executive Vice President.

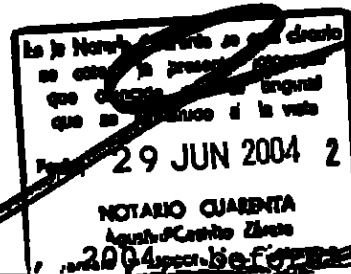
In witness whereof I hereunto set my hand.

Nancy L. Stevens
Notary Public

Seal:

My Commission Expires:

My Commission Exp. June 30, 2008



TRADUCCION DE LOS SELLOS QUE SE ENCUENTRAN EN EL PODER
OTORGADO POR ARCH CHEMICALS, INC., UNA COMPAÑIA DOMICILIADA
EN 501 Merritt 7, P.O. Box 5204, NORWALK, CONNECTICUT
06856-5204, ESTADOS UNIDOS DE AMÉRICA, A LOS DOCTORES
RAMIRO CASTRO DUQUE Y/O HECTOR GOMEZ MEJIA.

ORTORGADO Y FIRMADO EL 10 DE MAYO DE 2004

FIRMADO: PAUL J. CREANEY, VICEPRESIDENTE EJECUTIVO.

Yo, PAUL J. CRANEY CERTIFICO:

Que ARCH CHEMICALS, INC., es una Corporación debidamente
organizada y en existencia bajo las leyes del Estado de
Virginia, Estados Unidos de América.

Que el domicilio de la Corporación es:

501 Merritt 7, P.O.BOX 5204

Norwalk, Connecticut 06856-5204

Estados Unidos de América

Certifico además que estoy debidamente autorizado para
firmar el instrumento adjunto a nombre de dicha
Corporación, y que los fines para los cuales se otorga
dicho instrumento se encuentran dentro del alcance de los
objetos o actividades de dicha Corporación, de conformidad
con los Artículos de Modificación y Actualización de los
Artículos de Constitución, expedidos en la ciudad de
Richmond, Virginia, Estados Unidos de América, y radicados
el 3 de Febrero, 1999.

Firmado en Norwalk, Connecticut, Estados Unidos de América.

Fecha: 10 de Mayo de 2004.

FIRMADO: PAUL J. CRANEY, VICEPRESIDENTE EJECUTIVO.



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ESTADO DE CONNECTICUT - CONDADO DE FAIRFIELD

Este día 10 de Mayo de 2004 ante mí, Notario Público en y para dichos Condado y Estado, personalmente comparecio PAUL J. CRANEY, a quien conozco y reconoció que es el Vicepresidente Ejecutivo de ARCH CHEMICALS, INC., y que en su calidad de Vicepresidente Ejecutivo, debidamente autorizado para hacerlo, ejecutó el instrumento adjunto para los fines allí especificados, y al firmar a nombre de la Corporación en su nombre en su calidad de Vicepresidente Ejecutivo.

En testimonio de lo anterior firmo el presente documento

FIRMADO: NANCY O. STEVENS, NOTARIO PUBLICO, CON COMISIÓN
HASTA EL 30 DE JUNIO DE 2006.

HAY SELLO EN RELIEVE DEL NOTARIO.



119 *[Handwritten signature]*

APOSTILLA

CONVENIO DE LA HAYA DEL 5 DE OCTUBRE DE 1961

1. PAIS: ESTADOS UNIDOS DE AMERICA

EL PRESENTE DOCUMENTO PUBLICO

2. HA SIDO FIRMADO POR: NANCY O. STEVENS

3. ACTUANDO EN SU CAPACIDAD DE: NOTARIO PUBLICO

4. EN EL ESTADO DE CONNECTICUT POR UN TERMINO DE 21 DE
JUNIO, 2001 A 30 DE JUNIO, 2006

CERTIFICADO

5. EN: HARTFORD, CONNECTICUT

6. EL: 14 DE MAYO DE 2004

7. POR: SUSAN BYSIEWICZ, SECRETARIO DE ESTADO DE
CONNECTICUT

8. BAJO EL NO.: 2004-5025

9. SELLO: ESTADO DE CONNECTICUT

10. FIRMADO: SUSAN BYSIEWICZ, SECRETARIO DE ESTADO.

LA TRADUCTORA OFICIAL

[Handwritten signature of Helena Uribe de Lemoine]

HELENA URIBE DE LEMOINE

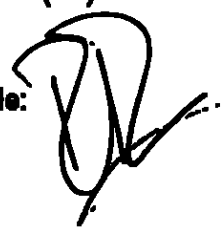


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120

REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL
TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION ✓	()	(✓)
MODELO DE UTILIDAD	()	()
- Indicación de que se solicita la concesión de una patente.	()	(✓)
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	(✓)
- Descripción de la invención.	()	()
- Dibujos de ser estos pertinentes.	()	(✓)
- Comprobante de Pago de las tasas establecidas.	()	()
COMPLETA (✓)	INCOMPLETA ()	()
DISEÑO INDUSTRIAL ()		
- Indicación de que se solicita el registro de Diseño Industrial	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica o fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
- Comprobante de pago de las tasas establecidas	()	()
COMPLETA ()	INCOMPLETA ()	()
ESQUEMA DE TRAZADO ()		
- Indicación de que solicita el registro de un Esquema de trazado.	()	()
- Datos de identificación del solicitante o de la persona que presenta La solicitud.	()	()
- Representación gráfica del esquema de trazado	()	()
- Comprobante de pago de las tasas establecidas.	()	()
COMPLETA ()	INCOMPLETA ()	()

Firma Responsable:



Fecha:

121

2020
Bogotá D C

Doctor(a)
RAMIRO CASTRO DUQUE.
Apoderado(a)

Oficio N° 00892

ASUNTO:	Radicación N°	04-62949
	Solicitud internacional	PCT/US02/38824
	Fecha inicio fase nacional	04/07/2004
	Trámite	011
	Evento	379
	Actuación	416
	Oficio N°	
	Folios	001

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

- La solicitud no contiene copia del documento en que consta la cesión del derecho de patente del inventor al solicitante o a su causante (Art. 26-k) Decisión 486).

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista de fecha, 202051