May 10, 1949. H. W. FAWCETT 2,469,956

CENTRIFUGAL SEPARATOR

Filed Jan. 13, 1947

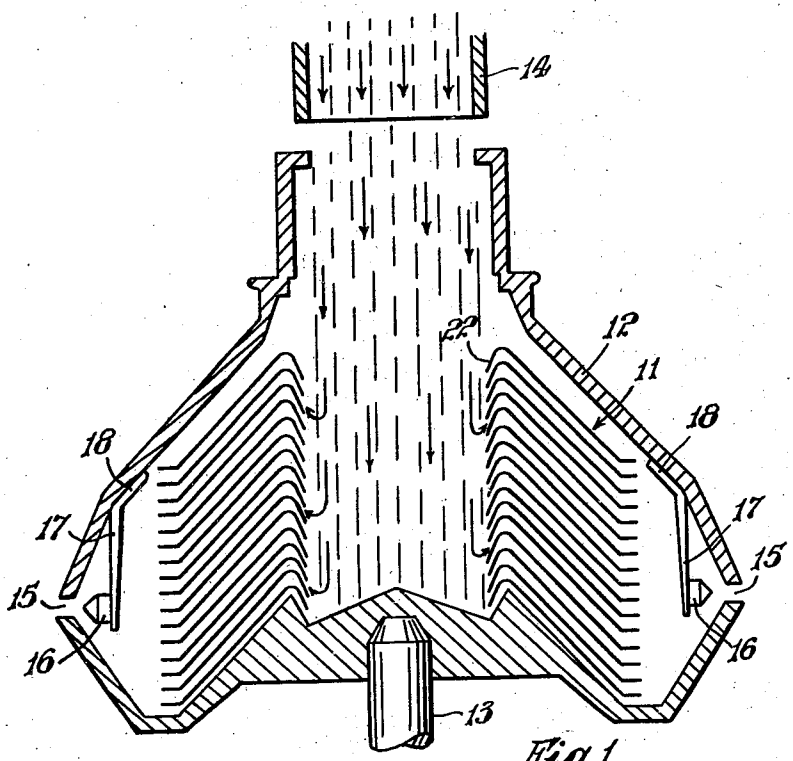


Fig. 1.

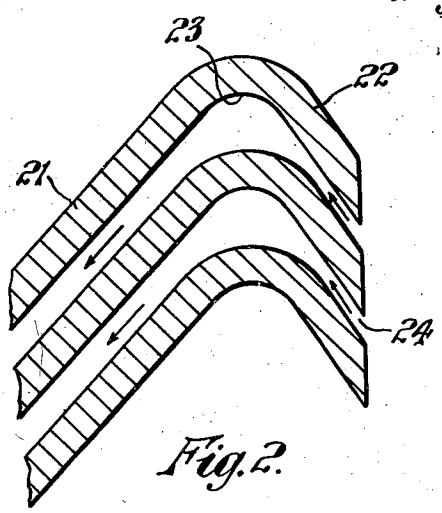


Fig. 2.

INVENTOR

HAROLD WILLIAM FAWCETT

By Richardson and Davis

ATTY'S

Patented May 10, 1949 2,469,956

UNITED STATES PATENT OFFICE

2,469,956

CENTRIFUGAL SEPARATOR

Harold William Fawcett, Harrogate, England

Application January 13, 1947, Serial No. 721,697
In Great Britain January 9, 1946

Section 1, Public Law 690, August 8, 1946
Patent expires January 9, 1966

2 Claims. (Cl. 233—43)

1

This invention relates to centrifugal separators and more especially to cream separators and aims at providing a construction of separator in which the internal parts and more particularly the discs of the disc pack can be effectively washed and cleaned during the rotation of the apparatus.

More specifically the present invention is concerned with centrifugal separators of the self-cleaning type such as described in the specification of my prior United States Patent No. 2,173,580.

A centrifugal separator of this type comprises a revoluble bowl, a pack of discs disposed in said bowl and having inner circumferential edges, a projecting baffle disposed inside or below said disc pack and having an inner peripheral edge of a diameter less than that of the inner peripheral disc edges, said baffle forming with the bottom of the bowl a distributor chamber leading the liquid to be treated to the discs intermediate the inner and outer edges thereof, a stationary support above said bowl, an imperforate supply tube mounted removably on said support and projecting freely through the inner peripheral edges of said discs and baffle, said tube being axially open at its lower end to discharge the liquid fed thereto into said distributor chamber, a feed tube for washing liquid to be mounted on said support, said feed tube projecting water centrally into the space formed by the inner edges of the discs, bottom of bowl, and the milk distributing baffle and thus permitting supply onto and throughout the circumference of the inner edge of each individual disc, and means for evacuating said washing liquid from said bowl in a substantially radially outward direction.

In washing centrifugal separators of the foregoing self-cleaning type the washing liquid supplied interiorly to the casing which is rotated, passes through the annular disc pack which acts in the manner of a pump and sucks or pumps very large quantities of water through the disc pack to effect the cleansing, but it is found that considerably greater quantities of water are used than are required for effective cleansing and, due to the centrifugal pump action of the discs, the water tends to be pumped away by the discs at the lower end of the disc pack with a consequent danger of the upper discs remaining uncleansed.

Now the discs of a normal disc pack have their inner edges arranged perpendicularly to the axis of the separator for the purpose of imparting strength to the disc pack assembly. This however provides a wide aperture for washing liquid entering between adjacent discs.

2

Among the objects of the invention are to provide a construction of centrifugal separator which, when the cleansing water is admitted, restricts the flow of water through the disc pack thus preventing discs taking more water than is necessary for washing and which better distributes the water throughout the pack to effect overall and complete cleansing.

Other objects and advantages of the invention would become apparent from the following detailed description when read in conjunction with the accompanying drawings in which:

Figure 1 shows somewhat diagrammatically, an axial section through a centrifugal separator embodying the invention, and Figure 2 shows a detail of the discs of the disc pack on a larger scale.

The centrifugal separator shown in Fig. 1 comprises a casing 12 mounted on a rotating spindle 13 and provided with an annular disc pack 11 supported in said casing. Water for cleaning is introduced into the interior of the casing via pipe 14 and is discharged from said casing through peripheral discharge nozzles 15 which are controlled by valves 16 constrained by springs 17 secured to the interior of the casing at 18.

As shown more clearly in Figure 2 the inner peripheries of the discs 21 are turned down as at 22 on a radius 23 being brought close together to provide a restricted inlet 24.

I claim:

1. A centrifugal separator which comprises; a revoluble separator bowl having a plurality of valve-controlled apertures for washing liquid positioned in the periphery thereof; a pack of frusto-conical discs disposed in said bowl in spaced superposed relationship with respect to one another, said discs being formed with center holes therein, and said center holes in said discs being arranged, one above the other, so that a substantially cylindrical space extending axially of said bowl, through said superposed discs, is provided; and means for introducing a washing liquid into said substantially cylindrical space so that said liquid flows downwardly, through said cylindrical space, directly onto the inner edges of said superposed discs; the inner edge portions of each of said discs of said pack of discs, adjacent said cylindrical space extending axially of said bowl, being bent downwardly so that it extends at an acute angle to the adjacent portion of said disc surface, the distance between

terminal edges of said bent-over edge portions of adjacent discs being less than the distance between adjacent discs as they are arranged, one above the other, in said pack, whereby entry of washing liquid into the spaces between said superposed discs, at the terminal edges of said bent-over edge portions defining said substantially cylindrical space, is baffled and restricted.

2. A centrifugal separator which comprises; a revoluble separator bowl having a plurality of valve-controlled apertures for washing liquid positioned in the periphery thereof; a pack of frusto-conical discs disposed in said bowl in spaced superposed relationship with respect to one another, said discs being formed with center holes therein, and said center holes in said discs being arranged, one above the other, so that a substantially cylindrical space extending axially of said bowl, through said superposed discs, is provided; and means for introducing a washing liquid into said substantially cylindrical space so that said liquid flows downwardly, through said cylindrical space, directly onto the inner edges of said superposed discs; the inner edge portions of each of said discs of said pack of discs, adjacent said cylindrical space extending axially of said bowl, being bent downwardly to provide a bent-over portion connected to the main portion of said disc by means of a curved portion, said bent-over portion extending at an acute angle with respect to the main portion of said disc surface, the distance between terminal edges of said bent-over edge portions of adjacent discs being less than the distance between adjacent discs as they are arranged, one above the other, in said pack, whereby entry of washing liquid into the spaces between said superposed discs, at the terminal edges of said bent-over portions defining said substantially cylindrical space, is baffled and restricted.

HAROLD WILLIAM FAWCETT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
528,690	Ponten et al.	Nov. 6, 1894
622,393	Reid	Apr. 4, 1899
775,487	Arend	Nov. 22, 1904
2,173,580	Fawcett	Sept. 19, 1939
2,173,581	Fawcett	Sept. 19, 1939

FOREIGN PATENTS

Number	Country	Date
111,796	Germany	July 17, 1900
178,098	Germany	Nov. 24, 1906
76,123	Sweden	Jan. 26, 1929