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2,022,114

CENTRIFUGAL DRYING MACHINE

Filed Aug. 10, 1934

3 Sheets-Sheet 1

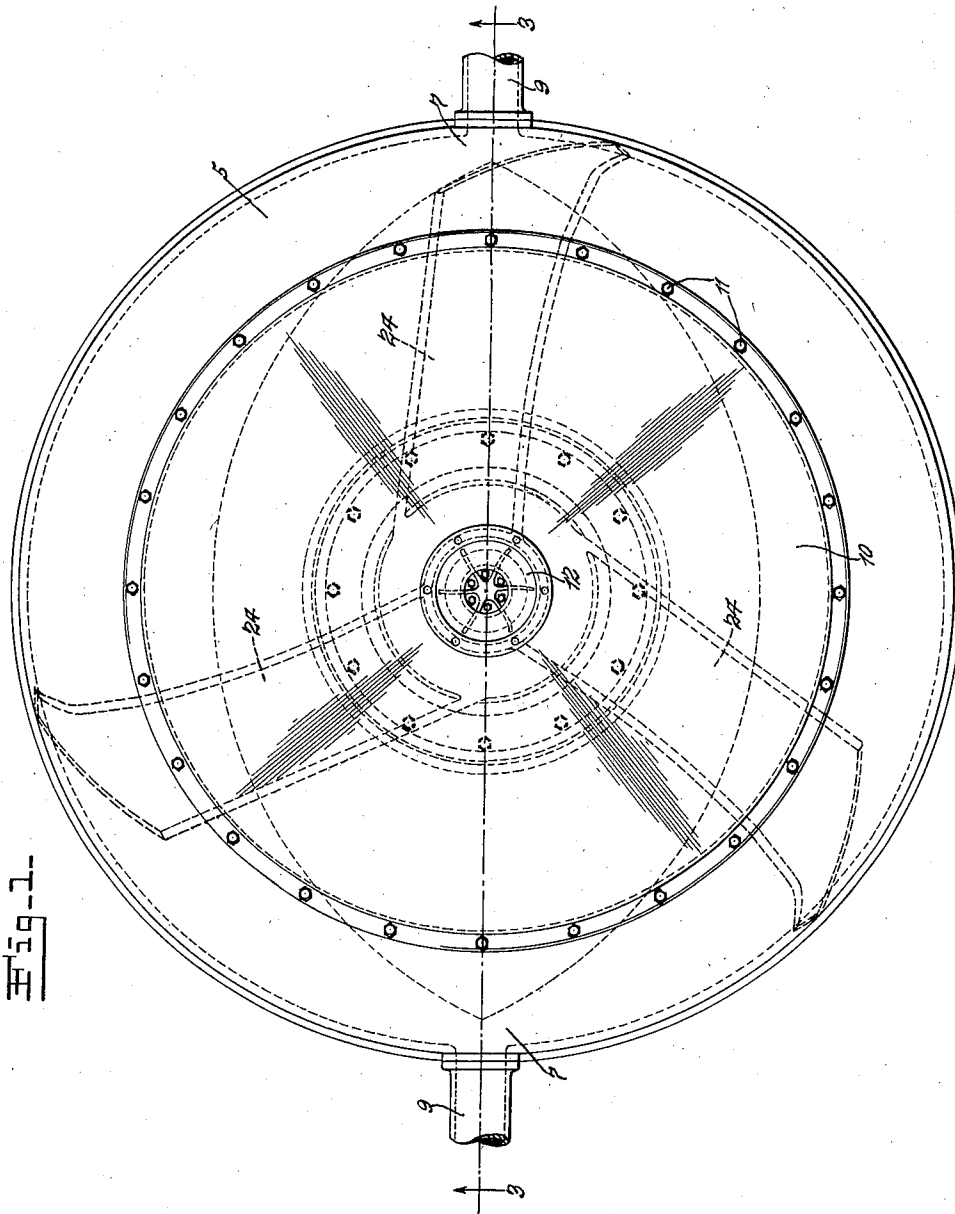


Fig. 1-

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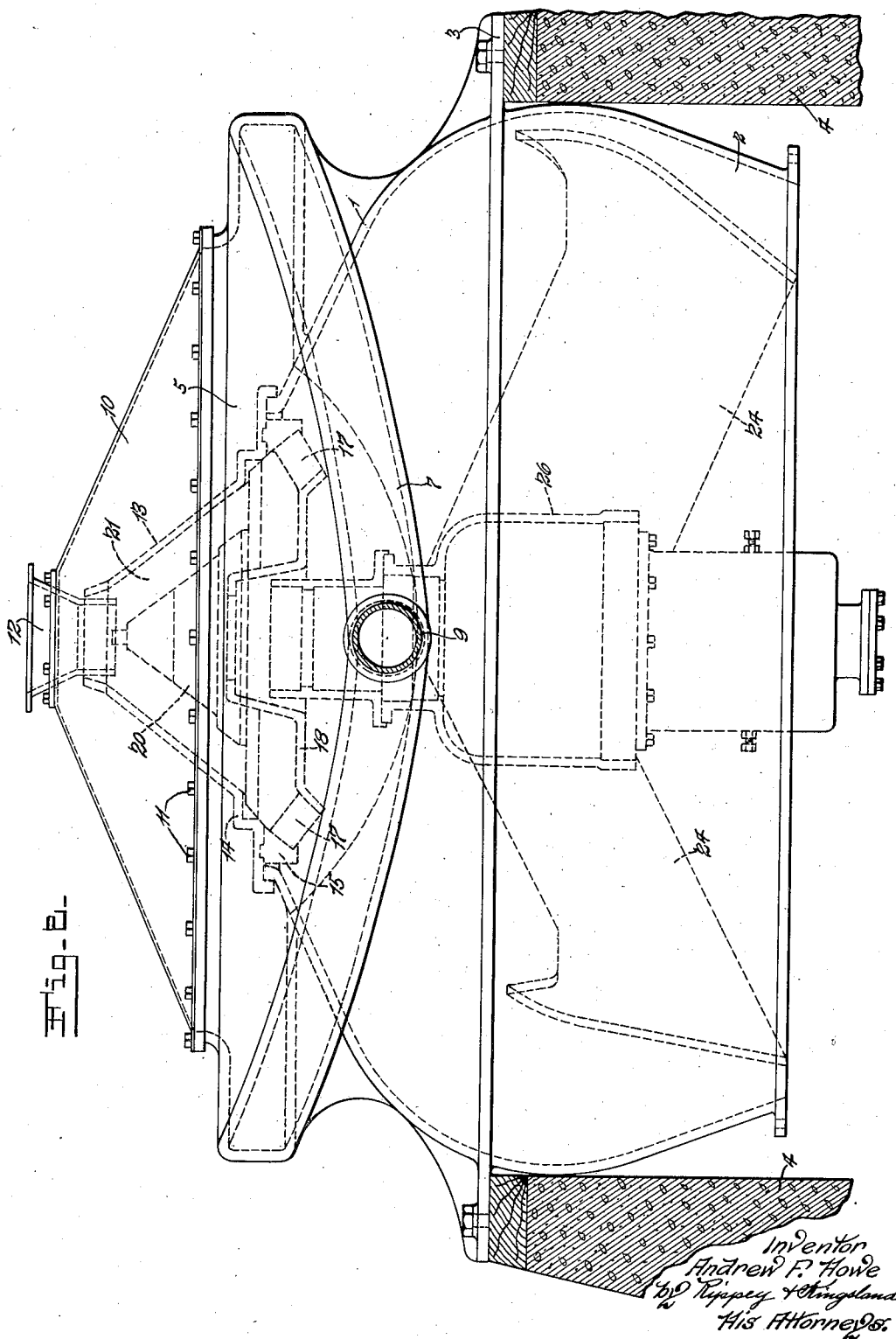
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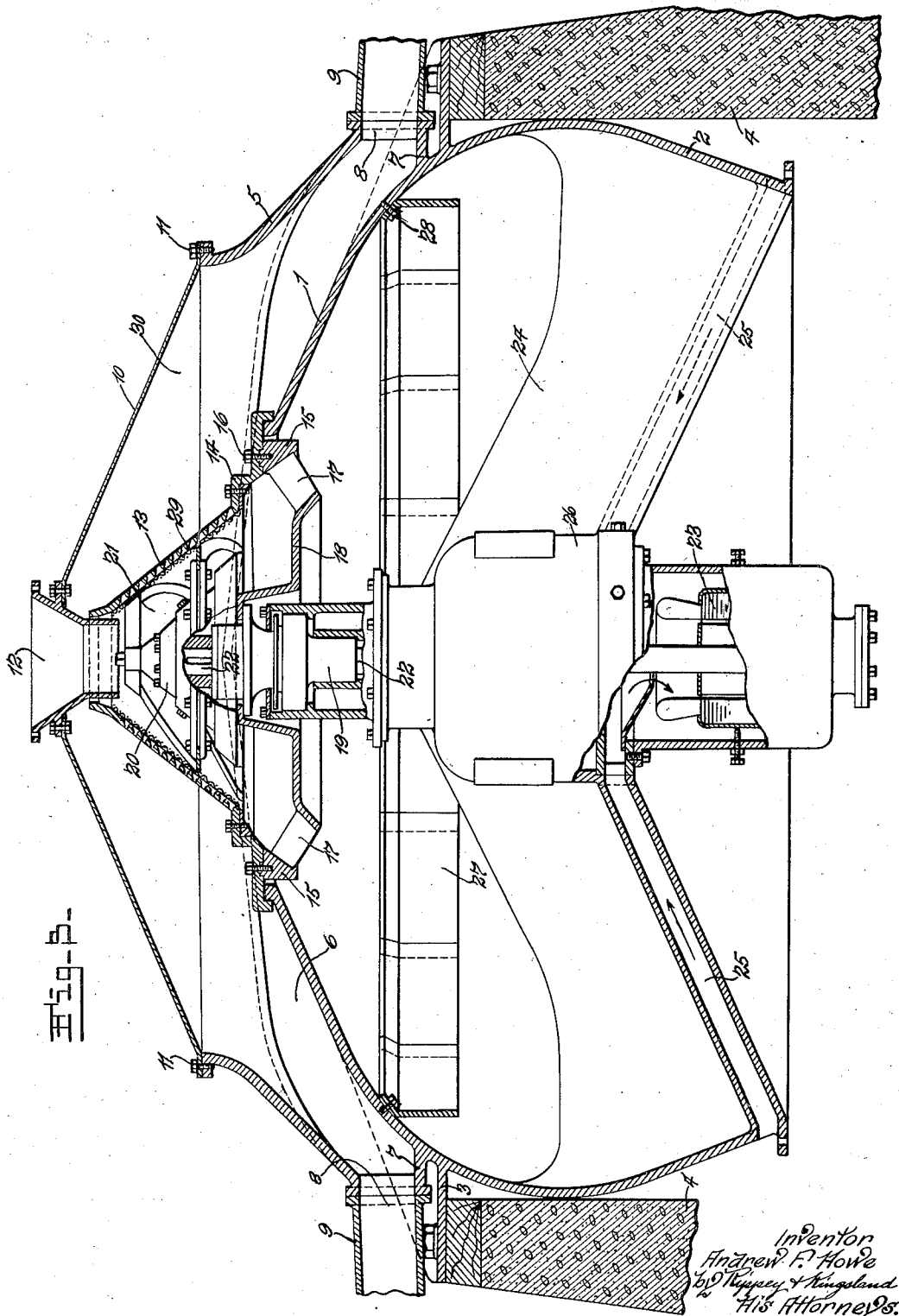
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

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CENTRIFUGAL DRYING MACHINE

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Application August 10, 1934, Serial No. 739,236

9 Claims. (Cl. 210-69)

This invention relates to centrifugal drying machines.

Objects of the invention are to provide an improved centrifugal drying machine including a rigid relatively large housing provided with rigid supports for supporting the centrifugal drying mechanism; to provide at the upper side of said housing centrifugal drying mechanism comprising a rotary distributing cone, in combination with a rotary screen surrounding and separated from said cone by an intervening space having an inlet passage at the upper end of said screen and discharge outlets at the lower end of said screen opening into said housing; to provide within said housing below said outlets an elastic wall against which the materials from said outlets are discharged to prevent said materials from being thrown against the rigid wall of said housing and thereby broken or shattered or otherwise damaged; to provide means for supporting motor mechanism in said housing for rotating said cone and said screen; and to provide means for conducting air from the outlets of said housing to said motor mechanism through passages provided for that purpose.

Various other objects and advantages of this invention will be apparent from the following description, reference being made to the annexed drawings, in which—

Fig. 1 is a top plan view of my improved centrifugal drying machine.

Fig. 2 is a side elevation of said machine.

Fig. 3 is a vertical diametrical sectional view of the housing of my improved centrifugal drying machine approximately on the line 3-3 of Fig. 1.

The housing of my improved centrifugal drying machine is approximately in the form of a dome and comprises a dome-like wall 1 having its lower marginal portion 2 curving inwardly. A circumferential flange 3 formed integral with the housing extends outwardly and is attached to a supporting wall structure 4. A wall 5 has its lower edge formed integral with portion 1 of the dome, and said wall 5 extends upwardly around the portion 1 and is separated therefrom by an intervening space 6. Diametrically opposite portions 7 of the wall structure 5 dip downwardly, as should be understood by reference to Fig. 2, and the space 6 is provided with outlet openings 8 at the lowest points of the wall structure 7. Pipes 9 are attached to the wall structure 7 around the openings 8 and function to carry off water and other liquids discharged into the space 6 by operation of the centrifugal drying mechanism. A conical wall 10 has its lower margin attached to

the upper margin of the wall 5 by fasteners 11, and a hopper 12 attached to the apex of the wall 10 forms a passage for conducting to the drying mechanism the materials to be dried.

A rotary conical screen 13 has an opening through its apex, and the lower end of the hopper 12 extends through said opening into the upper portion of the space enclosed by said screen. The lower edge of the screen 13 is attached to an annular frame member 14 which is fastened to a ring 15 by screws 16. Spaced webs 17 are rigid with the ring 15 and with a rotary annular member 18 attached to the upper end of a tubular shaft 19. A distributing cone 20 is enclosed within the screen 13 and separated therefrom by an intervening space 21. The apex of the cone 20 is approximately concentric with the lower end of the passage through the hopper 12, so that materials discharged into the space 21 from said hopper will be discharged entirely about or around the upper end of the distributing cone.

The distributing cone 20 is attached to the upper end of a shaft 22 which extends concentrically into the tubular shaft 19. Said shafts 19 and 22 are rotated in the same direction and at the same time and at the same or different speeds, as desired, by known types of gearing operated by a motor 23. In my companion applications Serial Nos. 729,234 and 729,235 filed concurrently herewith, types of gearings for rotating these shafts are disclosed. For present purposes, it may be assumed that either of said gearings, or any other appropriate type of gearing, may be used for rotating the shafts 19 and 22 simultaneously and in the same direction and at the same speed or at speeds wherein the screen 13 is rotated slower than the cone 20.

A series of inclined webs 24 have their outer ends integral with the housing portion 2 and their inner ends supporting the frame for the motor 23. These webs 24 are widely spaced (Fig. 1) and they incline upwardly in a direction opposite to the direction of rotation of the centrifugal drying mechanism comprising the screen 13 and the distributing cone 20, so that they do not present wide surfaces toward the material discharged from the drying mechanism. The lower edges of the webs 24 have passages 25 therethrough opening into the housing 26 to supply air to the motor 23.

An annular elastic wall 27 of rubber or other suitable elastic material is attached to the inside of the housing portion 1 by removable and replaceable fasteners 28 in the general line of discharge of the dried material from the drying mechanism. This elastic wall stops the centrifugal

gal movement of the dried material and prevents said material from striking against the metallic wall 1 and being thereby broken or crushed or otherwise damaged. When the dried material, which may be fibrous or granular or of other form, is thrown against the elastic wall 27, the outward movement of said material is thereby stopped, and the material is caused to drop by gravity.

In operation, electrical energy is supplied to the motor 23, thereby rotating the screen 13 and the distributing cone 20 at the desired speed while material is conducted into the space 21 through the hopper 12. The rapid rotation of the distributing cone 20 throws the material against the screen 13 and said material continues to move downwardly through the space 21, the flexible member 29 bending and permitting the material to continue to move downwardly. The centrifugal operation causes water and other liquid to pass through the screen 13 into the space 30 within the conical wall 10 and thence into the space 6 and downwardly to the openings 8 and out through the pipes 9. The material is thrown outwardly against the elastic wall 27, the outward movement of the material being thereby stopped, and the material is caused to drop downwardly between and across the webs 24. Air is continuously supplied to the motor 23 through the passages 25.

As shown, the dome device 1 is of relatively large size or diameter, so that there is sufficient room or distance to be traversed by the material discharged centrifugally from the space 21 for the momentum or speed of travel of said material to be considerably diminished before the material strikes against the elastic wall 27. The elastic wall 27 is supported at relatively a considerable distance from the discharge end of the space 21. The construction and arrangement of my improved centrifugal drying machine may be varied as widely as the scope of equivalents will permit without departure from the nature and principle of the invention. I do not otherwise restrict myself.

I claim:—

1. A centrifugal drying machine comprising a housing of relatively large diameter, rotary screen and distributing cone members separated by an intervening space that opens into said housing at relatively a considerable distance from the wall of said housing and through which space the dried material passes into said housing, mechanism for rotating said members, and an elastic wall supported in said housing a considerable distance from said members and in the line of movement of said material.

2. A centrifugal drying machine comprising a rigid housing of relatively large diameter, rotary screen and distributing cone elements separated by an intervening space that opens into said housing at relatively a considerable distance from the wall of said housing and through which space the dried material passes into said housing, webs rigid with said housing, a motor housing supported by said webs, a motor mounted in said motor housing for rotating said screen and distributing cone elements, and means supported by said webs forming passages for admitting air into said motor housing.

3. A centrifugal drying machine comprising a rigid housing, rotary screen and distributing cone elements separated by an intervening space that opens into said housing and through which space the dried material passes into said housing at a

considerable distance from the wall of said housing to reduce the speed of travel of said material, webs rigid with said housing, a motor housing supported by said webs, a motor mounted in said motor housing for rotating said screen and distributing cone elements, means supported by said webs forming passages for admitting air into said motor housing, and an elastic curtain wall supported in said rigid housing above said webs in the path of the material passing from said space between said screen and distributing cone elements.

4. A centrifugal drying machine comprising a rigid housing, rotary screen and distributing cone elements separated by an intervening space that opens into said housing and through which space the dried material passes into said housing at a considerable distance from the wall of said housing to reduce the speed of travel of said material, webs rigid with said housing, a motor housing supported by said webs, a motor mounted in said motor housing for rotating said screen and distributing cone elements, means supported by said webs forming passages for admitting air into said motor housing, and means forming a confined space around the upper portion of said rigid housing receiving liquid discharged through said screen.

5. A centrifugal drying machine comprising a rigid dome-shaped housing, centrifugal drying mechanism operative to discharge dried material into said housing, and an elastic curtain wall supported in said housing in the line of movement of the dried material passing from said drying mechanism and at sufficient distance from said mechanism to reduce the speed of travel of said material before said material strikes said elastic curtain.

6. A centrifugal drying machine comprising a rigid dome-shaped housing, centrifugal drying mechanism operative to discharge dried material into said housing, an elastic curtain wall supported in said housing in the line of movement of the dried material passing from said drying mechanism and at sufficient distance from said mechanism to reduce the speed of travel of said material before said material strikes said elastic curtain, and a motor supported in said housing for operating said drying mechanism.

7. A centrifugal drying machine comprising a rigid dome-shaped housing, centrifugal drying mechanism operative to discharge dried material into said housing, an elastic curtain wall supported in said housing in the line of movement of the dried material passing from said drying mechanism and at sufficient distance from said mechanism to reduce the speed of travel of said material before said material strikes said elastic curtain, a motor supported in said housing for operating said drying mechanism, and means forming passages for conducting air to said motor.

8. A centrifugal drying machine comprising a dome-like rigid housing, centrifugal screen and cone elements, mechanism for rotating said screen and cone elements to dry material between them and to discharge the material into said housing, and an elastic curtain wall supported in said housing in the line of movement of the dried material passing from said screen and cone elements and at sufficient distance from said mechanism to reduce the speed of travel of said material before said material strikes said elastic curtain.

9. A centrifugal drying machine comprising a dome-like rigid housing, centrifugal screen and

5 cone elements, mechanism for rotating said screen and cone elements to dry material between them and to discharge the material into said housing, an elastic curtain wall supported in said housing in the line of movement of the dried material passing from said screen and cone elements and at sufficient distance from said mech-

anism to reduce the speed of travel of said material before said material strikes said elastic curtain, webs rigid with said housing and extending inwardly therefrom, and air passages supported by said webs for conducting air to said mechanism. 5

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