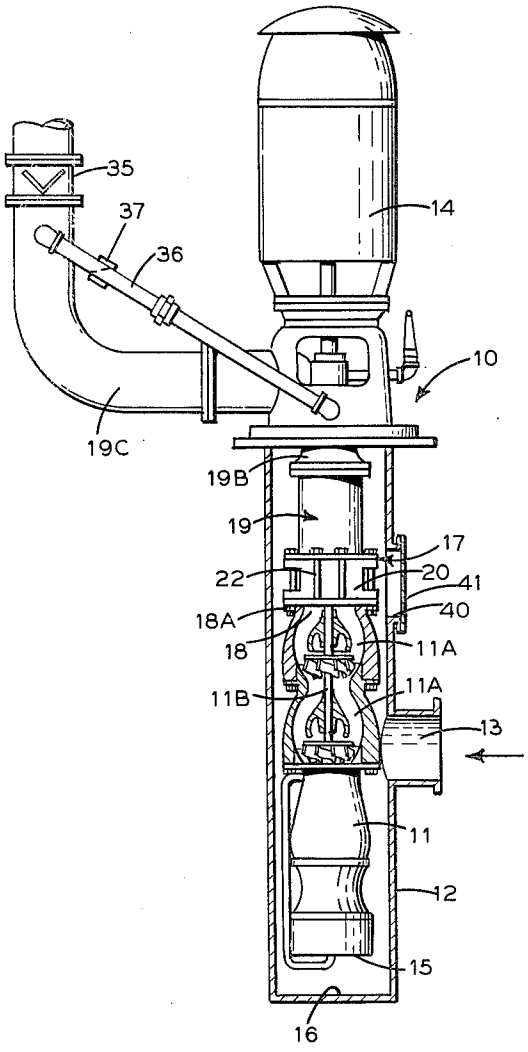
Oct. 12, 1965 D. J. KEEHAN 3,211,102

SELF PRIMING PUMP AND AUTOMATIC PRIMER VALVE THEREFOR

Filed July 18, 1963 2 Sheets-Sheet 1

FIG. 1



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Filed July 18, 1963 2 Sheets-Sheet 2

FIG. 2

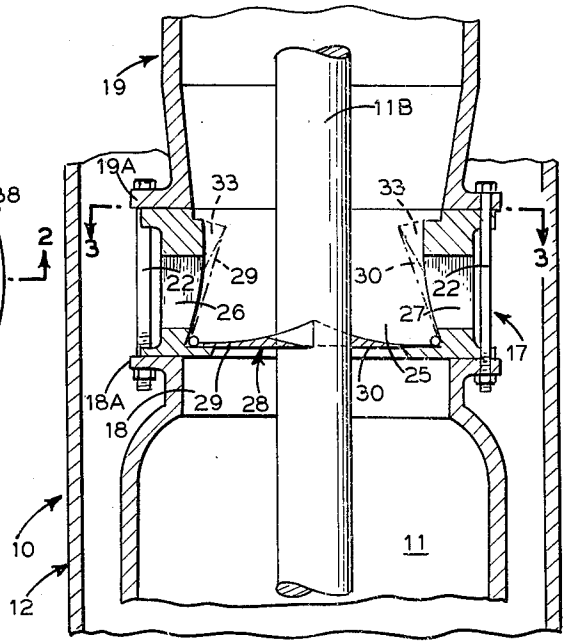


FIG. 3

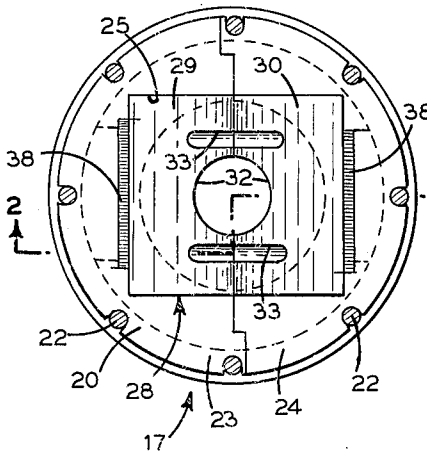
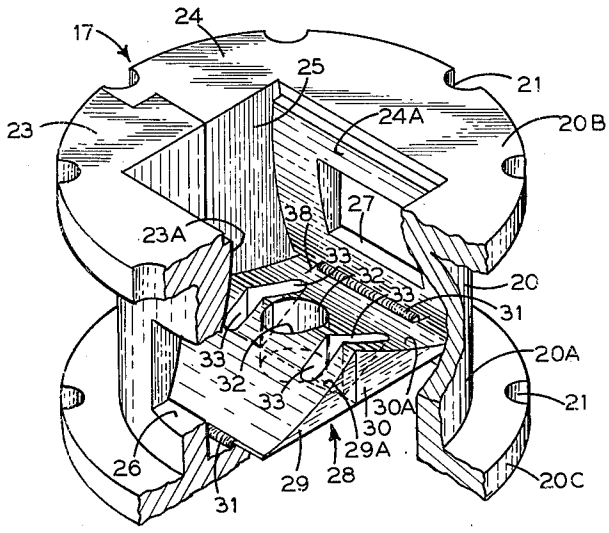


FIG. 4



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3,211,102

SELF PRIMING PUMP AND AUTOMATIC PRIMER VALVE THEREFOR

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Filed July 18, 1963, Ser. No. 296,049
10 Claims. (Cl. 103—113)

This invention relates in general to a self priming pumping system and more specifically to an automatic self priming pump and improved primer valve therefor which is particularly adapted for unloading a liquid from a vessel or a barge where vapors and/or air prove troublesome in handling the pumpage.

Heretofore, in unloading a liquid cargo from a tanker, for example, it was customary to use two separate pumping systems, namely a main cargo unloading system consisting of a horizontal centrifugal pump connected to a relatively large size main header and valves with smaller branch line and valves protruding through the bulk head to the suction well, and a stripping system comprising of an up and down positive displacement position type pump connected to a nominal size pipe which runs through the ship and into each tank compartment and having a suction valve and a suction well. In unloading a ship with such two pump unloading system, the main cargo unloading pump is first operated at a given rate at 100% of its capacity until a liquid level in the tank is reached which is approximately 2 or 3 feet above the base line of the ship. At about this liquid level the product being handled may develop too high a vapor pressure to overcome the frictional losses in the suction system to allow enough liquid to get to the pump to keep it operating properly. When this occurs, the main cargo pump must be shut off and the stripping pump turned on to create the vacuum to overcome the suction losses and to pull the product to the pump. The stripping pump operates at about 25% capacity of the main cargo pump, thus necessitating the vessel being tied up for an extended period of time in order to strip last remnants of the cargo liquid out of the vessel.

To overcome the use of the relative slow and complex dual pumping systems, efforts have been made to provide for a single pump, self priming, pumping system which can automatically pump and strip the last remnants of the cargo liquid out of a tanker hole. U.S. Patent No. 2,902,940, is evidence of a known self priming pumping system which has heretofore been utilized to effect both the pumping of the main cargo and automatically stripping of the remnants of such liquid cargo. The known automatic self priming pump system of the type to which this invention relates as evidenced by Patent 2,902,940 utilized a self priming valve construction, interposed between the uppermost pumping stage and the discharge conduit, as a means to effect automatic priming of the pump in the event that gas or air has entered the pump to break the suction. The self priming valve so employed comprised generally a valve housing with a sliding valve member responsive to the flow of the pumpage through the valve housing when the pump was operating, and responsive to gravity upon the cessation of the pumpage therethrough. While the pumping system employing a sliding valve member of the type evidenced by the U.S. Patent 2,902,940 operate satisfactorily, it has been nevertheless noted that the operation and efficiency of such system is seriously adversely effected when used to pump a relatively dirty liquid, i.e. a liquid which may contain a large percentage of impurities, as for example, dirt, sand or grit. It has been noted that when the pump of the type disclosed in said patent is utilized to pump a dirty

liquid, the impurities in the liquid being pumped frequently will cause the sliding valve member thereof to bind or stick. When this occurred, the priming action of the pump is rendered ineffective. Therefore, each time the sliding member started to bind, the pumping operation would have to be stopped and the pump disassembled and cleaned so that its operation would again be rendered effective. Consequently, each dissambly of such pump to effect a cleaning thereof resulted in a considerable loss of time. Thus ships, barges and vessels carrying such liquid cargos have to be held up for an extended period of time. Holding or delaying a ship for such reason generally results in a considerable expense.

It has also been noted that the efficiency of the patented pump construction is adversely affected due to the ports of the primer valve extending transversely of the main passageway of the valve construction. The loss in efficiency is developed because the transversely extending port passage interrupted the flow of pumpage through the primer valve and thus created turbulance in the liquid flow therethrough. It is estimated that the turbulance in the liquid flow created by the transversely extending primer ports reduced the overall efficiency of the pump approximately 10% to 20%.

Therefore, it is an object of this invention to overcome the inherent disadvantages of the known self priming pumpage by providing an improved self priming pumping system constructed and arranged so as to be able to handle both clean and dirty liquids with equal facility.

It is also another object of this invention to provide an improved automatic primer valve constructed and arranged so as to minimize any turbulance in the liquid flow therethrough when the pump is operating and thereby enhance the overall efficiency of the pump.

It is another object of this invention to provide an improved primer valve construction which can be easily maintained, and which can be readily assembled and disassembled with a maximum of ease and a minimum of effort.

It is another object of this invention to provide an improved automatic primer valve with improved valving members which are provided with means for enhancing the valving of said valve means during a priming operation of the pump.

It is another object of this invention to provide an improved self priming pump system which is relatively simple in construction, inexpensive to facilitate, and positive in operation.

Still another object is to provide an improved self priming pump constructed and arranged so as to have a minimum amount of wear.

The foregoing objects and other features and advantages of this invention are attained by disposing an improved primer valve construction between the uppermost stage of a centrifugal suction type pump and the discharge conduit thereof. In accordance with this invention the improved primer type valve construction comprises essentially of a housing which is preferably defined by a pair of similarly constructed complementary sections, which in the assembled position thereof will define a central passageway through which the pumpage is directed when the pump is operating. The internal walls of the respective housing sections are formed to define a passageway which will provide for a substantially smooth uninterrupted flow of liquid therethrough. In the opposed wall portions of the housing there is provided a port which connect the interior of the passageway to the exterior of the housing. Swing valve means are hingedly connected to the interior of the respective housing sections to define a valving member which will alternately valve the passageway and the respective ports

between opened and closed positions. The arrangement of the swinging valve means is such that the flow of fluid being pumped through the passageway of the valve housing serves to open the passageway by lifting the same and thus positioning the same to close the respective ports. Means in the form of channelways are formed in the free end of the respective swinging valve means to serve as vacuum breakers to facilitate movement of the swing valves to close the passageway so that automatic priming of the pump can occur in the event that the flow of liquid being pumped is ceased for any reason. The arrangement is such that upon cessation of the flow of liquid through the primer valve, the swinging valve will automatically swing from the port closed position to the passage closing position. The return of the swinging valve members to a passage closed position is rendered positive by means of a spring which forms a portion of the swing valve hinge connection, and the return of the pumpage initially directed through the vacuum breaker channelways formed in the upper end of the swinging valves serve to further enhance the closing of the swinging valve during the priming operation. Thus the return of the pumpage and the discharge thereof through the port openings of the valve housing, serves to reprime the pump. Means are also provided to evacuate the vapor or air to the discharge column during a priming operation. Thus upon the discharge of the pumpage after the priming operation there is again created a vacuum which will draw more of the pumpage from the cargo supply into the pump well. The arrangement is such that the priming cycle will automatically repeat itself as many times as is necessary to remove all the aid and/or vapor which is interrupting the continual removal of the liquid from the given cargo tank.

A feature of this invention resides in a self priming pump system housing and improved primer valve construction which includes a sectional valve housing to facilitate the assembly and disassembly of the unit and which section can be made by the same mold.

Another feature of this invention resides in a self primer valve with novel swinging valve construction which enables a pump embodying the same to be utilized for pumping either a clean or dirty liquid with equal facility.

Still another feature of this invention resides in the provision of a valve housing constructed so as to define a smooth, relatively interrupted main flow passageway so as to minimize any turbulent flow of liquid therethrough and thereby permit maximum efficiency of the pump utilizing the same.

Other features and advantages will be more readily apparent when considered in view of the drawings and description in which,

FIGURE 1 is a front elevation view having parts shown in section illustrating the self priming pumping system of this invention.

FIGURE 2 is an enlarged detail sectional view illustrating the improved automatic primer valve of this invention to which the valving means thereof are shown in their normal inoperative position by the solid lines and in the operative position by the dot-dash lines,

FIGURE 3 is a plan section view taken along line 3—3 of FIG. 2.

FIGURE 4 is a detail perspective view of the improved automatic primer valve construction of the instant invention with parts thereof broken away and illustrating the details of construction of the swinging valve means.

Referring to the drawings, there is shown in FIG. 1 a self priming pumping system **10** of this invention. It comprises a centrifugal suction pump **11** completely encased in a suction well or bell **12** which is entirely closed except for the suction inlet **13** which is adapted to be connected to a suitable pipe or conduit (not shown) which leads to the liquid cargo to be unloaded or pumped. The pump **11** merely comprises a multiple stage centrifugal pump in which the respective stages **11A** thereof are driven by a common shaft **11B** which extends vertically through the pump and which is powered by a motor **14**. As shown, the inlet end **15** of the pump is disposed adjacent the bottom **16** of the suction well **12**.

In accordance with this invention, an improved automatic primer valve **17** is interposed between the discharge end **18** of the pump and a discharge conduit **19** to which the liquid being pumped is directed. The discharge conduit **19** connects to a source of storage (not shown) for receiving the fluid or liquid being pumped. Accordingly, when the pump **11** is placed in operation, the liquid entering the suction well due to the suction created is successively pumped upwardly from one stage to the next through the respective stage passageways. The improved automatic primer valve **17** thus converts the centrifugal suction type pump **11** into an automatic self priming pump and the pump system formed thereby as shown in FIG. 1 is rendered effective for unloading both main portion a liquid cargo as well as for stripping the last remnants thereof.

The improved automatic primer valve **17** of the instant construction comprises of a valve housing **20** which is defined by a substantially circular body portion **20A** which terminate in laterally extending upper and lower flanges **20B, 20C**. As seen in FIG. 2, the valve housing **20** is interposed between a flange **18A** adjacent the pump outlet **18** and a flange **19A** connected to the lowermost segment of the discharge conduit **19**. A plurality of notches **21** are circumferentially spaced about the outer periphery of the upper and lower flanges **20B, 20C** of the valve housing **20** and they are arranged so as to be disposed in vertical alignment with holes formed in the flanges **18A, 19A** of the pump outlet **18** and the discharging conduit **19** respectively. Thus, it will be noted that the valve housing **20** can be readily inserted between the discharge end **18** of the pump and the inlet to the discharge conduit **19** by merely disposing the flanges **20B, 20C** of the valve housing into abutting engagement with the respective flanges **18A, 19A** of the pump outlet **18** and the discharge conduit **19**. The housing **20** is secured by extending a series of fastening bolts **22** through the aligned apertures and notches **21** of the respective flanges **20B, 20C**.

As seen in FIG. 3, it is preferred that the instant valve housing **20** be formed of a pair of similarly constructed complementary half sections **23, 24**. The respective half sections **23, 24** are made so that they can be readily formed by the same mold and thereby greatly minimize the fabrication cost.

To assemble the respective complementary half sections **23, 24** of the housing, it is merely necessary to place the two sections in end to end relationship and to position the same between the flanges **18A, 19A** of the discharge conduit and the pump outlet. The arrangement is such that the circumferentially extending fastening bolts **22** extending between the respective flanges **18A, 19A** of the discharge conduit and the pump outlet serve to keep the respective housing half sections **23, 24** in close abutting relationship so as to render the same fluid tight. If desired, a suitable gasket means may be interposed between the respective complementary half sections. As shown in FIGS. 3 and 4, the respective half sections **23, 24** of the valve housing **20** when assembled in one place between the pump outlet and the discharge conduit defines a passageway **25** which is free of any obstruction which will create any turbulance in the flow of liquid therethrough. Formed in opposed wall portions **23A, 24A** of the respective housing sections **23, 24** is a port **26, 27** respectively which extends transversely through the wall portion of the housing **20** to connect the passageway **25** in communication the suction well **12**. In the illustrated embodiment, it will be noted that the opposed wall portions **23A, 24A** in which the ports **26, 27** are

formed are curvilinear, and tend to converge in the general direction of fluid flow therethrough.

Pivotally connected to each respective housing sections **23, 24** is a swinging valve means **28**. As best seen in FIGS. 2 and 3, the valve means **28** comprises a pair of flapper valve plates **29, 30**. Each is hingedly connected along one edge thereof by means of a suitable hinge pin **31** to its respective housing section **23, 24** adjacent the lower end thereof. It will be noted that each of the respective flapper valve plates **29, 30** is provided along the opposite edge thereof, and midway between the side ends thereof with a notched out portion **32**, which in the closed postion of the respective flappers **29, 30** defines an opening for accommodating the drive shaft **11** of the respective pump stages. Disposed on either side of the opening **32** provided for the pump shaft **11**, each of the respective flappers is provided with means for defining a channelway **33**, the purpose of which will be hereinafter described.

As shown, each of the respective flappers **29, 30** is formed with a curvilinear upper surface **29A, 30A** which is sloped so as to progressively increase the cross-sectional thickness of the respective flapper valve plates in the direction toward the free end thereof. As shown in FIG. 4, the opposed sidewalls **23A, 24A** of the respective housing sections are formed with a curvilinear wall surface which converges in the direction of flow of the pumpage therethrough. The curvature of the opposed inner sidewalls **23A, 24A** of the respective complementary housing sections is such it will complement the curvature **29A, 30A** of the respective flapper valve plates **29, 30**. Thus, in the embodiment illustrated, it is to be noted that the main passageway **25** defined by the housing **20** is substantially smooth and without interruption. The particular arrangement of the respective swinging valve flappers **29, 30** is such that they will pivot between a horizontal position as shown solid in FIG. 2, wherein they form a closure for the main passageway and a substantially upright position as indicated by the dot-dash lines of FIG. 2 wherein they serve as a closure for the respective port openings **26, 27** which extend through the respective sidewalls of the valve housing. The arrangement is such, as shown in FIG. 2, that with the flappers **29, 30** in the raised position thereof, the channelways **33** formed in the free end thereof are disposed in communication with each of the respecive port openings **26, 27**. The respective disposition of the channelways **30** with respect to the port openings thus functions as a vacuum breaker when automatic priming of the pump is affected as will be hereinafter described.

Thus as seen in FIG. 2, with the flapper valve plates **29, 30** in their horizontal position as shown in FIG. 2, the main passageway **25** of the valve housing is closed and the ports **26, 27** extending transversely to the exterior thereof are open. When the respective flapper swing valve members **29, 30** are in their upper position as shown by the dot-dash lines of FIG. 2, the main passageway **25** of the valve housing is opened to place the upper outlet end of the upper pump stage in open communication with the inlet end of the discharge conduit, and the respective ports **26, 27** extending transversely to the exterior of the valve housing are closed except for the communication of the breaker channelways **33** therewith.

As seen in FIG. 1, the upper end of the discharge segment **19** connects to a pair of elbow segments **19B, 19C** and thus serves as an accumulating chamber or a reservoir for the priming pumpage. Located in the end of the discharge column so formed is check valve **35** to prohibit the back flow of pumpage. Also an air or vapor evacuating pipe **36** is provided together with a check valve **37** between the upper end of the discharge segment and the elbow segment immediately below the liquid check valve. Thus, as will be hereinafter described, the air evacuating pipe **36** serves as a means for venting the displaced air or vapor in the suction well **12** when the same is primed.

With the structure of the pump thus described, the operation of the pumping system is as follows:

Before starting the pump, the suction well or bell **12** is filled with a sufficient amount of liquid to submerge the pump inlet **15**. In accordance with this invention, it is not necessary to fill the suction manifold or piping system, or to vent any part of the suction system. With the inlet end of the pump submerged in liquid in the suction bell, the pump is started. The pumpage initially disposed in the suction well **12** is delivered to the discharge column **19** and piping leading to the point of liquid storage, and the liquid in passing through the outlet of the discharge pipe opens the main check valve **35**. The pumping of the liquid initially placed in the pump well **12** thus creates a vacuum which causes the vapor and air to be drawn into the pump well and new pumpage flows into the system. The pumpage, as it flows through the successive pump stages **11A** and into the valve housing **20** causes the flapper valves **29, 30** to pivot upwardly to a position shown by the dotted lines in FIG. 2. Thus with the pump operating, liquid will be pumped through the pumping system at full capacity as long as air is not introduced into the suction line.

In the event that a slug of air is introduced into the suction line, as for example, when the level of the liquid in the barge or vessel being unloaded falls below a predetermined low level, the suction to the pump **11** is broken and the flow of liquid thereto is stopped. When this occurs, the automatic self priming feature of the pump **11** is placed in motion. That is, when the flow of liquid through the valve housing **20** is stopped because of air being introduced into the suction line, the swing valve **28** will automatically swing close, i.e. to their horizontal position, thereby causing the transversely extending port openings **26, 27** in the valve housing **20** to open. However, it is to be noted that the opening of the ports **26, 27** by the dropping of the flappers **29, 30** is enhanced by the column of liquid disposed in the discharge conduit **19**. That is upon the cessation of liquid flow through the primer valve, the return of the liquid standing in the discharge conduit **19** below the check valve **35** will back flow to the valve housing and a portion thereof will initially flow through the channelways **33** formed in the end of the respective flappers, and thus function as a vacuum breaker to prevent any hang up of the flapper valve plates **29, 30** during the priming operation of the pump. In this manner, positive actuation of the respective flapper valve **28** is achieved. Also, a spring **38** forming part of the hinge connection may be utilized to form to exert a positive force for biasing the flappers **29, 30** to their horizontal position during a priming operation. Consequently, a positive acting flapper valve is effected by the instant construction. Thus, with the flapper valve **28** closed or disposed in the horizontal position as shown in FIG. 2, the column of pumpage disposed in the discharge conduit **19** is then directed out through the transversely disposed port openings **26, 27** to prime the suction well. Thus the pumpage flowing backward through the primer valve **17** is replaced by an equal amount of air or vapor which is transferred from the pump well **12** through the evacuating line **36** and into the upper end of the discharge column **19**. The returned pumpage reprimes the pump **11** when the liquid from the discharge column submerges the inlet **15** of the pump element. Upon completion of the priming operation, the flow of pumpage through the pump is re-established and forces the vapor and air in the discharge column together with the pumpage to the point of storage. The discharge pumpage again creates a vacuum sufficient to draw more pumpage into the pump well. Accordingly the operation is such that the priming cycle will repeat itself automatically as many times as necessary in order to remove all of the air and vapor to the stores storage. Through the valve **17** continual removal of the vapor and air from

the suction manifold, a vacuum is created which will draw pumpage from the vessel or barge compartments into the pumper well **12**. Then with normal pumpage flow, the swing valves again lift and close the port openings **26, 27**. The pump will then discharge its rated capacity against the required head, and will continue as long as there is an uninterrupted flow of pumpage therethrough.

After the normal unloading procedure, that is the major portion of the cargo has been emptied, it is important that the small amount of pumpage left in each of the cargo compartments be removed so that ultimately all of the liquid cargo may be evacuated from its compartment. Generally this operation is referred to as stripping, and it is usually accompanied by volumes of air or vapor occasioned by the vortex or swells at the suction inlet which repeatedly interrupts flow. When this occurs, the swing valves **29, 30** again operate to automatically reprime the pump and thereby transfer the air and vapors from the suction system to the discharge column. Thus, the priming and repriming cycles as hereinbefore described will repeat automatically as many times as necessary to remove all of the air and vapor from the suction system and the pump well. This action permits new pumpage to flow from the cargo tanks into the pump well. The operation thus repeats automatically until the completion of the stripping operation. Upon the completion of the stripping operation the pump should be stopped as the valve will continue to recycle continuously in attempting to regain suction. However, it is to be noted that the recycling of the pump will not harm the same. This is because that there is always a certain amount of liquid for reserve in the discharge conduit which will serve to lubricate the pump during the recycling operation.

From the foregoing, it will be readily apparent that the improved automatic primer valve **17** is constructed and arranged so as to provide automatic self priming of the pump in the event the flow of pumpage therethrough is interrupted for any reason. Also it is to be noted that the specific construction and arrangement of the primer valve **17** is such that the passageway **25** defined thereby is not hampered by transversely extending obstacles which will induce turbulance in the flow of pumpage therethrough, and thereby will not result in a loss of efficiency as have been noted with prior constructions. The novel swing type valve **28** is further constructed and arranged so as to enhance the operation of the pump in handling relatively dirty liquids as well as clean liquids. Further the specific construction thereof minimizes the amount of maintenance and care otherwise required. Also, the instant construction is arranged so as to reduce an initial cost of fabrication inasmuch as the respective valve housing **20** can be formed in sections **23, 24** which are similar in construction and therefore can be formed by a single mold. The instant construction further enhances maintenance in that the valve housing **20** may be disassembled in a minimum of time. This is afforded by the fact that it is not necessary to remove all of the bolts **22** which secures the primer valve **17** in position between the pump outlet and the inlet to the discharge conduit. As is viewed in FIG. 3, it will be noted that by removal of only the bolts **22** along one segmental part of the pump will be sufficient to effect disassembly of the valve housing. Therefore, with the applicant's construction, it is never necessary, except for the complete replacement of the valve housing, to remove all of the bolts **22** which secure the same in position. Therefore, the amount of lost time which is otherwise entailed to disassemble the same for any reason can be reduced 50%. To provide ease of access to the valve housing, an access opening **40** is disposed in the suction well **12** opposite the valve **17** and the opening **40** is sealed by a suitable closure **41**.

While the instant invention has been disclosed and illustrated with reference to a particular embodiment thereof, it is to be appreciated that variations and modifications thereof may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. An automatic primer valve for use on a liquid pump comprising,
- (a) a valve housing adapted to be mounted to the outlet of a pump,
- (b) said housing being formed of complementary sections defining discharge passageway in communication with the pump outlet,
- (c) means defining a port extending through a wall portion of each section,
- (d) said port being in communication with said discharge passageway of said housing,
- (e) and valving means pivotally mounted to each section within the passageway defined thereby for valving said ports substantially closed during the normal pumping operation of the pump and for valving said passageway close and opening said ports upon ceasation of a normal pumping operation so as to effect a priming of the pump.

2. The invention as defined in claim **1** wherein the walls of said sections define an uninterrupted passageway therethrough.

3. For use in a liquid pump having a drive shaft and a centrifugal pumping stage connected thereto, said drive shaft extending through the outlet of said pump, the improvement of,
- (a) an automatic primer valve,
- (b) said valve including a valve housing connected to said pump outlet,
- (c) said valve housing defining a discharge passageway which is in communication with the outlet of said pump,
- (d) means defining a port opening extending transversely through the wall of said housing, said port opening being in communication with said discharge passageway
- (e) and a swinging valve means pivotally mounted in said housing, whereby said valve means is actuated to open said passageway to the pump outlet and close said port opening in response to the flow of liquid being pumped therethrough,
- (f) and means for positively effecting return of said valve means upon interruption of the flow of liquid therethrough to close said passageway and to open said port opening, said valving means including,
- (g) a pair of flappers, each being hingedly connected along one edge thereof to the valve housing to swing to passage open position during the flow of liquid therethrough.

4. The invention as defined in claim **3** wherein,
- (a) vacuum breaker means are formed in the free ends of said flappers.

5. The invention as defined in claim **4** wherein,
- (a) said vacuum breaker means includes a channel way formed in the end of said flappers which is adapted to communicate with said port when said flapper valve has said port closed.

6. An automatic primer valve for use in a liquid pump having a pump outlet comprising,
- (a) a valve housing,
- (b) means adapted for securing said housing to the outlet of the pump,
- (c) said housing defining a passageway to provide for the smooth flow of liquid therethrough,
- (d) said housing having opposed curvilinear wall portions with a port opening therein,
- (e) a flapper valve means,
- (f) means for hingedly connecting the flapper means to the valve housing whereby said valve means pivot

to close the passageway of said housing and open the port openings or to open said passageway and close port openings,

(g) said flapper means having a curvilinear surface adapted to substantially complement the curvilinear wall portion of said housing,

(h) and means defining a channel way in the end of said flapper means opposite the hinged end thereof and,

(i) said channel way being angled so as to be disposed in communication with the port openings when said flapper means valve said port openings close.

7. An automatic primer valve for use in a liquid pump having a pump outlet comprising,

(a) a valve housing, said housing being formed of relatively separable complementary sections,

(b) means for securing said complementary sections of said housing to the outlet of the pump,

(c) said housing defining a passageway which forms an extension of the pump outlet,

(d) said sections of said housing each having a curvilinear opposed wall portion which converge in the direction of liquid flow therethrough,

(e) means defining a port opening in each of said opposed curvilinear wall portions of said housing,

(f) valve including a pair of flappers,

(g) means for hingedly connecting one end of said flappers to a respective housing section whereby said respective flappers are arranged to pivot for closing the passageway of said housing and opening the ports opening, or opening said passageway and closing the port openings,

(h) each of said flapper having a curvilinear surface adapted to substantially complement to the curvilinear wall portion of the respective housing section,

(i) and means defining a channel way in the end of each flapper opposite its hinged end,

(j) said channel way being angled so as to be disposed in communication with the respective port opening when said pair of flappers valve said port openings close.

8. A self priming pumping system comprising.

(a) a closed suction well adapted to receive a quantity of priming liquid,

(b) means defining a suction inlet connection to said well, said suction inlet being adapted to connect to a source of liquid to be pumped,

(c) a pump disposed in said well,

(d) said pump having a liquid inlet in communication with said well, and a liquid dicharge opening,

(e) a liquid discharge pipe adapted to connect to a storage area for the liquid to be pumped,

(f) an automatic priming valve disposed between said discharge pipe and the outlet of said pump,

(g) said valve including a housing defining a substantially uninterrupted passageway connecting said pump outlet to said discharge pipe,

(h) said housing having a port formed in opposed wall portions thereof,

(i) valving means for alternately valving said passageway and the respective ports,

(j) said valving means including a pair of flappers,

(k) each of said flappers being respectively hingedly connected along one edge thereof to said housing,

(l) each of said flapper having a channelway formed in the end thereof and,

(m) said channelway communicating with the port valved thereby when said flappers are in the port valving position.

9. A self priming pumping system comprising,

(a) a closed suction well adapted to receive a quantity of priming liquid,

(b) means defining a suction inlet to said well, said suction inlet being adapted to connect to a source of liquid to be pumped,

(c) a pump disposed in said well,

(d) said pump having a liquid inlet in communication with said well, and a liquid discharge opening,

(e) a liquid discharge pipe adapted to connect to a storage area for the liquid to be pumped,

(f) an automatic priming valve disposed between said discharge pipe and the outlet of said pump,

(g) said valve including a housing defining a substantially uninterrupted passageway connecting said outlet to said discharge pipe,

(h) said housing having opposed curvilinear wall portion converging generally in the direction of liquid flow therethrough,

(i) a port formed in each of said opposed wall portions,

(j) valving means for alternately valving said passageway and said ports,

(k) said valving means including a pair of flappers,

(l) each of said flappers being respectively hingedly connected along one edge thereof of said opposed wall portions,

(m) each of said flappers having a curvilinear surface complementing that of said wall portions whereby the cross-sectional thickness thereof progressively increases from its hinged end,

(n) a channel way formed in the thicker portion of the respective flappers, and,

(o) said channel way being inclined so as to communicate with the port valved thereby when said flappers are in the port valving position.

10. A self priming pumping system comprising,

(a) a closed suction well adapted to receive a quantity of priming liquid,

(b) means defining a suction inlet to said well, said suction inlet being adapted to connect to a source of liquid to be pumped,

(c) a pump disposed in said well,

(d) said pump having a liquid inlet open in communication with said well, and a liquid discharge opening,

(e) a liquid discharge pipe adapted to connect with a storage area for the liquid to be pumped,

(f) a liquid check valve disposed in said discharge pipe,

(g) an automatic priming valve interposed between said discharge pipe and the outlet of said pump,

(h) said valve including a housing,

(i) said housing being defined by a pair of similarly constructed complementary sections fitted together to define a substantially uninterrupted passageway connecting said pump outlet to said discharge pipe,

(j) each of said sections having a wall portion which is curvilinear in cross-section and disposed opposite one another in the assembled position of said housing, said opposed wall portions converging generally in the direction of liquid discharged therethrough,

(k) a port formed in each of said opposed wall portions,

(l) valving means for alternately valving said passageway and said ports,

(m) said valving means including a pair of flappers,

(n) each of said flappers being respectively hingedly connected along one edge thereof to its respective housing section,

(o) each of said flappers having a curvilinear surface whereby the cross-sectional thickness thereof progressively increases from its hinged end to its respective free end,

(p) a channel way formed in the thicker portion of the respective flappers, and,

(q) said channel way being inclined so as to communicate with the port valved thereby when said flappers are in the port valving position.

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