

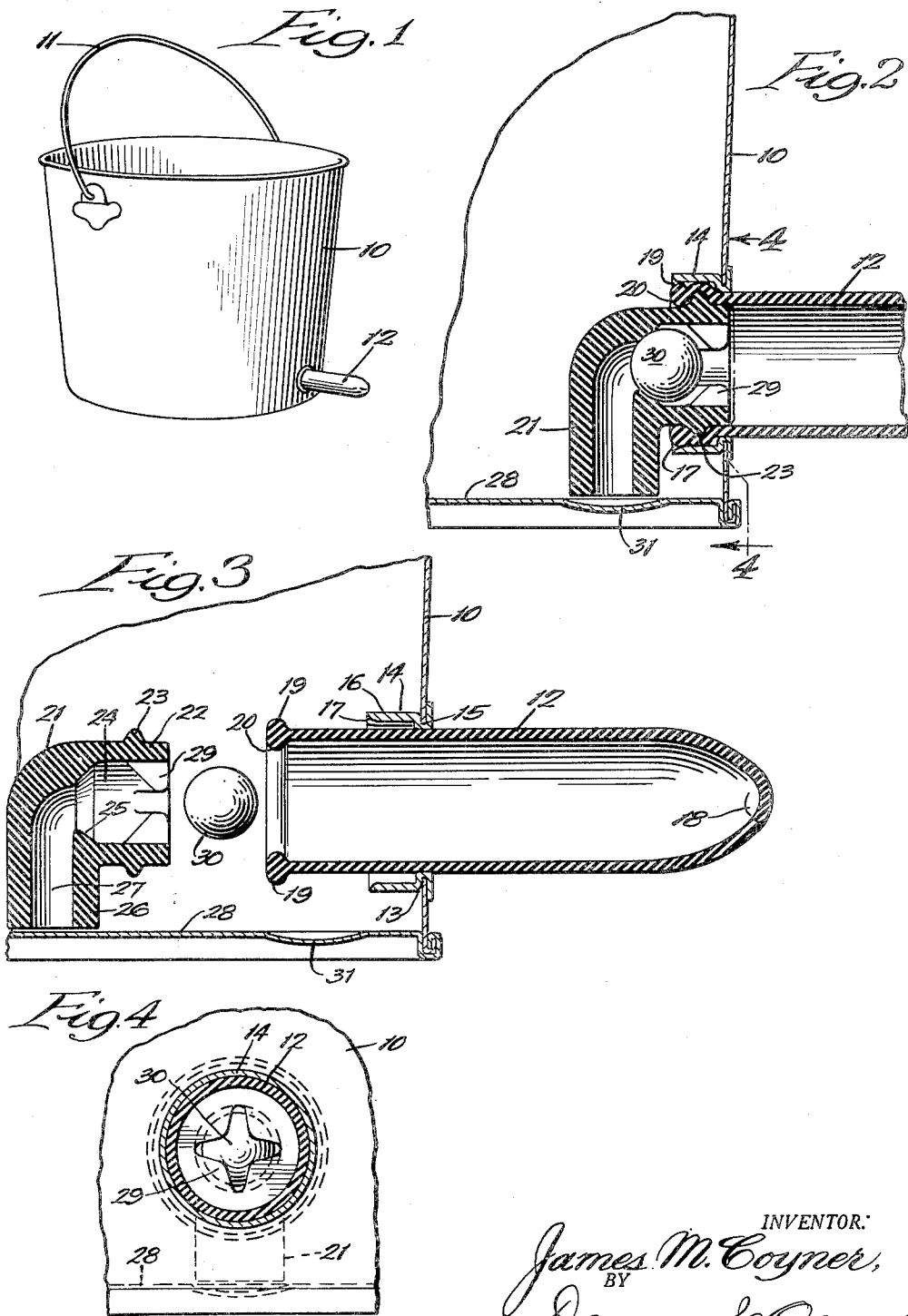
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NIPPLE-EQUIPPED FEEDER PAIL

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## NIPPLE-EQUIPPED FEEDER PAIL

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This invention relates to a nipple-equipped feeder pail, and more particularly to a nipple-equipped pail adapted for the feeding of milk and other liquids to calves and other animals.

In feeder pails heretofore employed, a serious problem has been presented with regard to the ready replacement of worn-out nipples while at the same time securing the new nipple tightly in position so that it will not be pushed inwardly or pulled outwardly by the strain exerted thereon by the sucking calf. Further, the nipple must be removed after each feeding for washing and cleaning and then reassembled for the next feeding. Such successive cleaning and reassembling after each feeding is highly important from the standpoint of sanitation which is vital to the successive feeding of calves. There has long been a need for a structure which would permit a farmer to replace a worn-out nipple quickly and securely without the necessity of using tools, while at the same time anchoring the tube against movement in either direction by the calf, etc.

An object of the present invention is to provide a nipple-equipped feeder pail satisfying the above need and requirements. Yet another object is to provide a feeder pail structure from which a used nipple can be readily removed while at the same time permitting the new nipple to be secured firmly in position and in attached relation to a drain or valve tube. Yet another object is to provide a nipple having means cooperating with a drain or valve tube whereby the two may be releasably secured together and anchored in position within the ferrule of the pail. A still further object is to provide a valve tube adapted to be secured to the nipple and having resilient portions permitting the ball of the valve to be readily inserted therein. A still further object is to provide a structure whereby old parts heretofore thought necessary are eliminated and in which the nipple and valve tube are anchored firmly within a ferrule having a bell-shaped mouth, the nipple being provided with a double bead cooperating with a bead upon the valve tube whereby the parts may be readily assembled in secure position against dislodgement except when it is desired to remove the parts when worn or for cleaning. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown in an illustrative drawing, in which—

Figure 1 is a perspective view of a nipple-equipped feeder pail embodying my invention; Fig. 2, a broken enlarged vertical sectional view of a portion of the feeder pail equipped with a

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nipple and valve tube; Fig. 3, a view similar to Fig. 2 but showing the parts in separated relation; and Fig. 4, a broken sectional view, the section being taken as indicated at line 4—4 of Fig. 2.

In the illustration given, 10 designates a pail which may be equipped with a bail 11 and with a nipple 12.

The pail 10 is preferably provided along one side and near the bottom with an opening 13, into which is secured a ferrule 14. The ferrule 14 is provided with a recess 15 receiving the edge of the pail about the opening so that the ferrule is thus securely anchored in position upon the pail and about the opening. If desired, solder or other means may be employed for securing the ferrule rigidly in position.

The ferrule 14 is provided with a rearwardly or inwardly extending cylindrical portion of enlarged diameter providing a sleeve portion or tube 16 having its extreme inner end beveled at 17 to provide a bell-shaped or flared end. The end of the tube portion adjacent the wall of the pail provides an annular shoulder forming an abutment operative to prevent outward movement of the nipple 12 through the ferrule.

Within the ferrule 14 is mounted a resilient nipple 12, which may be formed of rubber or other suitable material and which preferably is provided with a crescent-shaped slit 18 at its outer end to provide a flap valve for the flow of milk or other liquid from the nipple.

The inner end of the nipple is provided with a double bead having an outwardly extending bead portion 19 and an inwardly extending bead portion 20. The two beads at the open end of the nipple 12 serve important functions which will be later described.

I provide a drain or valve tube 21 which may be shaped like an elbow and which has a horizontally extending portion 22 adapted to be received within the open end of the nipple 12. The portion 22 is preferably provided with a nipple or laterally-extending annular bead 23 adapted to extend to the inner side of the bead 20, as shown more clearly in Fig. 2.

The drain tube 21 is preferably provided with a valve chamber 24 having a valve seat 25 therein. The downwardly turned leg 26 of the valve or drain tube 21 is provided with a passage 27 leading from the chamber 24 to the bottom 28 of the pail 10.

I prefer to equip the tube 21 with inwardly-extending fins or resilient arms or flaps 29 which will yield sufficiently to permit the ball 30 to be inserted within the chamber 24. In the specific

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illustration given, I have formed the entire tube 21 of rubber which is relatively hard but resilient enough to permit the ball or marble 31 to be inserted within the chamber 24.

In order to facilitate the removal of the liquid to the very last portion thereof, I prefer to form the bottom 28 with a slight recess 31 just below the open end of the tube 21, as shown more clearly in Fig. 2.

#### Operation

When it is desired to assemble the parts, as shown in Fig. 3, the nipple 12, which has a diameter preferably slightly larger than the inner diameter of the ferrule, is drawn through the inwardly-extending tubular portion 14 of the ferrule and through the ferrule opening to about the extent illustrated in Fig. 3. The ball 30 is inserted within the chamber 24 and the straight portion 22 of the tube 21 is inserted within the nipple 12 to bring the annular bead 23 thereof inwardly of the bead 20 of nipple 12. With the parts thus assembled, the nipple 12 is drawn forwardly to the position illustrated in Fig. 2. It will be noted that when the outer bead 19 strikes the bell-shaped or flared end 17 of the ferrule 14, the two beads are pressed downwardly into tight, locking relation about the inner bead 23 of the tube 21. Thus the nipple 12 is locked securely against outward movement. At the same time, the resilient engagement of the nipple 12 against the ferrule prevents the nipple from being pushed inwardly. The valve tube 21 is held securely against dislodgement and the entire tube and nipple combination are held in firm, anchored position so that no matter to what extent pressures or tensions are placed upon the nipple by the calf, etc., the parts are held securely in position.

When, however, it is desired to remove the nipple for replacement, it is merely necessary to draw the tube 21 from the inside of the pail inwardly so as to release the beads 19 and 20 from engagement with the bell-shaped or beveled edge 17 of the ferrule. The tube 21 may then be readily separated from the nipple and the nipple may be drawn inwardly within the pail to free it from the ferrule 14.

In the above structure, various parts such as a ring, etc., heretofore felt necessary, have been eliminated. The contour of the ferrule is such that the bead of the nipple is pressed firmly over the raised collar or bead of the valve tube, thus sealing the nipple, preventing leakage, and providing for quick and easy removal. The ball can be pressed in from the forward end and is held in place by the resilient knobs or fins 29 on the interior end of the valve tube. The valve tube itself, by reason of its gooseneck shape, extends to the bottom of the pail so as to suck up every drop of milk. By providing the beveled or bell end of the ferrule, the valve tube and nipple, after being readily assembled with their interlocking beads, can be drawn quickly into the compressed locking position illustrated in Fig. 2, preventing dislodgement of the parts during operation.

The design of the ferrule is such that it can be attached to the feeder pail by the simple process of "rolling" instead of soldering or by the use of threads.

While in the foregoing specification I have set out of specific structure in considerable detail for the purpose of illustrating one embodiment of the invention, it will be understood that the

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details of structure may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a feeder pail structure, a pail having an opening in a side wall thereof and adjacent its bottom wall, a ferrule secured to said pail about said opening and having an inwardly-extending portion providing a cylindrical tube, a resilient nipple extending through said ferrule and equipped at its inner end with an enlarged and annular bead, and a drain tube equipped with a laterally-extending annular bead and received within the end of said nipple so that the nipple bead is on the inner side of the bead on said drain tube, the nipple bead having a greater outer diameter than the inner diameter of said cylindrical tube of the ferrule and a smaller inner diameter than the outer diameter of said drain tube so that when said nipple and drain tube are received within the cylindrical tube of said ferrule, the nipple bead is compressed between the drain tube and cylindrical tube of the ferrule and provides a liquid tight seal therebetween.

2. A feeder pail device, comprising a pail having an opening in the side wall thereof adjacent its bottom wall, a ferrule secured to said pail about said opening and equipped with a cylindrical portion of enlarged cross section extending inwardly and into said pail, a resilient nipple extending through said ferrule and equipped at its inner end with an enlarged annular bead, and a drain tube equipped with a laterally-extending annular bead and being mounted within the inner end of said nipple with the bead on said nipple being inwardly of the bead on said drain tube, the bead on said nipple having a slightly greater outer diameter than the inner diameter of said cylindrical portion of the ferrule and a slightly smaller inner diameter than the outer diameter of said drain tube, said drain tube and the nipple mounted thereon being received within the cylindrical portion of said ferrule so that the bead of said nipple is compressed between said drain tube and said cylindrical portion of the ferrule to provide a liquid-tight seal, the enlarged portion of said ferrule providing an annular shoulder adjacent the side wall of said pail to provide an abutment operative to prevent the withdrawal of said nipple and said drain tube through said opening in the pail.

3. A feeder pail, comprising a pail having an aperture in a wall thereof and adjacent its bottom wall, a ferrule secured to said pail and providing an liquid tight seal therewith and having a portion of cylindrical shape and enlarged diameter extending inwardly and into said pail, a drain tube mounted within said portion of enlarged diameter and being equipped with an outwardly-extending annular bead, a resilient nipple mounted upon said tube and extending through said aperture and outwardly from said pail, said nipple being equipped at its inner end with an enlarged annular bead mounted inwardly of the bead on said drain tube and being squeezed between said drain tube and the cylindrical portion of said ferrule to provide a liquid tight seal therebetween, and a check valve mounted within said drain tube and being operative to permit the flow of liquid through said tube and outwardly through said nipple while preventing the flow of liquid in the reverse direction.

4. The structure of claim 3 in which said drain

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tube is arcuate and provides a portion extending downwardly toward the bottom wall of said pail, and the inner edge of the cylindrical portion of said ferrule is bell-shaped to provide ready insertion of said nipple and drain tube and the beads thereof into the cylindrical portion of the ferrule.

5. A feeder pail device, comprising a pail providing a chamber therein and having an aperture in a side wall thereof, a ferrule mounted in said aperture and rigidly secured to said pail to provide a liquid tight seal therewith, said ferrule having an inwardly-extending tubular portion of enlarged cross section providing an annular shoulder adjacent the side wall of said pail and on the inner side thereof, a drain tube mounted within said tubular portion of enlarged cross section and having the downwardly-turned portion terminating adjacent the bottom wall of said pail, said drain tube being equipped with an outwardly-extending bead received within the tubular portion of said ferrule and being spaced therefrom, a resilient nipple equipped at its inner end with an enlarged annular bead, said nipple being mounted upon said drain tube with the beaded end thereof on the inner side of the bead on said drain tube, the bead on said nipple having an outer diameter slightly greater than the inner diameter of said cylindrical portion of the ferrule and an inner diameter slightly less than the outer diameter of said drain tube whereby the nipple bead is squeezed between the cylindrical portion of the ferrule and the drain tube to provide a liquid seal therebetween, said shoulder providing an abutment operative to prevent the

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withdrawal of said nipple and said drain tube outwardly through said ferrule, said drain tube being formed of a resilient material and providing a valve seat therein, and a valve mounted within said drain tube and operative with said seat to permit the flow of fluid through said drain tube and outwardly through said nipple while preventing the flow of fluid in the reverse direction.

6. The structure of claim 5 in which said drain tube is equipped with inwardly-extending fins adjacent the bead-equipped end thereof and spaced from said seat, said fins providing a stop means to confine said valve within said drain tube, said fins also being yieldable so that said valve may be inserted into and withdrawn from said drain tube.

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