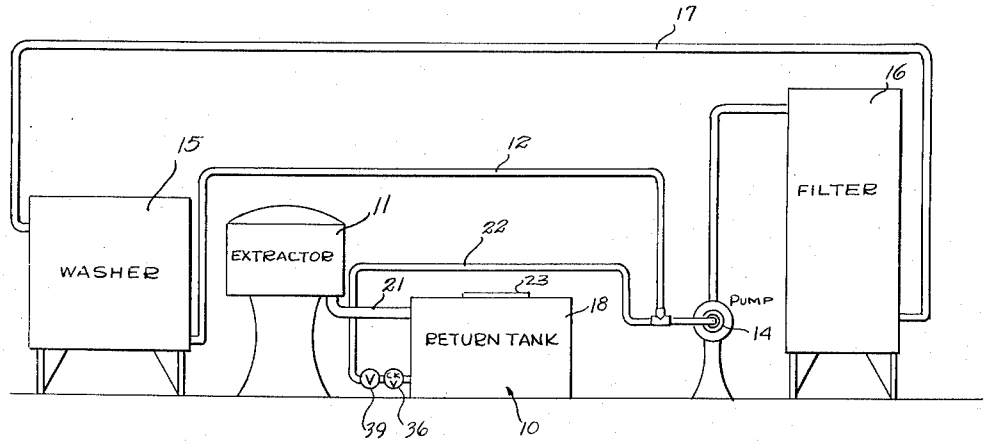
May 28, 1957 R. J. EVANS 2,793,652

LIQUID COLLECTION AND RETURN DEVICE

Filed June 11, 1954

FIG. 1.



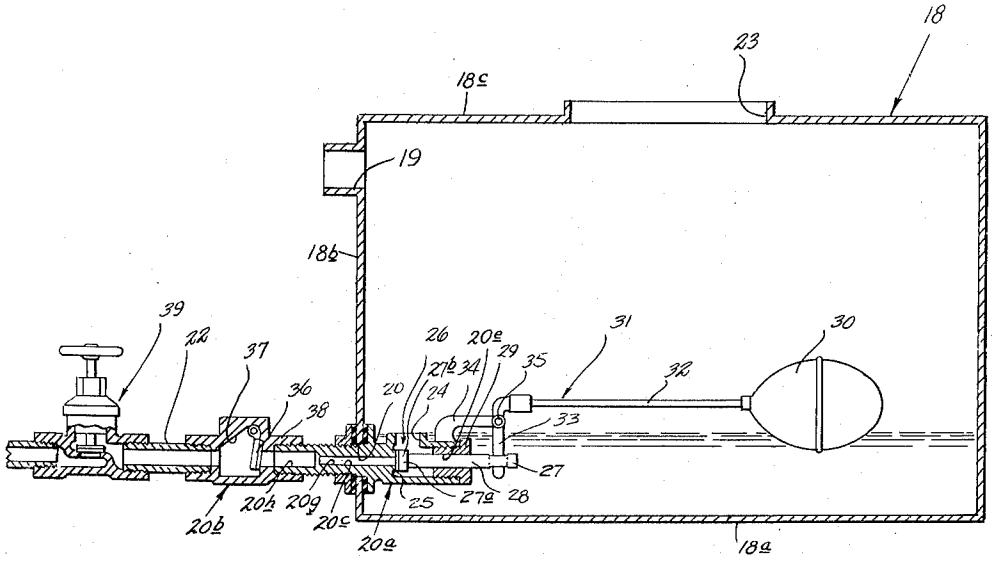


FIG. 2.

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LIQUID COLLECTION AND RETURN DEVICE

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1 Claim. (Cl. 137—399)

This invention relates to a liquid collection and return device.

An object of the invention is to provide a device, insertable into a conventional dry cleaning system without substantial alteration to the system, for collecting dry cleaning liquid extracted from clothes which have been cleaned and returning the liquid to the system for cleaning and reuse.

Another object of the invention is to provide a device of the character above referred to which utilizes the existing pump of a cleaning system and which automatically ceases operation when the quantity of liquid to be returned is reduced to a small amount, in order to avoid injecting any air into the cleaning system.

Other objects and advantages of the invention will appear from the following description considered in conjunction with the attached drawing, in which:

Figure 1 is a diagrammatic elevational view showing a device according to the present invention as inserted in a conventional dry cleaning system.

Figure 2 is a vertical longitudinal section through the said device.

Referring now to the drawings in more detail, and particularly to Figure 1, the reference numeral **10** designates generally the illustrated device, which is shown as inserted in a conventional dry cleaning system which includes an extractor **11** and a first conduit **12** having one end connected to the intake of the pump **14** and having its other end connected to a source containing spent dry cleaning liquid, specifically a washer **15**. The outlet of the pump **14** is connected to a filter **16** from which a return line **17** conducts the filtered cleaning liquid to the washer **15**.

The device **10** collects spent dry cleaning liquid draining from the extractor **11** and the spent liquid passes through the conduit **12** to the pump **14**. The device **10** includes a tank **18** having a bottom **18***a* and a side wall **18***b*. The tank **18** is provided in the top **18***c* with an opening **23** for ready inspection of and access to the interior thereof. An inlet **19** traverses an upper part of the side wall **18***b* and an outlet conduit **20** traverses the side wall **18***b* below the inlet **19**, the conduit **20** having an inner end portion **20***a* within the tank **18** and an outer end portion **20***b* outside the tank **18**. A second conduit **21** connects the extractor **11** to the tank inlet **19**, and a third conduit **22** connects the tank outlet **20** to the first conduit **12**. As will be apparent from Figure 2, the inner and outer end portions **20***a* and **20***b* are horizontal. The inner end portion **20***a* has a first axial passage **20***c* extending therethrough, the passage **20***c* having a terminal inner end **20***e* through which the said passage opens. The passage **20***c* has an enlarged diameter portion which is spaced from the terminal end **20***e* of the inner end portion **20***a* and defines a first valve chamber **26**. A valve seat **25** is at the end of the first valve chamber **26** remote from the terminal end **20***e* of the inner end portion **20***a*. A lateral upwardly facing port **24** traverses the inner end portion **20***a* and opens into the first chamber **26**. A valve stem **28** works in the first passage **20***c*, the stem having

an inner end **27** extending beyond the terminal inner end **20***e* and an outer end **27***a* positioned in the first chamber **26**. A valve head **27***b* is on the outer end **27***a* for engagement with the valve seat **25**.

A float arm **32** is pivotally mounted on the inner end portion **20***a* of the conduit **20** and is operatively connected to the inner end **28** of the valve stem **27**. As shown in Figure 2, the arm **32** has a float **30** on one end and has the other end attached to the upper end of an upstanding lever **33**, the lever being pivotally connected intermediate its ends as at **35** to a bracket **34** carried by the inner end portion **20***a* of the conduit **20**. The lower end of the lever **33** is connected to the valve stem **27** inwardly of the inner end **28** thereof. The outer end portion **20***b* of the conduit **20** has a second axial passage **20***g* which communicates with and is aligned with the first passage **20***c* of the inner end portion **20***a* of the conduit **20**. The second passage **20***g* has an inner end **20***h* communicating with the first passage **20***c* and an enlarged diameter portion between the ends of the second passage **20***g* and defining a second valve chamber **37**. A valve seat **38** is on the ends of the second chamber adjacent the first passage **20***c*, and a check valve **36** in the second chamber **37** is normally in closing engagement with the seat **38** in the valve chamber **37**. The check valve is free to swing outwardly away from its seating position and the movement of liquid outwardly from the tank **18** through the conduit **22** swings the check valve **36** to the open position. Any backward flow of liquid in the conduit **22**, however, toward the tank **18**, will swing the check valve **36** downwardly against the seat **38**, closing the conduit **22** and preventing the movement of the liquid backwardly into the tank **18**.

A hand actuable valve **39** may be inserted in the conduit **22**, exteriorly of the chamber **37**, for positively shutting off the conduit **22** when the device of the present invention is not in use.

It will be apparent from the foregoing description that the device of the present invention affords a simple and automatic means for collecting dry cleaning liquid extracted by the extractor **11** from clothes which have come from a washer **15** and for returning the liquid so collected into the dry cleaning system. As the dry cleaning liquid is extracted from the clothes in the extractor **11**, it drains through the conduit **21** into the tank **18**. When the level of liquid in the tank **18** becomes sufficiently high to raise the float **30**, the movement of the lever **31**, connecting the float **30** and the valve **26**, causes the opening of the valve **26** and permits the liquid to enter the conduit **22**. Inasmuch as the other end of the conduit **22** is connected to the intake of the pump **14**, the liquid entering the conduit **22** from the tank **18** will be drawn through the conduit **22**, so long as the valve **39** is open, and will be pumped together with other liquid coming directly from the washer through the conduit **12**, into the filter **16** where it will be cleaned and finally discharged again through the supply line **17** to the washer **15**. The check valve **36** will be swung upwardly by the movement of the liquid outwardly from the tank **18** through the conduit **22** and will offer no resistance to the passage of the liquid in that direction. When the level of the liquid in the tank **18** falls, the float **30** will fall with it and, through the lever **31** will move the valve **36** into seating position upon the valve seat **25**, closing the conduit **22** and preventing further liquid from escaping from the tank **18**. The position of the float **30** is so adjusted that it will cause the closing of the valve **26** before the level of the liquid in the tank **18** falls below the level of the opening **24** into the conduit **22**. This adjustment prevents air from being drawn into the conduit **22** from the tank **18**, as would be the case if the valve **26** remained open after the liquid level had fallen below that of the opening **24**. The open-

ing 23 in the top of the tank 18 permits ready access to the interior of the tank for cleaning, adjustment of the float 30, or for any other purpose. It will be evident that the addition of the device of the present invention to an existing dry cleaning system will be a simple and inexpensive matter, inasmuch as the device utilizes the pump already in the system and its installation requires no substantial alteration of the system.

What is claimed is:

A device of the character described, a tank having a bottom and a side wall, an inlet traversing an upper part of the side wall, an outlet conduit traversing said side wall below said inlet, said conduit having an inner end portion within the tank and an outer end portion outside of the tank, said inner and outer end portions being horizontal, said inner end portion having a first axial passage extending therethrough and having a terminal inner end through which said first passage opens, said first passage having an enlarged diameter portion spaced from the terminal end of the inner end portion and defining a first valve chamber and a valve seat at the end of the first chamber remote from said terminal end, a lateral upwardly facing port traversing said inner end portion and opening into said first chamber, a valve stem working in said first passage, said stem having an inner end extending beyond the said terminal end and an outer end positioned in said first chamber, a valve head on said outer end of the stem

for engagement with said seat, a float arm pivotally mounted on said inner end portion of the conduit and operatively connected to the inner end of the valve stem, said outer end portion of the conduit having a second axial passage communicating with and aligned with said first axial passage of the inner end portion of the conduit, said second passage having an inner end communicating with the first passage and an enlarged diameter portion between the ends of the second passage defining a second valve chamber, a valve seat on the end of the second chamber adjacent to said first passage, and a check valve in said second chamber normally in closing engagement with the seat in the second valve chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

522,668	Nagle	July 10, 1894
1,271,599	Messer	July 9, 1918
1,775,860	La Bour	Sept. 16, 1930
1,795,006	Boiney	Mar. 3, 1931
1,803,905	Kinzbach	May 5, 1931
1,920,469	Jones	Aug. 1, 1933
2,198,412	McDonald	Apr. 23, 1940

FOREIGN PATENTS

472,170	Italy	of 1950