July 14, 1925.

1,545,832

A. HOFFBAUER

CENTRIFUGAL SEPARATOR

Filed Aug. 14, 1920

Fig. 1,

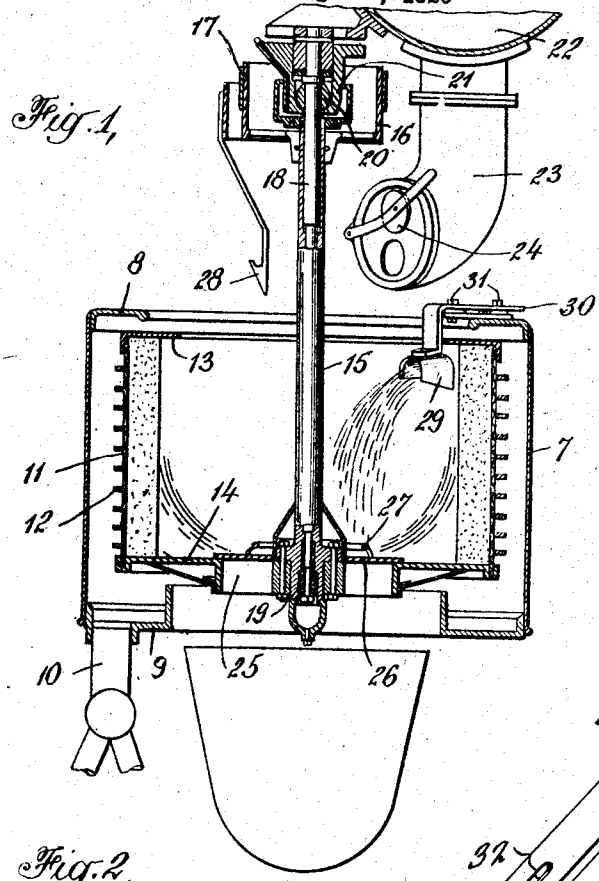


Fig. 2,

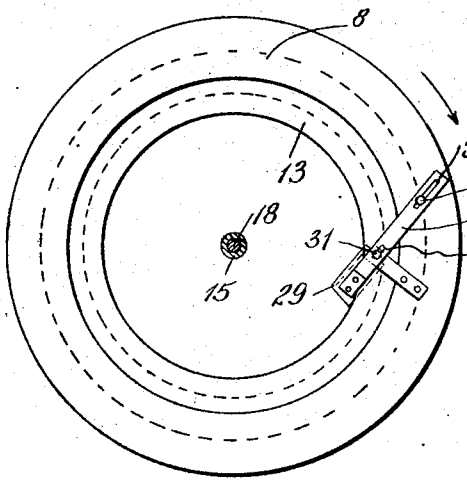
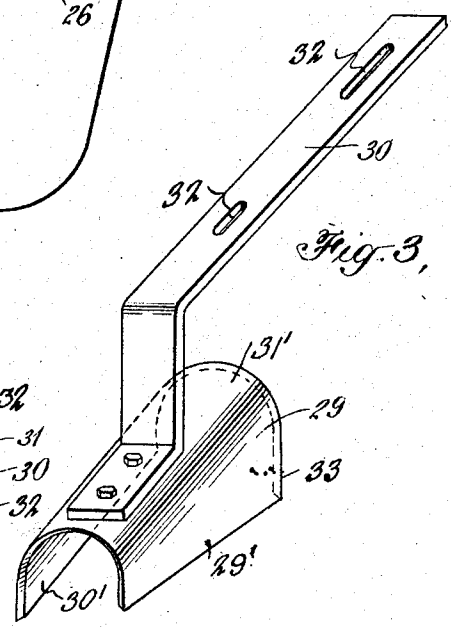


Fig. 3,



Inventor

Alfred Hoffbauer

By his Attorneys

Pennie Davis Marvin & Edmonds

Patented July 14, 1925. 1,545,832

UNITED STATES PATENT OFFICE.

ALFRED HOFFBAUER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE AMERICAN SUGAR REFINING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CENTRIFUGAL SEPARATOR.

Application filed August 14, 1920. Serial No. 403,595.

To all whom it may concern:

Be it known that I, ALFRED HOFFBAUER, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Centrifugal Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to centrifugal separators such as are used to separate liquids from solids by the application of centrifugal force. In the following description reference is made, by way of example, to the use of a centrifugal separator in the treatment of sugar, but it should be understood that the invention is not limited to such use, and has in fact, a general application to centrifugal separators regardless of the character of the materials treated therein.

The separation of syrup from the sugar is accomplished by depositing the mass of syrup and sugar in a foraminous basket which is rotated at high speed, whereby the sugar is thrown against the perforated walls, through which the syrup passes into a surrounding casing from which it is withdrawn. After being washed by a spray of water to remove traces of the syrup remaining, the sugar is delivered from the basket through an opening in the bottom, which is normally closed by a removable cover.

The mass of syrup and sugar is delivered to the basket of the centrifugal from a suitable receptacle through a discharge outlet, controlled by a manually operable closure which is manipulated by the operator to charge the basket at each successive operation. The maximum quantity of the sugar mass which the basket is capable of successfully handling, is more or less definitely limited, and through inadvertence or carelessness the operator frequently permits the delivery of too large a quantity of the mass to the basket. In this event, it is not unusual for the sugar, under the influence of centrifugal force, to climb over the upper edge of the basket and to escape with the separated syrup from the outer casing. Of course the escape of sugar in this manner seriously affects the efficiency of the separation, and the sugar must be recovered from the syrup by further treatment, entailing additional operations and cost.

It is the object of the invention to overcome the disadvantages and losses occasioned by the escape of sugar from the basket of the centrifugal separator, by the provision of a device adapted to prevent the sugar from rising over the edge of the basket, and to deflect the sugar which tends to rise above the upper edge of the basket inwardly and downwardly to the centre of the basket.

Further objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing, in which—

Fig. 1 is a vertical section through a centrifugal separator embodying the invention.

Fig. 2 is a plan section of the centrifugal, and

Fig. 3 is a view in perspective of the deflector.

It is to be understood that the centrifugal separator, illustrated by way of example in the accompanying drawing, may be varied in detail, and that the invention is applicable to this and other forms of centrifugal separators in which the difficulty hereinbefore mentioned is experienced. The invention involves the arrangement of a deflector in adjustable relation to the upper edge of the revolving basket, with an edge so disposed as to intercept any sugar tending to rise above a given level and shaped to direct this sugar inwardly and downwardly toward the center of the basket, whence it is again thrown outwardly by centrifugal force against the wall of the basket. Obviously the bulk of the sugar mass, when first delivered to the basket, exceeds considerably that of the separated sugar. Consequently, if the sugar first tends to creep over the edge of the basket and is returned thereto in the manner explained, it will eventually lodge against the wall of the basket, and owing to the decreased bulk, the operation may be completed without removing any of the surplus sugar from the basket.

Referring to the drawing, 7 indicates the casing of the centrifugal separator. The top of the casing is partially closed by an annulus 8 forming a shelf extending inwardly from the cylindrical wall 7 a short distance. The bottom of the casing is parti-

ally closed by an annulus 9 in which is an outlet 10 for the syrup. The outlet 10 of the conduit leading therefrom may be provided with a syrup separator, as is indicated diagrammatically in Fig. 1, which permits of segregating two or more different grades or qualities of syrup.

Within the casing is the rotary basket consisting of a cylindrical screen 11 sustained by rings 12. At the top of the basket is a flange 13 extending inwardly from the cylindrical wall a short distance. The bottom 14 of the basket is secured to a hollow shaft 15 extending upwardly a substantial distance above the basket and carrying a pulley 16 on which a belt 17 runs to transmit rotary motion at high speed to the basket. The basket is mounted upon a shaft 18 extending through the hollow shaft 15 and having a bearing 19 at its lower end upon which the weight of the basket and the parts rotating therewith is received. Secured to the shaft 18 near its upper end is a spherical member 20 which is received in a bearing 21 suspended in any suitable manner from the overlying structure. The sugar mass is admitted to the basket from a suitable receptacle 22 through a discharge outlet 23 provided with a closure 24. In the bottom of the basket is an annular opening 25 through which the sugar passes out of the basket. This opening is adapted to be closed by a cover 26 consisting of an annular plate adapted to rest upon the upper surface of the bottom plate 14 of the basket. On this cover 26 is an annular flange 27. Above the basket is a hook 28 extending downwardly from the supporting structure, the arrangement being such that the cover 26 may be lifted from its closed position upwardly out of the basket and suspended from the hook 28 by engaging the flange 27 over the hook. The usual plow or scraper supported for vertical movement within the basket in close relation with the walls thereof may be provided to remove the caked sugar therefrom at the conclusion of the separation. This plow is particularly to be distinguished from the present invention since its function is entirely distinct. The plow is movable for the purpose of scraping the walls of the basket, and is only used at the conclusion of the separation, whereas the deflector hereinafter described and claimed remains stationary in adjusted position and deflects the sugar tending to climb over the edge of the basket during the separating operation.

This deflector 29 is supported on a bar 30 which is in turn secured, by bolts 31, for example, to the annulus 8. The bar 30 may be provided with slots 32 to permit adjustment when the bolts are loosened. The deflector 29 consists of two blades 29′ and 30′ spaced apart and connected by a web 31′ and is shaped to direct the sugar inwardly and downwardly. It is provided with an edge 33 which is adjusted in spaced relation with the wall of the basket slightly below the flange 13 thereon. As the basket rotates, the sugar is forced against the screen, and any surplus tends to climb over the upper edge of the basket. This surplus is promptly caught by the deflector and returned to the basket.

From the foregoing explanation, it will be understood that the introduction of the deflector in a centrifugal separator ensures a material saving for the reason that all of the sugar which is delivered to the basket is retained therein. The separation efficiency of the centrifugal is increased and the escape of crystallized sugar in the syrup is avoided. The device is extremely simple in construction; it does not interfere with the usual mode of operation of the centrifugal, and it accomplishes a new and particularly useful result in centrifugal separation.

Various changes may obviously be made in the detail of form and arrangement of the parts without departing from the invention or sacrificing any of the advantages hereinbefore set forth.

I claim:

1. In a centrifugal separator the combination of a foraminous basket, means for rotating the basket, a casing surrounding the basket, means for delivering material to be separated to the basket and means associated with the basket and having spaced blades one to gather and the other to deflect material tending to climb over the upper edge during rotation thereof inwardly and downwardly therein the blades being connected by a web with their free edges downwardly directed.

2. In a centrifugal separator the combination of a foraminous basket, means for rotating the basket, a casing surrounding the basket, means for delivering material to be separated to the basket and a deflector associated with the basket and having spaced blades one to gather and the other to deflect surplus material tending to climb over the upper edge during rotation thereof, the blades being connected by a web with their free edges downwardly directed.

3. In a centrifugal separator the combination of a foraminous basket, means for rotating the basket, a casing surrounding the basket, means for delivering material to be separated to the basket, a deflector associated with the basket and having spaced blades, one to gather and the other to deflect surplus material tending to climb over the upper edge during rotation thereof, the blades being connected by a web with their free edges downwardly directed and means for adjustably supporting the deflector.

4. In a centrifugal separator the combination of a foraminous basket, means for

rotating the basket, a casing surrounding the basket, means for delivering material to be separated to the basket, a support on the casing and an inverted U-shaped deflector held on the support in spaced relation with the upper edge of the basket.

5. In a centrifugal separator the combination of a foraminous basket, a casing surrounding the basket, means for rotating the basket, means for delivering material to be separated to the basket, an adjustable support on the casing and an inverted U-shaped deflector held on the support in spaced relation with the upper edge of the basket.

In testimony whereof I affix my signature.

ALFRED HOFFBAUER.