Feb. 18, 1969 H. W. HART 3,428,028

DRINKING CUP FOR FOWLS

Filed Jan. 5, 1967 Sheet 1 of 2

Fig. 1

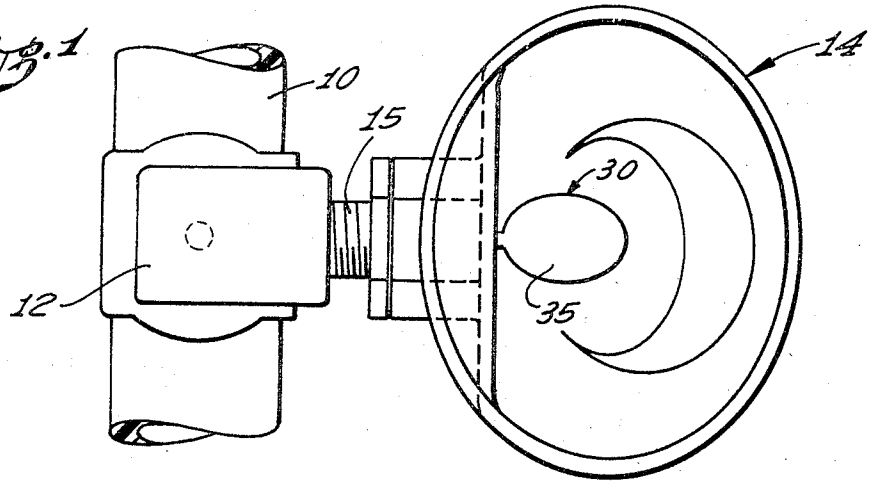


Fig. 2

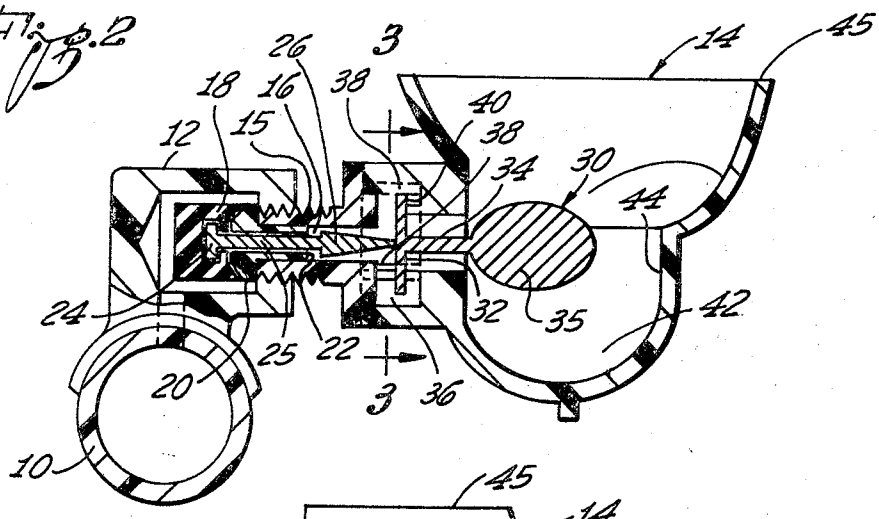
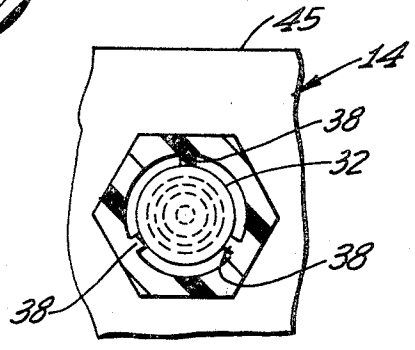


Fig. 3



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Fig. 4

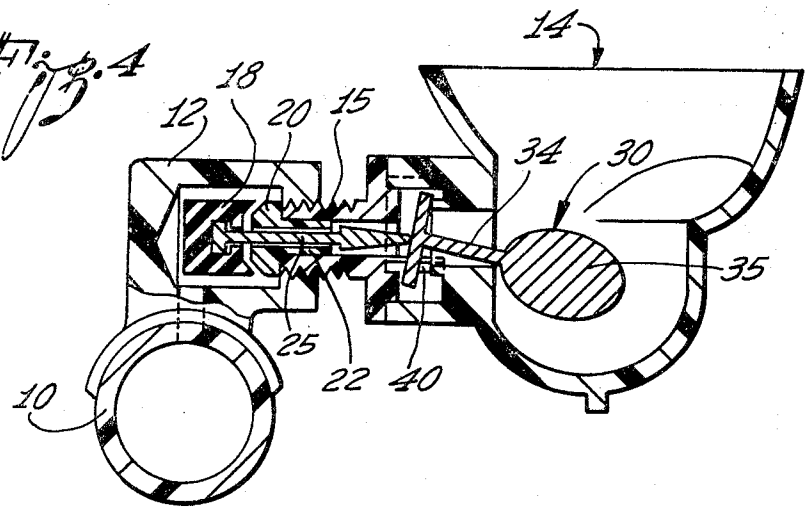


Fig. 5

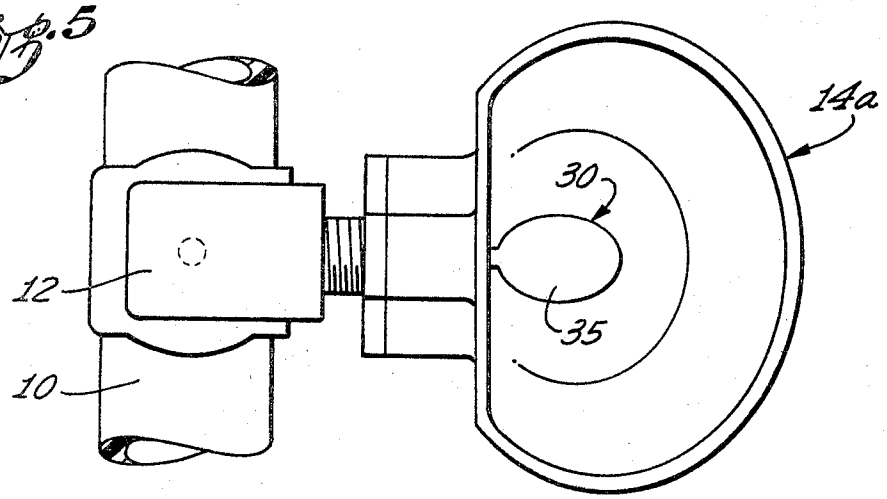
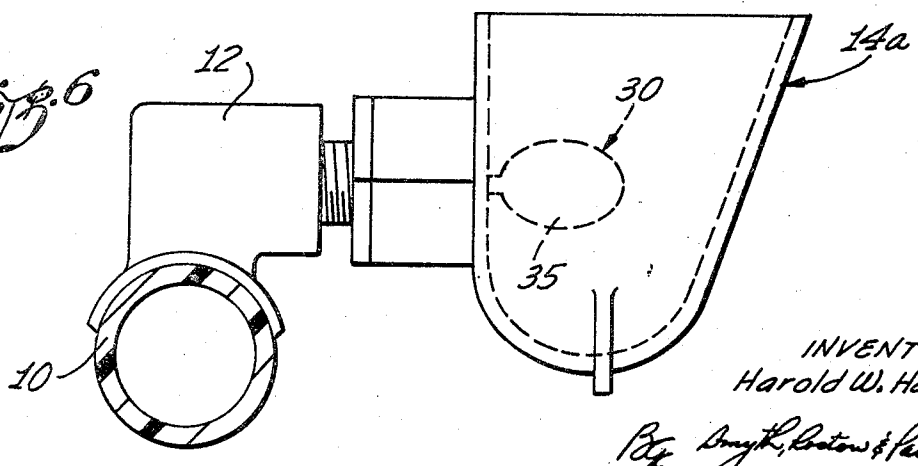


Fig. 6



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3,428,028

DRINKING CUP FOR FOWLS

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Filed Jan. 5, 1967, Ser. No. 607,536
U.S. Cl. 119—75 12 Claims
Int. Cl. A01k 7/02

ABSTRACT OF THE DISCLOSURE

The invention is a drinking cup for fowls wherein the fowls peck a trigger to actuate a valve for supplying water to the cup. The trigger is a buoyant lever that responds to axial force as well as to lateral forces from all radial directions.

Background of the invention

This invention relates to a drinking cup for poultry of the type which is connected to a water supply at a suitable pressure and includes a valve with an operating member inside the cup that may be pecked by the fowls to release the water as required. Typically, the water passage of the cup is formed with a valve seat and a cooperating valve member is normally held in closed position against the seat by the pressure of the water supply. The valve has an operating extension which extends through the valve seat and through the passage towards the drinking cup.

In one such drinking cup that is disclosed in my Patent 2,319,928 and is used primarily for adult birds, the operating extension of the valve member is in the form of a plunger that extends into the cup proper to serve as a pecking target. To prevent excessive release of water by mature birds, the plunger end presents a relatively small target and the pecks not only must be applied forcefully but also in such manner as to retract the plunger axially. Such a drinking cup may be used with the water supply at a relatively low head.

A second drinking cup disclosed in my Patent 2,845,046 employs a trigger in the form of a lever that overhangs the end of such a plunger. With a moderate head of water the trigger action is sufficiently sensitive for immature birds.

Other drinking cup structures set forth in my copending application Ser. No. 494,054, filed Oct. 8, 1965, now Patent No. 3,353,518 and Ser. No. 579,810, filed Sept. 16, 1966 are characterized by the use of a trigger that is initially highly sensitive for use by immature birds and provision is made for reducing the sensitivity of the trigger action for use by adult birds. The sensitivity may be reduced by increasing the supply pressure and/or either substituting a less sensitive trigger or removing part of a trigger to reduce its sensitivity.

A clear need exists for a single trigger mechanism that will meet the requirements for young immature birds as well as requirements for adult birds and that may be used with a relatively wide range of supply pressures. In other words a drinking cup with a single trigger is needed that will combine the advantages of the above prior art devices.

For use by young birds, the trigger should be highly sensitive so that it will respond to relatively light pecking forces and the trigger should function as a float to insure the presence of water in the drinking cup at all times. Since young fowls peck in a random manner the pecking target should be relatively large and should respond to light pecks delivered from all possible angles.

A single trigger mechanism of this versatility would make it possible to meet the changing needs of growing birds without requiring the substitution of one trigger for another and without requiring any adjustment or manipulation of the trigger mechanism. The single trigger should be operative with a relatively low head of approximately 15" and, on the other hand should be operative with a relatively high head of 72".

The general purpose of the present invention is to solve the problems involved in meeting the above discussed need for improvement in this art.

Summary of the invention

In the new valve operating mechanism, the valve member has the usual operating extension that extends through the valve seat into the water supply passage downstream from the valve seat but this extension terminates at a point in the supply passage that is substantially spaced from the interior of the drinking cup proper. In the region of the end of the operating extension of the valve, the supply passage is formed with an annular shoulder that faces upstream. A buoyant trigger member to exert force on the operating extension of the valve member is in the form of a disk with an axial stem to serve as an operating arm. The disk seats in the supply passage in such manner as to serve as a second-class lever to fulcrum against the shoulder for the purpose of actuating the valve member. The axial stem or operating arm extends rigidly from the disk through the supply passage into the interior of the drinking cup to serve as a pecking target for operation of the valve mechanism. A relatively long trigger member affording high leverage advantage may be employed with any desired portion of the trigger exposed in the drinking cup proper. The trigger member may be molded from a suitable plastic of less specific gravity than water such as polypropylene.

A further feature of the invention that is of advantage for immature fowls is the concept of reducing the lower interior of the cup in cross section to form what may be termed a bottom receptacle into which the operating stem of the trigger protrudes to whatever degree is desired. One advantage of reducing the size in plan of the body of water that is normally retained in the drinking cup is that the target portion of the trigger may occupy a relatively large proportion of the area in plan to increase the probability that a random peck by an immature fowl will make operating contact with the trigger. For this purpose the target portion of the trigger may be enlarged to any desirable degree and the enlarged target portion may extend well into the interior of the bottom receptacle.

It has been found that with the drinking cup shaped to provide a bottom receptacle of reduced size with the trigger target extending into the interior of the receptacle, the trigger target may be placed at an optimum distance from the bottom wall of the drinking cup to assure that an adequate body of water will be available for the fowls and to assure that the fowls will keep feed from accumulating in the bottom of the cup.

A further feature of the preferred practice of the invention is the concept of flaring the walls of the cup above the level of the bottom receptacle into which the trigger target extends. One advantage of the flared configuration is that the inwardly inclined wall surfaces guide the bird's beaks to teh region of the trigger target to facilitate the education of the birds in the use of the drinking cup.

Another advantage is that the flared cup configuration eliminates a cause of injury to the bird's wattles. A still further advantage of the flared rim is that the flared rim may be of adequate depth to eliminate splashing of the water out of the cup. The fowls commonly manipulate their beaks in a manner to slop out water, but the restricted dimensions of the bottom receptacle reduce the room available for such maneuvering.

The features and advantages of the invention may be understood from the following detailed description and the accompanying drawings.

Brief description of the drawings

In the drawings, which are to ge regarded as merely illustrative:

FIG. 1 is a plan view of a preferred embodiment of the invention in the form of a flared drinking cup;

FIG. 2 is a longitudinal sectional view of the valve mechanism in its normal static state;

FIG. 3 is a fragmentary transverse section along the line 3—3 of FIG. 1 showing the configuration of the cage that confines the disk portion of the trigger;

FIG. 4 is a sectional view similar to FIG. 2 showing the valve mechanism operated for the release of water into the drinking cup;

FIG. 5 is a plan view similar to FIG. 1 showing the invention embodiment in a drinking cup having straight side walls; and

FIG. 6 is a longitudinal sectional view of the drinking cup shown in FIG. 5.

Description of the preferred embodiments

Referring to the first embodiment of the invention shown in FIGS. 1–3, a portion of a plastic conduit **10** of a watering system has an outlet fitting **12** bonded thereto with an internal screw thread for connection to a drinking cup generally designated **14**. The drinking cup is made of a suitable plastic reinforced by glass fibers and is provided with a nipple **15** that screws into the outlet fitting **12**. The nipple **15** provides a passage **16** through which water may flow from the conduit under control of a valve mechanism that extends through the passage.

In the construction shown, the nipple **16** is made of the same plastic as the cup and is molded separately from the cup, the nipple being bonded to the cup by a suitable cement. The end of the nipple **15** may form a convex conical valve seat for cooperation with an elastomeric valve member **18**, but preferably such a valve seat is formed by a conical enlargement **20** of a tube **22** that is fixedly mounted to the nipple by a suitable cement.

The elastomeric valve member **18** is cup-shaped for cooperation with the convex conical valve seat **20** and is mounted on an enlargement **24** of a pin **25** that is slidingly mounted in the tube **22** with sufficient clearance for adequate water flow through the tube. Preferably, both the tube **22** and the pin **25** are made of a suitable plastic. The inner end of the pin **25** is formed with an enlargement **26** which is tapered as shown to permit the pin to be assembled to the tube by forcing the enlargement through the tube. The enlargement **26** of the pin serves as a stop in cooperation with the inner end of the tube **22** to prevent withdrawal of the pin from the tube. The length of the pin **25** to the enlargement **26** is sufficient to permit the valve member **18** to move from an open position to a closed position against the valve seat **20**. The pin **25** constitutes in effect an operating extension of the valve member **18** by means of which the valve member may be operated to control the release of water into the cup **14**.

A trigger, generally designated **30**, for acting on the pin **25** to control the valve member **18** functions both as a float and a second-class lever and provides sufficient leverage for operation by the pecking force of a fowl to open the valve in opposition to a head of water of a magnitude on the order of six feet. The trigger is a one-piece molded plastic body having a disk portion **32** and a stem or operating arm **34** which projects axially from the disk and terminates in a suitable buoyant enlargement or pecking target **35** inside the drinking cup. The disk portion **32** of the trigger is confined in a cage **36** which is provided with three equally circumferentially spaced guide ribs **38** the guide ribs being shown in section in FIG. 3.

The disk portion **32** of the trigger is adapted to back against an inner circumferential shoulder **40** at slight spacing from the inner end of the pin **25** when the valve member **18** is firmly seated by the pressure of the water supply. In other words, care is taken that the pin **25** is not too long to prevent snug seating of the valve member **18**.

It is apparent that if a purely axial force is applied to the end of the pecking target **35** to cause purely axial translation of the disk portion **15**, the axial translation against the inner end of the pin **25** will unseat the valve member **18**. It is further apparent in FIG. 4 that if a pecking force from any radial direction is applied to the pecking target **35**, the disk portion **32** will tilt to fulcrum against the inner circumferential shoulder **40** and thus act against the inner end of the pin **25** to unseat the valve member **18**, the location of the fulcrum force against the inner circumferential shoulder depending upon the radial direction of the pecking force. Thus the trigger **30** is not only a float but als a sensitive lever that functions universally in the sense that it will operate in the radial plane of any radial force that is applied to the target **35**.

If the pressure of the supply water against the valve member **18** is only moderate or relatively low the weight of the operating arm **34** and the pecking target **35** are sufficient to unseat the valve member **18** in the absence of water in the cup **14**. When the water rises high enough in the cup to lift the operating arm to approximately horizontal position the valve member **18** seats to cut off the flow. The buoyancy of the operating arm and its enlargement are not intended to be sufficient to unseat the valve member **18** in the event that the water level rises unduly in the cup.

A difficulty with drinking cups of this general character is that foreign particles such as particles of feed and grains of sand commonly migrate from the interior of the cup into the flow passage **16** to clog the valve mechanism. In this regard a feature of the present invention is that the stem or operating arm **35** of the trigger **30** is small relative to the surrounding passage **16** to provide freedom for universal swinging of the trigger and consequently the annular space in the passage **16** around the stem or operating arm is so liberal that clogging does not occur. The liberal clearance prevents clogging material from being wedged in place and any material that does enter the annular clearance space is promptly flushed out of the annular space the next time that the trigger is actuated.

A feature of the embodiment of the invention shown in FIGS. 1 to 3 is that the lower portion of the drinking cup **14** is reduced in cross section to form what may be termed a bottom receptacle **42** which is formed with a rim **44** slightly above the level of the pecking target **35**. Above the rim **44** the walls of the drinking cup **14** are flared so that the upper rim proper **45** of the cup is of relatively large diameter. Since normally the water level in the cup is no more than ⅛ of an inch above the pecking target, the water level does not ordinarily rise to any substantial height above the inner rim **44** that defines the bottom receptacle **42**. The depth of the bottom receptacle **42** as measured from the underside of the pecking target **35** is on the order of ⅜ inch.

A number of important advantages are inherent in the spatial relationship of the pecking target **40** and the surrounding interior of the drinking cup. Of special importance in the training of young fowls to use the drinking cup is the fact that the pecking target **35** occupies a large proportion of the area in plan of the bottom receptacle **42**, the pecking target extending at least approximately half way across the bottom receptacle to greatly increase the chance that a random peck will make impact against the trigger target. It is also conducive to the training of the immature fowls that the tapered wall above the bottom receptacle guides the beaks of birds to the region of the pecking target.

An important requirement in any installation of drinking cups of this type is that the floor around each drinking cup be kept dry. If spillage occurs to dampen the floor, an unsanitary condition is created and especially so be-

cause dampened feed particles spoil to cause illness among the fowls. A common cause of spillage is that the fowls manipulate their tongues inside the drinking cup in such manner as to splash water over the rims of the cups. It has been found that in the present drinking cup construction the clearance between the pecking target **35** and the surrounding bottom receptacle **42** is so narrow as to preclude the undesirable tongue action.

A further consideration in the design of a drinking cup for poultry is the problem of accumulation of feed particles in the bottom of the cup. In the present cup construction, the bottom receptacle **42** is sufficiently shallow for the birds to readily reach any food particles in the bottom of the cup so that no accumulation of the food particles occurs. If the bottom receptacle **42** were much deeper, feed particles would accumulate and spoil to the detriment of the health of the fowls and on the other hand, if the bottom receptacle **42** were much shallower than ⅜ inch, insufficient water would be exposed for availability of the fowls.

Another advantage of the particular cup configuration shown in FIGS. 1 and 2 relates to the fact that the wattles of fowls are commonly injured by the rims of drinking cups. It has been found that in too many instances when a fowl attempts to peck at a trigger target, the fowl's wattles make injurious impact against the rim of the drinking cup. When, however, a fowl uses a drinking cup of the configuration shown in FIG. 2, the fowl reaches over the wide upper rim **45** with the result that the upper rim is out of the range of the wattles when the fowl pecks against the trigger target **35**.

The second embodiment of the invention shown in FIGS. 5 and 6 is largely identical with the first embodiment as indicated by the use of corresponding numerals to indicate corresponding parts. The sole difference is in the configuration of the drinking cup **14***a*. The drinking cup **14***a* is of a well known configuration that is suitable for adult birds who are thoroughly trained in the use of such a drinking cup.

It is to be noted that although the described valve mechanism will operate to control water at a relatively low pressure head of 10 to 15", it functions just as effectively with a water head on the order of 72". The sensitivity of the trigger action, i.e. the responsiveness of the trigger to pecking force does, however, vary with the pressure head. With a relatively low water head on the order of 15", the trigger is sufficiently sensitive for training young birds. On the other hand, with a substantially higher pressure, the trigger action is satisfactory for adult birds. For adult birds the degree of sensitivity of the trigger action is not critical and with a pressure head of six feet in a supply line, branches of the supply line may function satisfactorily to supply water to fowls in three tiers of cages.

I claim:

1. In a drinking cup for connection to a water source for supplying water to fowls, wherein a flow passage from the source is provided with a valve seat and leads to the interior of the cup and wherein a valve member is normally held in the seat by pressure from the source and has an operating extension extending through the seat towards the cup, means to exert force on said operating extension to shift the valve member axially to open position, said means comprising:

a shoulder formed in said passage adjacent the end of said operating extension of the valve member and spaced radially from the end of the operating extension, said shoulder facing upstream; and

a second-class lever fulcrumde against said shoulder and having an operating arm extending out of the discharge end of the passage into the cup, said operating arm being of smaller cross section than the corresponding portion of the passage to provide freedom for swinging movement of the operating arm whereby the valve member may be shifted to open position by the force of pecks of the fowls directed against the operating arm of the lever laterally of the axis of the passage.

2. The combination as set forth in claim **1** in which said lever comprises a disk in engagement with said shoulder and further comprises a stem extending rigidly from the disk into the drinking cup to serve as said operating arm.

3. A combination as set forth in claim **2** in which said stem is an axial stem and said shoulder is effective around the entire inner circumference of the passage whereby said operating arm is movable in any radial direction to shift said valve member to open position.

4. A combination as set forth in claim **3** in which said disk and axial stem comprise a molded body of plastic material of less specific gravity than water.

5. In a drinking cup having a passage connected to a source of water under pressure for supplying water to fowls, a valve mechanism operable by pecking force to control water flow into the cup, comprising:

a valve seat facing upstream in said passage;

a valve member normally held in closed position against said valve seat by the pressure of the water, said valve member having an operating extension of less cross section than the passage extending downstream through the valve seat;

an inner circumferential shoulder formed in the passage and facing upstream in the region of the end of said operating extension; and

an operating member movable against the end of said operating extension to unseat the valve member,

said operating member having a disk portion adjacent the end of the extension in abutment with said shoulder and further having an arm portion of less cross section than the passage projecting from the disk through the passage into the cup,

whereby lateral pecking force against the arm portion fulcrums the disk against the shoulder to rock the disk against said extension.

6. A combination as set forth in claim **5** in which said operating member is a molded plastic part with an enlargement on the end of the arm portion to serve as a pecking target.

7. A device of the character described for connection to a water source for supplying water to fowls, comprising:

a drinking cup;

means to connect the drinking cup to a source of water, said connecting means forming a water passage directed into the interior of the drinking cup;

valve means to control water flow through said passage, said valve means being normally biased to closed position;

control means to open said valve means, said control means including a trigger having a target portion inside the drinking cup, said trigger being effective to open said valve means in response to the impact of pecks of the fowls against the target portion of the trigger,

said drinking cup having an upper portion and a lower portion of a different configuration than the upper portion to hold a body of water, said trigger target extending into the lower portion of the cup to maintain a body of water in the lower portion, said upper portion of the cup being flared above the water level to a substantially greater area in plan than the lower portion, providing a means to cause the fowls to reach over the flared upper portion to peck the trigger target to reduce the possibility of the fowls striking the lower parts of their beaks against the flared rim of the cup, the flared portion of the cup further serving to guide the fowls' beaks to the region of the trigger target.

8. A device as set forth in claim **7** in which the distance of the bottom wall of the drinking cup from the underside of the trigger target is approximately ⅜" to provide

a body of water sufficient to attract the fowls without the body of water being so deep as to keep the fowls from removing feed material from the bottom of the cup to prevent the accumulation of feed material in the cup.

9. A device as set forth in claim **7** in which said trigger target extends at least approximately half way across the lower portion of the drinking cup for high probability that a random peck by an immature fowl will make contact with the trigger target.

10. A device of the character described for connection to a water source for supplying water to fowls, comprising:

a drinking cup;

means to connect the drinking cup to a source of water, said connecting means forming a water passage directed into the interior of the drinking cup,

said drinking cup having a lower portion to hold a body of water and an upper portion above the lower portion, said upper portion of the cup being flared to a substantially greater area in plan than the lower portion to cause the fowls to reach over the flared upper portion to peck the trigger target to reduce the possibility of the fowls striking the lower part of their beaks against the rim of the cup;

a valve seat facing upstream in said passage;

a valve member biased to closed position against said valve seat, said valve member having an operating extension of less cross section than the passage extending downstream through the valve seat;

an inner circumferential shoulder formed in the passage and facing upstream in the region of the end of said operating extension; and

an operating member movable against the end of said operating extension to unseat the valve member,

said operating member having a disk portion adjacent the end of the extension in abutment with said shoulder and further having an arm portion of less

cross section than the passage projecting from the disk through the passage into the cup,

whereby lateral pecking force against the arm portion fulcrums the disk against the shoulder to rock the disk against said extension,

said arm portion of the operating member terminating in an enlarged pecking target in said lower portion of the drinking cup.

11. A device as set forth in claim **10** in which the distance of the bottom wall of the drinking cup from the underside of the trigger target is approximately ⅜" to provide a body of water sufficient to attract the fowls without the body of water being so deep as to keep the fowls from removing feed material from the bottom of the cup to prevent the accumulation of feed material in the cup.

12. A device as set forth in claim **10** in which said trigger target extends at least approximately half way across the lower portion of the drinking cup for high probability that a random peck by an immature fowl will make contact with the trigger target.

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U.S. Cl. X.R.

137—410; 251—231