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Hartunian

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[54] **CLEANING VEHICLE**

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[52] **U.S. Cl.** ..... **239/186,** 15/21 E, 15/50 C, 134/45, 239/227

[51] **Int. Cl.** **B05b 3/18**

[58] **Field of Search** ..... 15/1, 7, 21 R, 50 R, 21 E, 15/50 C, 56, 98, 53; 134/45, 167 R; 239/227, 184, 186

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[57] **ABSTRACT**

A cleaning vehicle for cleansing the internal surfaces of a totally or partially enclosed chamber. The vehicle includes a base frame having a plurality of wheels driven by a reversible drive mechanism. The vehicle is adapted to be displaced reversibly in a longitudinal direction contiguous to a base surface. A spray mechanism is mounted to the base frame for ejecting liquid to the internal surfaces of the enclosing chamber. The spray mechanism is rotatively moveable with respect to the base frame in at least two planes of motion. A pair of guide mechanisms are mounted on opposing sides of the base frame for aligning the vehicle with respect to opposing transverse walls of the enclosing chamber during the longitudinal displacement of the cleaning vehicle.

28 Claims, 3 Drawing Figures

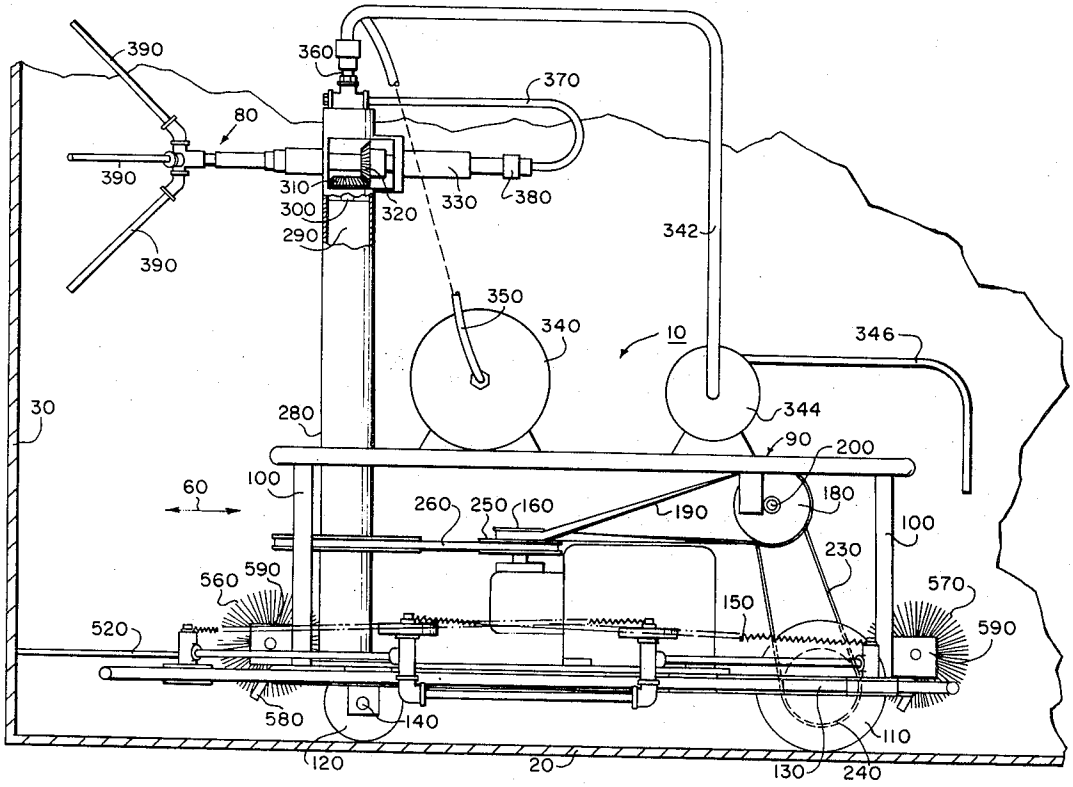


FIG. 1

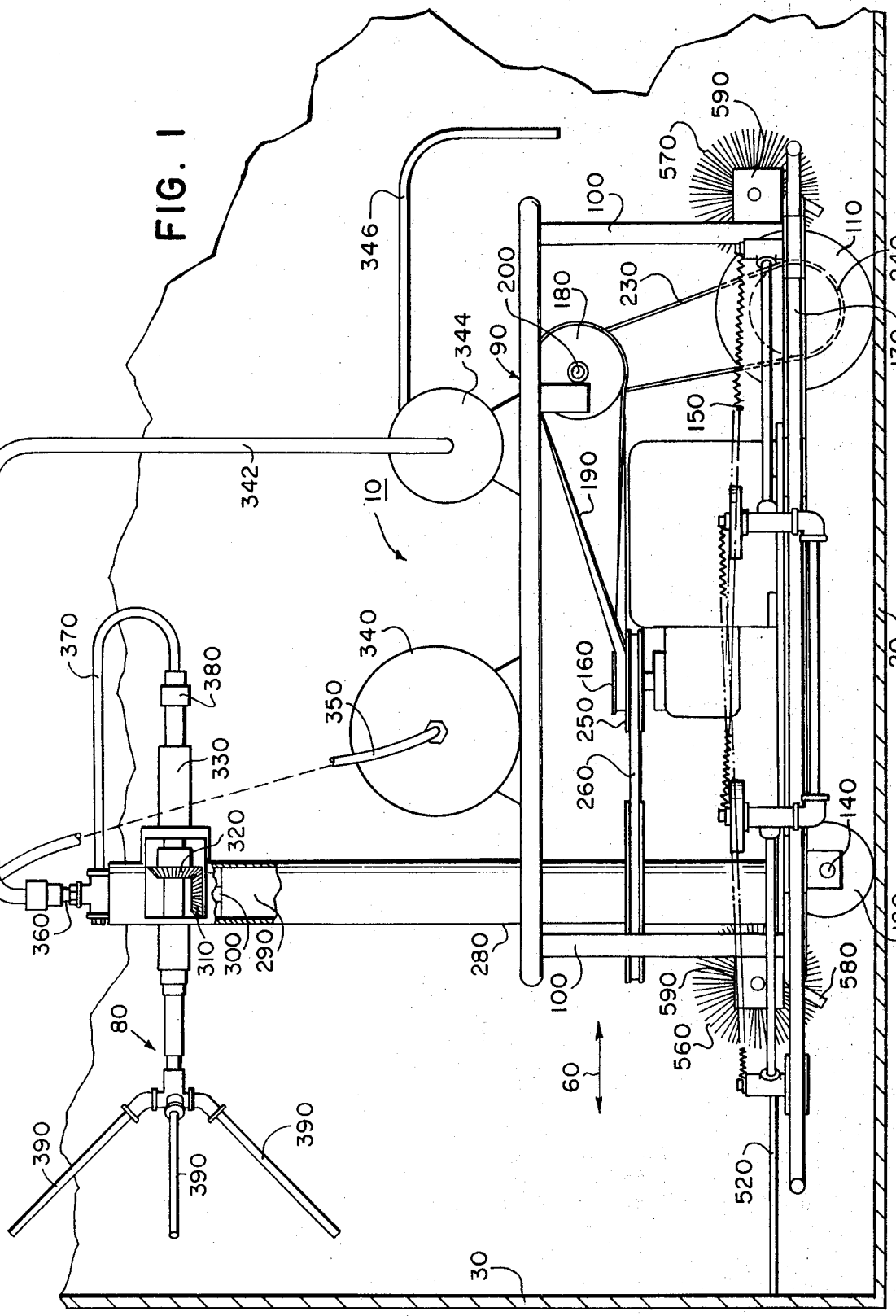
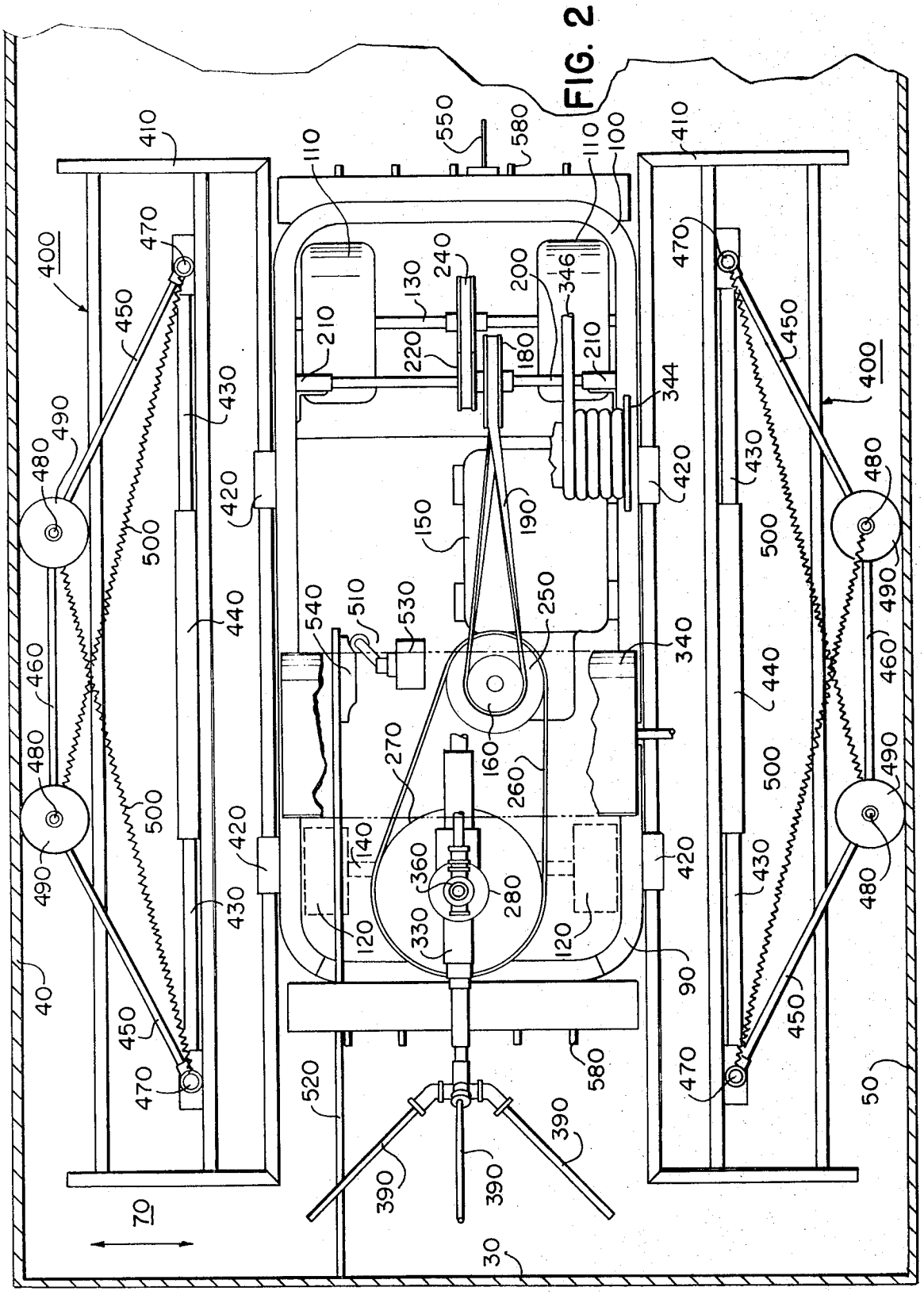

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344
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340
370
380
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320
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310
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570
590
110
240
130
150
190
160
250
260
140
120
580
560
590
60
80
390
390
390
390
520
30
20
10

FIG. 2


400
410
470
450
430
490
480
420
500
440
460
40
50
70
110
100
550
580
130
240
200
346
210
220
180
344
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260
140
360
280
330
120
90
520
390
30

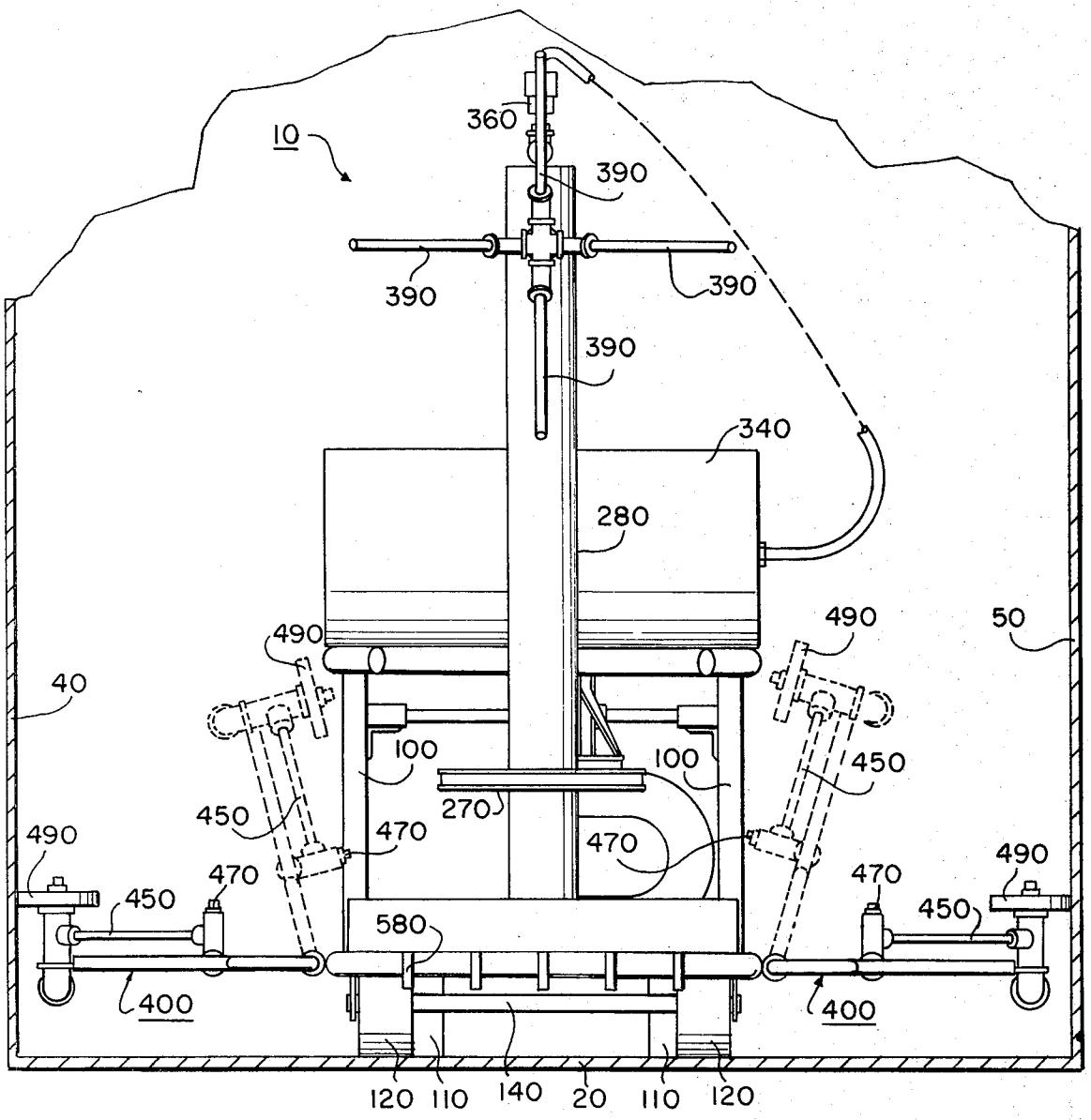

10
360
390
390
390
390
340
280
490
490
50
40
100
100
450
450
270
490
470
470
470
490
450
450
580
400
400
120
110
140
20
110
120

FIG. 3

CLEANING VEHICLE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to cleaning vehicles. In particular, this invention relates to cleaning vehicles having spray mechanisms for ejecting cleansing compounds to the internal surfaces of a totally or partially enclosed chamber. More in particular, this invention pertains to a cleaning vehicle adapted to translate in a predetermined direction within the enclosing chamber while being aligned with respect to opposing transverse walls of the enclosure.

2. Prior Art

Cleaning vehicles are known in the prior art. However, many prior cleaning devices do not provide spray mechanisms which are rotatively moveable in at least two planes of motion when spraying the internal surfaces of an enclosing chamber. These mechanisms do not reach all areas of the internal surfaces needing a cleansing action and therefore result in a partially cleaned inner surface area.

Other systems for cleaning internal wall surfaces provide for manual drive. Where an operator is needed to drive the cleaning mechanism, the temperature and corrosive nature of the cleansing compound is necessarily restricted. Additionally such cleaning apparatus is costly to operate in light of the added labor costs.

In prior cleaning mechanisms alignment problems are found where the mechanism deviates from a predetermined path restriction. Such cleaning apparatus do not provide for guide mechanisms which maintain the vehicle path movement within a predetermined contour.

Additionally, other cleaning vehicles may be automatically driven through a motor drive mechanism. However, such vehicles do not provide reverse cycles in order that the vehicle may be driven through the cleaning area a plurality of times. Such prior cleaning apparatus tend to leave certain internal wall surfaces dirty thereby lowering overall cleaning effectiveness.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a cleaning apparatus adapted to cleanse the inner surfaces of a partially or totally enclosed chamber.

Another object of the instant invention is to provide a cleaning apparatus which systematically cleanses all surfaces of an enclosing chamber.

A still further object of the present invention is to provide a cleaning apparatus which is automatically operable within an enclosing chamber.

Another object of the instant invention is to provide a cleaning apparatus which includes a spray mechanism mounted to the apparatus base frame and rotatively moveable in at least two planes with respect thereto.

A cleaning vehicle which is adapted to translate in a longitudinal direction contiguous with a base surface. The vehicle includes a base frame having a plurality of wheel members for translating the cleaning vehicle. A drive mechanism is mounted to the base frame and is operatively connected to the wheel members. A spray mechanism is mounted to the base frame and ejects liquid to the surrounding environment of the vehicle. The spray mechanism is rotatively moveable with respect to the base frame in at least two planes in motion. Guide mechanisms mounted to the base frame align the vehicle transverse the longitudinal direction with respect to opposing transverse boundary walls external to the vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of the cleaning apparatus showing the vehicle contacting a front wall of an enclosing chamber;

FIG. **2** is a top view of the cleaning vehicle showing the vehicle in spaced relation to the front and opposing transverse sidewalls; and,

FIG. **3** is a front view of the cleaning vehicle showing the guiding mechanisms in operational displacement and in a stored mode as depicted in the phantom line drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1, 2,** and **3** there is as shown a cleaning vehicle or truck cleaning assembly **10** for cleansing the interior boundary walls of a completely or partially enclosed container. In particular, cleansing vehicle **10** is used to clean the interior of a truck body comprising base plane, surface, or floor **20,** forward vertical wall **30,** opposing transverse vertical walls **40, 50,** as well as the standard ceiling section of any enclosing member or truck body. As will be described in the following paragraphs, vehicle assembly **10** is adapted to translate in longitudinal direction **60** contiguous with base surface or floor **20.** During traverse of a predetermined cyclical path, assembly **10** provides a high pressure stream of liquid, steam, detergent material or like cleaning composition for cleansing the interior walls **20, 30, 40,** and **50** of the enclosing chamber. Additionally, truck cleaning assembly **10** will be seen to accomplish a scrubbing action as well as a high pressure spray action on floor or base plane **20** during a longitudinal traverse. Cleaning vehicle **10** will automatically high pressure wash or generally clean the interior of large trailers and smaller delivery trucks which become contaminated and is of special use in those truck bodies transporting meat and general food products. Although not of critical importance to the invention, the overall dimensions of vehicle **10** approximate: 3.5 feet longitudinally, 2.5 feet transversely and 4 feet in vertical height.

Base frame **90** includes a series of horizontal and vertical tubular members **100** welded or otherwise securely fastened as is shown in FIGS. **1** and **2,** in order to provide a suitable mounting assembly for the various components of vehicle **10.** Tubular members **100** are constructed of stainless steel, steel pipe or some like material sufficient in structural integrity to maintain the weight of the various components to be described in the following paragraphs. A pair of rear wheels **110,** as shown in FIG. **2,** are rigidly mounted to rear wheel shaft **130** which is rotatively connected to opposing transverse sides of a pair of longitudinally directed tubular members **100.** Forward wheels **120** are similarly mounted to forward wheel shaft **140** as is shown. In this manner, vehicle **10** may be displaced in longitudinal direction **60** in either a forward or rearward motion.

Actual automatic displacement of vehicle **10** is provided through drive means, motor mechanism, or reversible DC motor **150.** Motor shaft **170,** adapted to rotate in a horizontal plane, is rigidly secured to dis-

placement pulley **160** as is shown in FIG. **1.** Pulley **160,** also rotating in the horizontal plane, is attached to intermediate pulley **180** through endless belt **190.** Intermediate pulley **180** is adapted to rotate in a plane normal to the rotation plane of displacement pulley **160.** Pulley **180** is rigidly mounted through bolts or some like techniques to intermediate pulley shaft **200** which is rotatively moveable with respect to base frame **90.** As is seen, pulley shaft **200** is mounted to opposing transverse tubular members **100** at transverse bearing ends **210,** as is seen in FIG. **2.** Secondary displacement pulley **220** is securely mounted to intermediate pulley shaft **200** in a manner similar to that seen for intermediate pulley **180.** Pulley **220** is operatively connected to wheel shaft pulley **240** through endless belt **230.** Wheel shaft pulley **240** in turn, is mounted to rear wheel shaft **130** in a constrained manner. As is seen, pulley members **180, 220,** and **240** all rotate in parallel planes substantially normal to base surface **20.** In the manner shown, actuation of a motor mechanism, or reversible DC motor **150** thus results in a corresponding rotation of rear wheels **110** to drive assembly **10** in a longitudinal direction **60** in either a forward or rearward displacement.

Spray mechanism **80** for ejecting liquid, fluid, high pressure vapor or other cleaning compositions to the surrounding boundary environment of vehicle **10** is mounted to base frame **90** and rotatively moveable in at least two planes with respect thereto. Actuation of spray mechanism or fluid ejection means **80** is initiated through rotation of spray drive pulley **250** which is rigidly attached to motor shaft **170.** Rotation of motor shaft **170** causes a similar plane rotation of drive pulley **250** which correspondingly operates tube pulley **270** through connecting belt **260.** Rotation of tube pulley **270** in a plane substantially parallel to base surface **20** forces a corresponding rotation of tube member **280.** Pulley **270** is rigidly secured to tube member **280** in order to cause corresponding rotation between these elements. Element **280** is vertically mounted and rotatable with respect to base frame **90** at a lowermost end thereof. Tube member **280** extends substantially vertical from base frame **90** and defines the vertically directed tube through passage **290,** as is shown. As has been described, pulley member **270** therefore passes contiguous to an external boundary wall of tube member **280** and is rigidly secured thereto in order to provide corresponding rotation in both members. Vertical rod member **300** passes substantially central to tube through passage **290** in a vertical manner as is shown. Further, rod member **300** is substantially constrained with respect to base frame **90.** Therefore, rotation of member **280** does not cause a corresponding rotation of vertical rod member **300.** First bevel gear **310** is secured to an upper end of rod member **300** and is thus fixedly secured to base frame **90.** Second bevel gear **320** is meshed to gear **310** and is rotationally moveable in a plane substantially normal to base surface **20.** Bevel gear **320** is secured to spray mechanism **80** in order to now provide rotation of mechanism **80** in two planes.

Hot water, or other cleaning compositions at high temperature levels or under high pressure are introduced into spray mechanism **80** through fluid composition pipe **342.** Fluid composition pipe **342** is connected to hose reel **344** which is mounted to base frame **90** as is shown. High pressure hose **346** is wrapped on reel **344** and extends to a remote area where the high temperature, high pressure or other cleaning composition is being pumped to spray mechanism **80.** Hose reel **344** allows movement of vehicle **10** while maintaining hose **346** in an area which will preclude vehicle interruption if hose **346** were allowed to simply be played out on floor **20.** Additionally reel **344** may be rotatively operated in conjunction with drive mechanism **150** in order to wrap or unwrap hose **344** dependent on the motion direction of vehicle **10.**

Cleaning fluid may be contained within container or tank **340** mounted to base frame **90** as is shown, or may be brought in from external sources. As is shown, fluid may pass through fluid hose **350** into swivel joint **360** which is rotatively mounted to an upper end of tube member **280.** Similarly, detergent or other material contained within tank **340** may be incorporated directly into fluid transport conduit **330** or fluid pipe **342** at another point, not important to the invention. In other cases, container **340** may be removed from the main body of vehicle **10** to allow mixing with incoming fluid at a site remote from the enclosing chamber. In this manner, spray mechanism **80** may rotate without causing an entanglement of mechanism **80** within the fluid hose **350.** Swivel joint **360,** is well known in the art and not part of the inventive concept as herein described. Fluid passing through swivel joint **360** is forced through fluid transport hose **370** and into fluid transport conduit **330** as is shown clearly in FIG. **1.** Connection between fluid transport hose **370** and fluid transport conduit **330** may be provided through a second swivel joint **380** to allow independent rotation of transport conduit **330** with respect to hose **370.** Therefore, rotation of bevel gear **310** in a plane substantially parallel to base surface **20** causes a rotation of meshed second bevel gear **320** in a plane substantially normal to the rotation plane of tube member **280.** Since gear **320** is rigidly secured to transport conduit **330,** it is seen that conduit **330** is also rotated around an axis coincidence with the axis of rotation of bevel gear **320.**

Fluid passing through fluid pipe or conduit **330** is forced to ejection through a plurality of spray heads **390** as is shown. The plurality of spray heads **390** in combination with the fluid pipe **330** therefore form the basic fluid ejection mechanism. Spray heads **390** form an angle approximating 15° to a plane perpendicular to the axis of pipe or conduit **330.** Spray heads **390** may be tubular members as is shown, or may be tubular conduits containing nozzles to aid in the high pressure dispersement of liquid passing through the entire system. In this manner, it is seen that spray heads **390** rotate in essentially two planes; one plane having an axial normal to base surface **20** and a second plane which is parallel to base surface **20.** This combined rotation, in conjunction with high pressure fluid being passed through vehicle **10** provides a cleansing action to base surface **20,** opposing transverse vertical walls **40, 50** and a ceiling section of any enclosing chamber.

Guide or alignment mechanisms **400** are provided on opposing transverse sides of base frame **90** as is shown clearly in FIGS. **2** and **3.** Mechanisms **400** align vehicle **10** in transverse direction **70** with respect to opposing transverse boundary walls **40** and **50.** Mechanisms **400** essentially include a pair of four bar linkage mechanisms mounted to base frame **90** with the entire mechanism **400** being rotatable about an axis coincident with longitudinal direction **60.** Each of mechanisms **400** in-

cludes a guide frame **410** comprising a series of welded tubular or rod members which are rotatably mounted to base frame **90** through rotatable bearings **420** as is shown in FIG. **2.** In this manner, guide mechanisms **400** may be rotated about an axis coincident to longitudinal direction **60** as is shown in the phantom line drawing of FIG. **3.** The ability of mechanism **400** to be rotated in the manner described, provides the ability of guide mechanism **400** to be placed adjacent to vehicle **10,** thereby decreasing the overall transverse dimension of assembly **10** when not in use. This ability further permits vehicle **10** to be placed within a confining chamber such as a truck body prior to operation and to then be rotated to mechanisms **400** extended transverse position for guidance of vehicle **10** in longitudinal direction **60.**

Base link member **440** as is seen in FIG. **2** is secured to guide frame **410** and includes a through passage sufficient to allow insertion of a pair of link rods **430** moveable in longitudinal direction **60.** Opposing link rods **430** may be moved within the through passage of base link member **440** independent of each other. Side linkages of **450** are pivoted with respect to link rods **430** at the pivot points of **470.** Similarly, side linkages **450** are mated to outermost link **460** at pivot connections **480.** A pair of freely rotatable rollers **490** are attached to each of guide mechanisms **400** at pivot connection points **480** as is shown. Springs **500** pass respectively between pivots **470** and **480** to maintain the entire four bar linkage type mechanism in compression loading. In the manner described, it can now be seen that guide mechanisms **400** may be elongated in longitudinal direction **60** by movement of link rods **430** passing through base link member **440.** Similarly, linkage mechanism **400** may be transversely displaced by movement of link rods **430** to any preset displacement. Rollers **490** contact opposing transverse vertical walls **40, 50** and being freely rotatable, merely guide vehicle **10** during a longitudinal displacement.

Automatic actuation of vehicle **10** when approaching a forward boundary wall **30** may be accomplished through a number of techniques well known in the art. Actuation control mechanism **510** may include a longitudinally extending rod **520** which is moveably mounted to base frame **90** through a forward section thereof. As is seen in FIG. **2** extending rod **520** extends beyond the forward section of vehicle **10** in order that rod **520** would contact or sense wall **30** prior to the main body of assembly **10.** Cam element **540** is attached to a rear portion of rod **520** and, as seen, movement of rod **520** through contact with wall **30** causes movement and actuation of contact switch **530.** Actuation of contact switch **530** then causes a reversal of drive mechanism **150** through incorporation of circuitry well known in the art and not part of the inventive concept as herein described. Reversal of drive mechanism **150** then causes a displacement of assembly **10** in a rearward direction. Where a back wall exists a similar mechanism such as the actuation control mechanism **510** may be incorporated into the rear section of assembly **10.** Where there is an open area such as the open end of a truck body, a similar control mechanism may be utilized wherein a sensing rod **550** passing contiguous to base surface **20** senses that there is no longer floor **20** contact and moves to provide actuation of another contact switch to once again reverse motor mechanism **150,** thereby driving the vehicle **10** in a reversable forward direction.

In order to provide a complete cleansing action of base plane or floor **20,** vehicle **10** is equipped with forward brush **560** and rear brush **570** mounted on transverse bars **590** passing in transverse direction **70** to base frame **90.** Additionally, transverse bars **590** contain through openings with spray heads **580** attached in order to permit a spraying action on floor **20** during a predetermined portion of the reciprocal displacement of vehicle **10.** Bars **590** include through openings connected to either containers **340** or to some external source of high pressure liquid or steam not important to the inventive concept. Additionally, forward and rear brushes **560** and **570** respectively may be raised or lowered to base surface **20** during predetermined portions of the cycle through circuitry well known in the art and not part of the invention as herein detailed. In the manner described, the vehicle or assembly **10** provides the cleansing action for all internal portions of a chamber through automatic or manual manipulation.

In typical operation, an operator manually wheels or otherwise transports cleaning vehicle **10** to the back of a truck body to be cleaned. Guide mechanisms **400** are extended, as shown in FIG. **3,** until rollers **490** are contiguous with opposing walls **40** and **50.** Extension of mechanisms **400** in this manner serve to keep vehicle **10** centered during the longitudinal translation of the operating phase. the operator may then select the number of wash and rinse cycles needed for a particular operation (not part of the invention). The start button for drive mechanism **150** is actuated and vehicle **10** begins a forward translation in longitudinal direction **60.**

As movement of vehicle **10** proceeds in forward longitudinal direction **60,** spinning head or spray mechanism **80** applies high pressure, hot soapy water, detergent, or some like cleaning composition to the internal surfaces of the partially enclosed container. During this cycle, sprayheads or conduits **390** are spinning or rotating about an axis substantially normal to the vertical extension of spray tube member **280.** Additionally, the entire spray mechanism **80** is rotating about the vertical axis of tube member **280.**

The total cleaning cycles (at the option of the operator), may be several high pressure wash and rinse cycles and once set may be completed in a time approximating ten minutes. Sources of hot water and power may be supplied from a remote area of the enclosing chamber while cleaning and sanitizing chemicals may be contained on the main body of vehicle **10,** as has been described.

A number of modifications and variations of the present invention as herein before set forth may be made without departing from the spirit and skill thereof, and therefore only such conditions should be imposed as are indicated by the appended claims.

What is claimed is:

1. A cleaning vehicle adapted to translate in a longitudinal direction contiguous with a base surface comprising:

a. a base frame having a plurality of wheel members for translating said cleaning vehicle;

b. drive means mounted to said base frame and operatively connected to said wheel members;

c. spray means for ejecting liquid to a surrounding environment of said vehicle, said spray means

being mounted to said base frame and rotatively moveable in at least two planes of motion with respect thereto; and,

d. guide means mounted on said base frame for aligning said vehicle transverse said longitudinal direction with respect to opposing transverse boundary walls external said vehicle.

2. The cleaning vehicle as recited in claim **1** including means for rotating said spray means in a plane substantially parallel said base surface defining a base plane.

3. The cleaning vehicle as recited in claim **2** wherein said means for rotating said spray means includes a tube member mounted to and rotatable with respect to said base frame, said tube member extending substantially vertical to said base frame and defining a vertically directed through passage, said tube member being secured to said spray means for providing concurrent rotation of said tube member and said spray means.

4. The cleaning vehicle as recited in claim **3** wherein said tube member is rigidly secured to a pulley member passing contiguous on external boundary wall of said tube member, said pulley member passing in a plane substantially parallel said base surface and operatively connected to said drive means.

5. The cleaning vehicle as recited in claim **3** including means for rotating said spray means in a plane substantially normal said base surface.

6. The cleaning vehicle as recited in claim **5** wherein said means for rotating said spray means in a plane substantially normal said base surface includes:

a. a first bevel gear within said tube member, said first bevel gear being secured to said base surface; and,

b. a second bevel gear meshed to said first bevel gear and rotationally moveable in a plane substantially normal said base surface, said second bevel gear being rigidly secured to said spray means.

7. The cleaning vehicle as recited in claim **6** wherein said first bevel gear is fastened to a vertically extending rod passing internal said through passage of said tube member and fixedly secured to said base frame.

8. The cleaning vehicle as recited in claim **7** wherein said spray means includes:

a. means for forcing said liquid external said vehicle at a predetermined angle with respect to said base surface; and,

b. means for transporting said fluid to said means for forcing said liquid external said vehicle, said transporting means rotatively meveable with respect to said tube member.

9. The cleaning vehicle as recited in claim **8** wherein said fluid transportation means includes a swivel joint element secured to an upper surface of said tube member, said swivel joint element connected on opposing ends thereof to said fluid forcing means and a liquid supply external said enclosed chamber.

10. The cleaning vehicle as recited in claim **9** wherein said means for forcing said liquid external said vehicle includes:

a. a pipe member secured to said swivel joint on a first end for transporting said liquid; and,

b. a plurality of sprayheads connected to said pipe on a second end thereof.

11. The cleaning vehicle as recited in claim **10** wherein said sprayheads include tubular extensions passing from said pipe member at a predetermined angle with respect to said vertically directed tube member defining a vertical direction.

12. The cleaning vehicle as recited in claim **11** wherein said tubular extensions approximate an angle of 15° with respect to a plane passing normal said pipe member.

13. The cleaning vehicle as recited in claim **1** including liquid container means mounted on said base member for holding said liquid prior to ejection through said spray means.

14. The cleaning vehicle as recited in claim **1** wherein said guide means includes a pair of four bar linkage mechanisms mounted to said base frame on opposing transverse sides thereof, said mechanisms being rotatable about an axis coincident with said longitudinal direction.

15. The cleaning vehicle as recited in claim **14** wherein each of said four bar mechanisms include a pair of rollers pivotally mounted to said mechanisms for contacting said opposing transverse boundary walls, said rollers extending in said transverse direction beyond that of any individual component of said linkage mechanisms.

16. The cleaning vehicle as recited in claim **15** wherein each of said mechanisms includes base link means for longitudinally varying the length of each of said mechanisms with respect to said base frame.

17. The cleaning vehicle as recited in claim **16** wherein said base link means inclues:

a. a base link member secured to said base frame and having a longitudinally extended through passage of predetermined diameter, and;

b. a pair of longitudinally extended link rods insertable within said base link member through passage on opposing longitudinally directed ends thereof.

18. The cleaning vehicle as recited in claim **1** including actuation control means mounted on said base frame for reversing said longitudinal translation of said vehicle when a boundary wall is sensed, said actuation control means being operatively connected to said drive means.

19. The cleaning vehicle as recited in claim **18** wherein said actuation control means includes:

a. a longitudinally extending rod moveably mounted on said base frame, said rod extending forward said vehicle for contacting said boundary wall; and,

b. a contact switch actuated by said extending rod when said rod contacts said boundary wall, said contact switch for reversing said drive means for translating said vehicle in a predetermined direction.

20. A truck body cleaning assembly adapted to wash the interior surfaces of a truck body, comprising:

a. a base frame having a plurality of wheels for displacing said assembly in a substantially longitudinal direction contiguous to a floor surface of said truck body;

b. motor means securely mounted to said base frame and operatively connected to at least one of said wheels;

c. means for ejecting fluid to said interior surfaces of said truck body, said ejection fluid means being operatively connected to said motor means and rotatively mounted to said base frame; and,

d. contact sensing means mounted on said assembly for determining boundary surfaces of said truck

body, said contact sensing means for reversing said displacemnt direction of said cleaning assembly.

21. The truck body cleaning assembly as recited in claim **20** including means for rotating said fluid ejection means in a plane substantially parallel said floor surface of said truck body.

22. The truck body cleaning assembly as recited in claim **21** wherein said means for rotating said fluid ejection means includes a tube member passing substantially vertical said floor surface and rotatively mounted to said base frame, said tube member having a predetermined internal diameter defining a through passage.

23. The truck body cleaning assembly as recited in claim **22** wherein said rotation means for said fluid ejection means includes a pulley member securely fastened to an outer wall of said tube member and rotational in a plane substantially parallel said floor surface, said pulley member being operatively connected to said motor means through an endless belt.

24. The truck body cleaning assembly as recited in claim **22** including means for rotating said fluid ejection means about an axis passing substantially parallel said floor surface of said truck body.

25. The truck body cleaning assembly as recited in claim **24** wherein said means for rotating said fluid ejection means about said axis includes gear actuation means connected to said tube member within said through passage of said tube member.

26. The truck body cleaning assembly as recited in claim **25** wherein said gear actuation means includes a pair of meshed bevel gears having axes of rotation substantially normal each other, said pair of bevel gears defining a first bevel gear secured to said base frame and a second bevel gear for rotating about an axis substantially normal to the axis of said first bevel gear.

27. The truck cleaning assembly as recited in claim **26** whrein said second bevel gear is secured to said means for ejecting fluid, said second bevel gear and said means for ejecting fluid having coincident axis of rotation for rotating said fluid injection means about said axis passing substantially parallel said floor surface of said truck body.

28. The truck cleaning assembly as recited in claim **20** including means for aligning said assembly between opposing transversely opposed sidewalls of said truck body during displacement of said assembly in said longitudinal direction.

* * * * *