Oct. 30, 1956 C. J. KROGEL 2,768,559

FLUID CEILINGS FOR HYDRAPULPERS

Filed Dec. 3, 1954

FIG 1

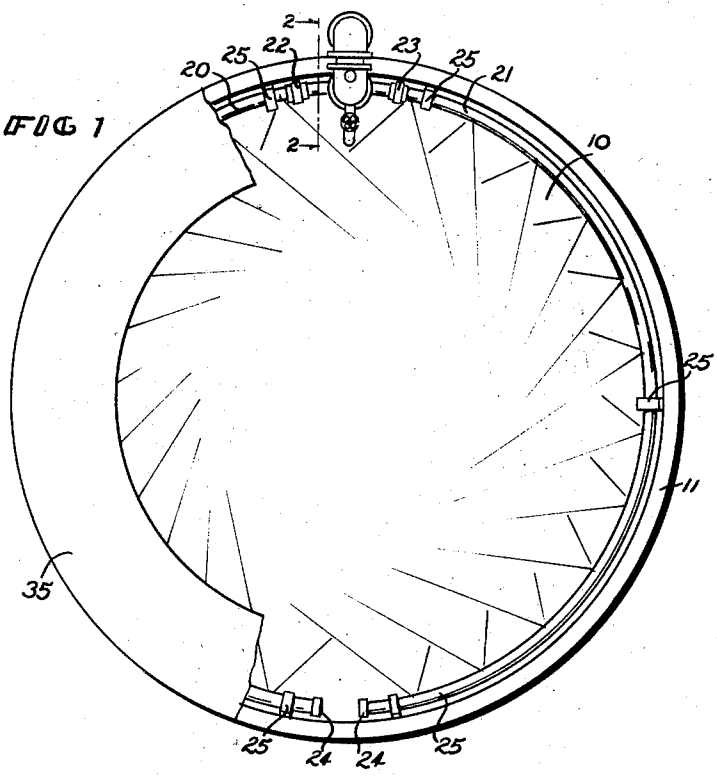


FIG 2

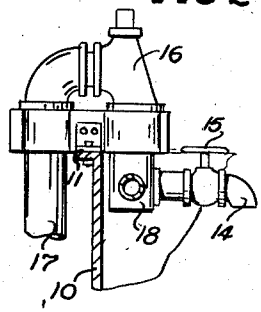


FIG 3

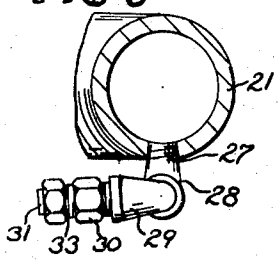


FIG 4

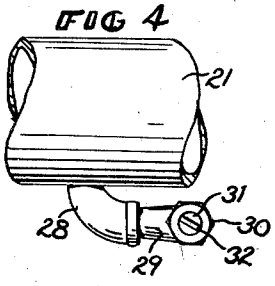
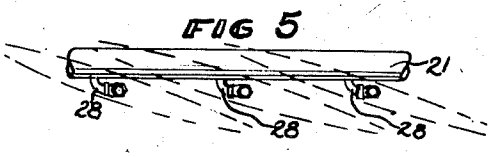


FIG 5



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FLUID CEILINGS FOR HYDRAPULPERS

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1 Claim. (Cl. 92—26)

This invention relates to mixing receptacles and particularly to means for confining the materials being mixed therein.

In the manufacture of certain types of telephone cables, the wires thereof are provided with an insulating covering formed of wood pulp which is initially beaten in units known as Hydrapulpers. In general structure a Hydrapulper is a large cylindrical tank or receptacle having an open top and at the bottom, a driven, wheel-like element with fin-like structures to tear the pulp into minute pieces and mix it thoroughly with water. During operation of a Hydrapulper, a given quantity of water is directed into the receptacle after which large bundles of pulp are dropped into the water through the open top. After a suitable time additional water is mixed with the pulp before the mixture is drained or otherwise removed from the receptacle during continued rotation of the wheel. During each cycle of operation, particularly while dropping bundles of pulp into the receptacle and near the end of the draining process, portions of the pulp may be splattered over the surrounding area on floors, ceilings, walls and other adjacent structures and also on any workers who may be in the area.

The object of the invention is to eliminate these undesirable conditions without interfering with the feeding of material to the receptacle.

With this and other objects in view, the invention comprises a fluid supply for an open top material mixing receptacle with means to form a ceiling for the receptacle of the fluid.

In the present embodiment of the invention, water under pressure is supplied from a main line to auxiliary lines to which nozzle-like units are adjustably attached to direct substantially flat, diverging sprays of the water in slanted overlapping positions to permit material to be dropped through the ceiling and into the receptacle but to prevent material from splashing out of the receptacle.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein:

Fig. 1 is a top plan view of a receptacle embodying the invention a portion thereof being broken away;

Fig. 2 is an enlarged sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view of one of the auxiliary lines illustrating one of the units;

Fig. 4 is a front elevational view of the structure shown in Fig. 3, and

Fig. 5 is a fragmentary elevational view of one of the auxiliary lines illustrating the substantially flat overlapping sprays of the group of the units.

In the present embodiment of the invention, a cylindrical receptacle **10** is a portion of a commercially known Hydrapulper having an open top **11** and the conventional rotary wheel (not shown) disposed within the tank or receptacle adjacent the bottom thereof with fins or other structures capable of beating or separating the pulp into small particles in a given quantity of water. The initial

quantity of water, or any desired portion thereof, may be added to the receptacle through a nozzle **14** of a valve **15**, connected through a pressure control unit **16** to a main supply line **17**, through which water under a given pressure is fed. It will be noted by viewing Figs. 1 and 2, that the supply line **17** extends upwardly about the adjacent flange of the open upper end **11** of the receptacle to position a portion **18**, which is interposed between the pressure regulating unit **16** and the valve **15**, at a given location below the open top **11** of the receptacle.

In the present embodiment of the invention, auxiliary fluid lines **20** and **21** are connected through couplings **22** and **23** to the portion **18** of the main supply. The auxiliary lines **20** and **21** extend arcuately adjacent the inner wall of the receptacle to positions substantially diametrically opposite their starting ends where they are closed by caps **24** which may be removed for cleaning purposes if desired. Brackets **25** secured to the inner wall of the receptacle and disposed at spaced positions serve to support the auxiliary lines **20** and **21**. The lines **20** and **21** each have a plurality of threaded openings **27** (Fig. 3) to receive what are known as street elbows **28**. Another street elbow **29** is mounted in each of the elbows **28** as illustrated in Figs. 3 and 4 and commercially known spraying units **30** are mounted in the elbows **29**.

This structure is defined as adjustable not from the viewpoint that it is necessary to repeatedly or frequently make adjustments thereof but to permit various initial adjustments to accomplish the most desirable result. All adjustments are made with consideration toward the desired position for each unit **30**. The first adjustment may be at the connection of the street elbow **28** with its respective fluid line **21** permitting rocking adjustment about the center line of the aperture **27** to position the nozzle or unit **30** relative to the vertical center line of the receptacle **10**. The next adjustable feature is the connection between the street elbows **28** and **29** permitting rocking movement of the elbow **29** to move the center line of the unit **30** through an arc to direct it upwardly, into a horizontal plane or downwardly at a desired angle therefrom. The unit **30** includes a nozzle portion **31** having a flat type outlet **32** adjustably held in the main portion **30** by a threaded nut **33**. The structure of the unit permits rocking of the nozzle portions **31** to tilt the outlet **32** into any desired angular position with respect to the center line of the unit so that sprays of fluid, such as water under pressure may be directed at any desired angle relative to the center line of the receptacle and which will widen into variable angles after leaving the unit.

An annular apron **35** fixed to the flanged open end **11** of the receptacle covers the top of the wall of the receptacle **10** and the area of the receptacle between the inner surface of the receptacle **10** and the auxiliary lines **20** and **21**, which are the portions not covered by the sprays from the units **30**. The apron **35** also covers or overlies the auxiliary pipes **20** and **21** and the units **30**, as may be seen by reference to Fig. 1. The preferred positions of the units **30** are at slight angles downwardly directed at the vertical center line in the receptacle a given distance below the plane of the open top thereof.

During the normal function of the receptacle which, in the present instance, is a Hydrapulper, the aforementioned wheel (not shown) is driven continuously while the initial quantity of the water under pressure is directed into the receptacle. This may be done through the assistance of the valve **15**, directing also fluid under pressure to the auxiliary lines **20** and **21** to form a ceiling of water spray under a sufficiently high pressure and at angles to prevent any portions of the contents of the receptacle from escaping through the open top. The numerous portions of the pulp in the receptacle which would splash out of the receptacle during normal operation of

the Hydrapulper would strike the fluid ceiling and be forced back into the receptacle. This is true also during adding of the dry pulp to the receptacle or Hydrapulper. Large quantities of the pulp may be dropped into the receptacle and this action normally would cause portions of the material in the receptacle or Hydrapulper to splash out and over the surrounding area but such results would be eliminated due to the fluid ceiling of the high pressure sprays. The fluid ceiling does not interfere with the material being dropped into the receptacle and this action is so rapid that there is no splashing of the fluid externally of the receptacle. The initial provision of substantially flat sprays for each unit and the angular overlapping relationship of these sprays is illustrated in Figs. 1 and 5, permit the water under force in each spray to travel undisturbed until it approaches the center of the ceiling area where the particles of water in the numerous sprays will unite in completing the solid downwardly dished ceiling over the receptacle.

The fluid, namely the water, used in forming the ceiling over the receptacle is not wasted, nor does it affect the function of the Hydrapulper. It may constitute all or a part of what is called make-up and wash-out quantities of water used in the normal Hydrapulping process. All of the water used for a given quantity of dry pulp is not used during the initial make-up process, that is, during the initial breaking up of the pulp. Of the initial quantity of water, a given portion thereof may be utilized in forming the fluid ceiling over the receptacle and the continued or subsequent quantity of water necessary in forming the fluid ceiling may be a part of the added or wash-out supply of water. As a result, the fluid ceiling is composed of the fluid namely water which is to be mixed with the material which, in the present instance, is wood pulp.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art

which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

In a Hydrapulper having a circular open top to receive quantities of pulp, a main supply line for fluid under pressure extending to the Hydrapulper, an auxiliary line for the fluid under pressure extending substantially around the open top, disposed adjacent the outer extremities of the open top and connected to the main supply line, outlet units disposed at spaced positions about the open top adjacent the auxiliary line and adapted to direct the fluid under pressure in substantially flat diverging sprays of predetermined angles, elbow-like elements connecting the units to the auxiliary line and adapting the units for rocking and vertical adjustments relative to the elements and the auxiliary line to cause their substantially flat sprays of the fluid under pressure to successively overlap and extend radially inwardly and downwardly to permit dropping of the quantities of pulp therethrough, to otherwise close the open top of the Hydrapulper and deflect particles, splashing upwardly toward the open top of the Hydrapulper, back into the Hydrapulper, and an annular peripheral apron mounted on the open top of the Hydrapulper and covering said units.

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