A. D. ROBINSON.

DESICCATING APPARATUS.

APPLICATION FILED JUNE 26, 1919.

1,389,597.

Patented Sept. 6, 1921.

2 SHEETS—SHEET 1.

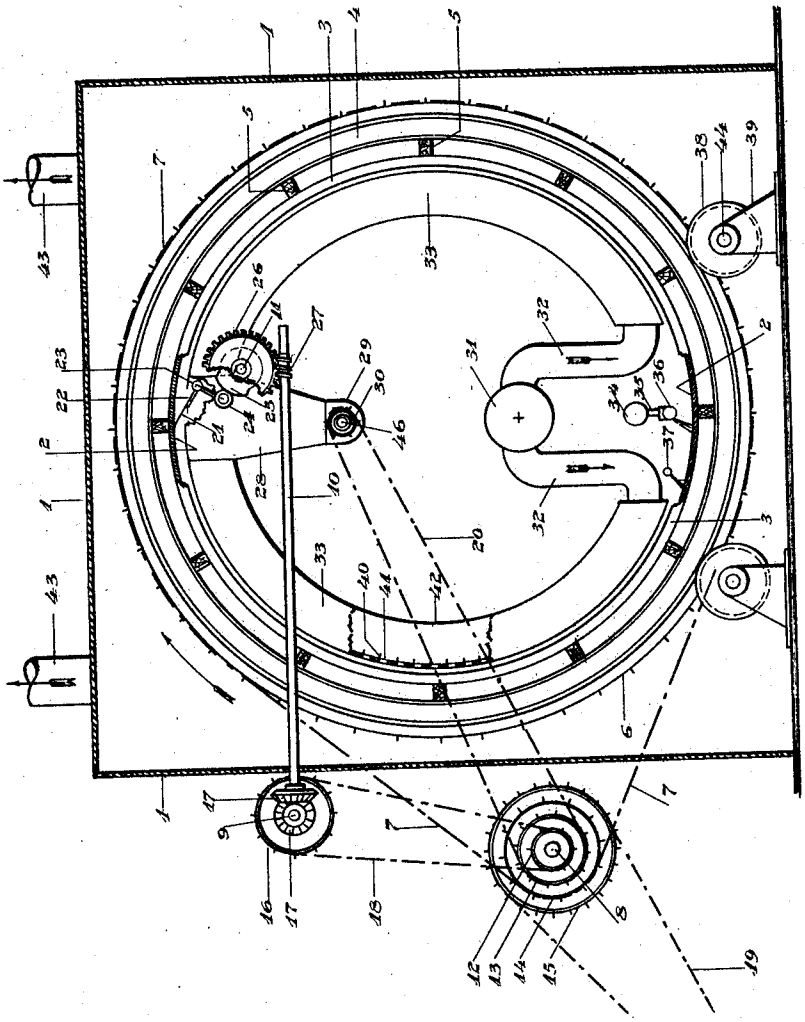


FIG. 1.

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2 SHEETS—SHEET 2.

FIG. 4.

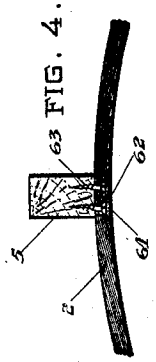


FIG. 5.

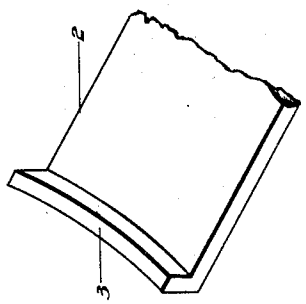


FIG. 3.

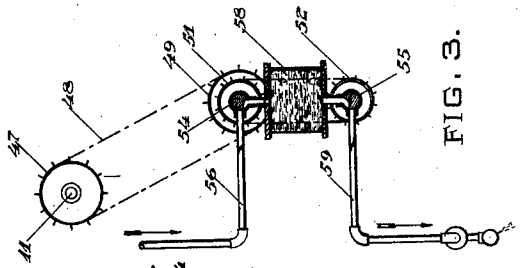
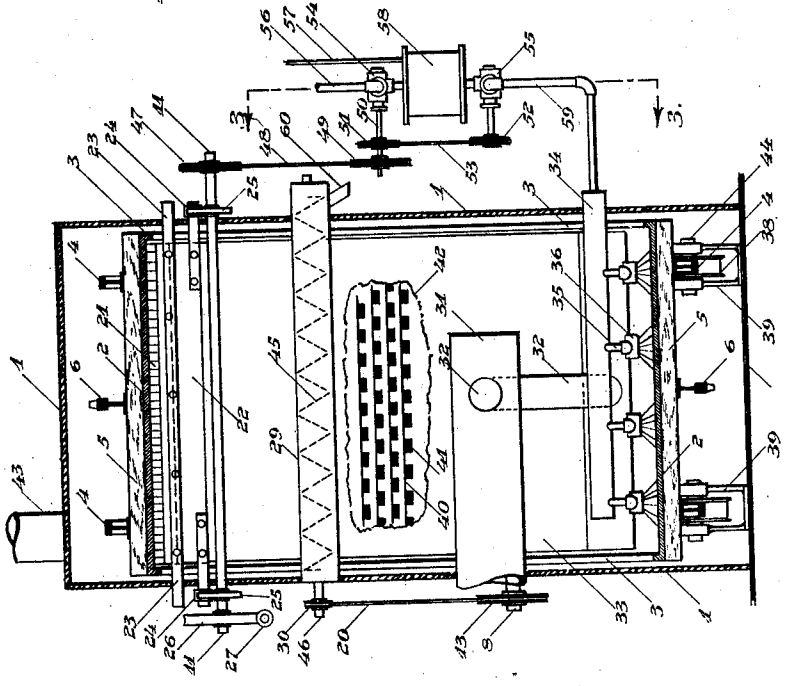


FIG. 2.



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UNITED STATES PATENT OFFICE.

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DESICCATING APPARATUS.

1,389,597. Specification of Letters Patent. Patented Sept. 6, 1921.

Application filed June 26, 1919. Serial No. 306,983.

To all whom it may concern:

Be it known that I, ARTHUR D. ROBINSON, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Desiccating Apparatus, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to desiccating apparatus, and especially to desiccating apparatus for drying eggs and similar substance which are applied to the apparatus while in a batter condition. My invention relates particularly to a machine whereby eggs and similar substance may be easily and quickly dried, and which will be automatic in its operation of supplying the material to the machine before being dried and in removing the material from the machine after it is dried.

The object of my invention is to provide a simple, automatic machine for drying eggs and similar substances; and a further object of my invention is to provide a desiccating apparatus wherein the surface to which is applied the material to be dried is formed of slate or similar non-metallic substance.

My invention is fully shown in the accompanying drawings where similar reference numerals are used to designate similar parts. Figure 1 is a vertical view of an apparatus embodying my invention in which a part of the casing is removed so as to show the internal arrangement of the parts; Fig. 2 is a view of a vertical section at right angles to the plane of the view in Fig. 1; Figs. 3, 4 and 5 show views of parts of the apparatus enlarged and in detail.

Referring to the figures, 1 is a casing inside of which is rotatably mounted an open ended drum having an inner lining or circumferential surface 2 which extends axially of the drum, and which is provided at its ends with inwardly projecting flanges 3. The lining 2 is mounted inside of the circular tracks 4 on stringers 5 which extend axially of the drum. The lining is preferably made of slate and formed of a plurality of pieces which meet so as to form substantially tight joints on the stringers 5 to which the pieces of slate are attached by means of screws 63 as shown in Fig. 4. The flange 3 is preferably formed integral with the pieces of slate as shown in Fig. 5 and, where necessary, the joint between adjacent pieces of slate is filled with a cement 62. This joint is, however, made as small as possible and the edges of the meeting pieces of slate are smoothed off so as to form a smooth, even interior surface on the lining 2, as it is to this surface that the material to be dried is applied. The drum is placed in the casing 1 with the tracks 4 resting on the rollers 38, of which there are four. These rollers are carried in supports 39 on axles 44. 6 is a sprocket wheel which surrounds the stringers 5 and which is preferably placed midway between the tracks 4. The sprocket wheel 6 is connected by means of a chain 7 to the sprocket wheel 14 on the drive shaft 8. The shaft 8 is provided with a sprocket wheel 15 which is connected by means of a suitable chain 19 to a motor which is not shown on the drawings. 9 is a shaft carried in suitable bearings, not shown, and which is provided with a sprocket wheel 16 which is connected by means of the chain 18 to the sprocket wheel 12 on the shaft 8. 17, 17 are engaging miter-wheels which are mounted one on the shaft 9 and the other on the shaft 10 which has at its farther end a worm 27 which drives a worm wheel 26 on the shaft 11. 13 is a sprocket wheel mounted on the shaft 8 and connected by means of the belt 20 to the sprocket wheel 30 on the shaft 46. The shaft 46 extends through a casing 29 and operates a conveyer 45. The casing 29 forms the bottom portion of the receiver 28 which is closed at the ends but which is open at its upper end which is adjacent to the highest point of the inner surface of the lining 2. The shaft 11 has mounted upon it cams 25 which contact with the rollers 24 which are attached to the oscillating shaft 23 by means of the angular member 22. Attached to one angle of the member 22 there is the scraper 21 which is preferably made of a plurality of steel fingers, as shown in Fig. 2. When the shaft 11 is turned by means of the worm wheel 26 and the worm 27, so that the cams 25 are in contact with the rollers 24, as shown in Fig. 1, the scraper 21 is pressed against the inner surface of the lining 2, and when the drum is made to revolve by means of the sprocket chain 7 in the direction shown in Fig. 1 by the arrow, the dried material will be scraped from the inner surface by the scraper 21. The material scraped from the inner surface will fall in the receiver 28 and from there into the

casing 29 through which it will be moved by the conveyer 45 and discharged outside of the casing 1 through the discharge pipe 60. The shaft 11 has mounted upon it the sprocket wheel 47 which is connected by means of the chain 48 to the sprocket wheel 49 on the stem 50 of the valve 54. The valve 54 is for controlling the flow, while in a batter condition, of the material to be dried through the pipe 56 which connects the source of supply of batter to the auxiliary tank 58. This auxiliary tank is provided with a vent pipe 57. The valve stem 50 has mounted upon it a sprocket wheel 51 which is connected to the sprocket wheel 52 on the stem of the valve 55, by means of the chain 53. The valve 55 controls the flow of the material to be dried, from the auxiliary tank 58, through the pipe 59 to the header 34. From the header 34 the material passes through the pipes 35 and the delivery heads 36 onto the interior surface of the lining 2. The heads 36 are preferably placed close to the lowest point of the interior surface of the lining. 37 is a spreader which extends axially of the drum and spreads the material uniformly over the interior surface of the lining 2. The valves 54 and 55 are, preferably, made as shown in Fig. 3, and they are adjusted to move with respect to one another in such a way that when the valve 54 is open to allow material to flow into the auxiliary tank 58, the valve 55 is closed; and, vice versa, when the valve 55 is open to allow the flow of material from the tank 58 onto the interior surface of the drum, the valve 54 is closed. These valves, 54 and 55, are shown in section in Fig. 3 with the pipes immediately adjacent to them broken away. The cams 25 on the shaft 11 are so adjusted that when batter is being applied to the interior surface of the lining 2, the roller 14 is out of contact therewith and the scraper 21 is not contacting with the interior surface of the lining 2. The cam 25 begins to contact with the roller 24 at such a time after the valve 55 has closed as will have allowed the material applied to the inner surface of the drum to become dry, and when the cam 25 contacts with the roller 24 the scraper 21 is pressed against the inner surface of the lining and the dried material is removed therefrom and allowed to drop into the receiver 28 from which it is removed to the outside of the casing 1 by the conveyer 45 as has already been described. It is evident that by using positive connectors such as sprocket wheels, chains and gear wheels to connect the various parts to one another and to the main drive shaft 8, when the action of one part relative to another is once adjusted this adjustment will continue forever. It is also evident that by the mechanism already described the material to be dried is automatically applied to the interior surface of the lining at predetermined intervals, and is also automatically removed therefrom and discharged outside of the casing.

In order to facilitate the drying of the material I supply hot air to the interior of the drum by means of a main supply pipe 31 which is connected by means of the auxiliary pipes 32 to the arcuate distributers 33 which have one face, that is adjacent to the inner surface of the lining 2, provided with apertures 41 through which the air flows onto the inner surface of the lining 2. The apertures 41 are, preferably, made elongated and arranged in rows so that the apertures of one row alternate with those of adjacent rows, and so that, also, the space between the adjacent apertures is not substantially less than the length of the apertures. The apertures are also preferably provided with deflectors 40 which are arranged so that one deflector serves for a row of apertures. The arrangement of the apertures and deflectors are shown in Figs. 1 and 2 where a part 42 of the sides of a distributer 33 is shown removed. The air after having done its work passes out from the casing through the vents 43.

I prefer to make the lining 2 of slate because I have found that a slate lining is better than either a wood or a metal lining since the surface of the slate lining is not acted upon by the atmosphere nor by the ingredients of egg batter or similar material; and further, the slate lining is more easily cleaned than either wood or metal and it is also more sanitary. I find also that egg batter adheres more readily to the surface of a slate lining than it does to a metal surface.

The flange 3 prevents any of the batter from flowing over the ends of the lining 2, and when this flange is made integral with the pieces of slate used in the formation of the lining 2 there is no chance for the accumulation of material between the base of the flange and the edge of the lining 2 as there would be if the flange were not made integral with the lining. I prefer to make the joint between the adjacent pieces of slate used in the construction of the lining 2 a ground and fitted joint which will be tight without the use of any cement filling, but where necessary I use a filling 62 as shown in Fig. 4. The screws 63 are countersunk as shown in Fig. 4 and the holes above the heads thereof are filled with cement as shown at 61. The batter may be supplied to the drum under pressure by placing the source of supply a suitable distance above the nozzles 36 and by extending the vent pipe to the same height above the nozzles.

It is evident that the various parts of the apparatus may be varied to suit various conditions and requirements without in any

way departing from the spirit of my invention, and while I prefer that the lining 2 be made of slate, it is obvious that other material may be used for this lining and many advantages of my desiccating apparatus may be obtained with such other lining.

What I claim as new and desire to secure by Letters Patent, is:

1. A desiccating apparatus for eggs and the like comprising a casing, an open ended drum rotatably mounted in said casing and having an interior lining formed of pieces of slate joined so as to present an imperforate smooth interior surface, means whereby the material to be dried is supplied in a batter condition to said imperforate surface, a scraper for removing the material when dried from said imperforate surface, pipes for supplying hot air for drying said material, and means whereby said drum is caused to rotate.

2. A desiccating apparatus for eggs and the like comprising a casing, an open ended drum rotatably mounted in said casing and having an interior lining formed of pieces of slate joined together so as to present an imperforate smooth interior surface, said surface being provided with end flanges extending inwardly therefrom, means whereby the material to be dried is applied in a batter condition to said surface, a scraper for removing said material from said surface when dry, pipes for supplying hot air for drying said material, and means whereby said drum is caused to rotate.

3. A desiccating apparatus for eggs and the like comprising a casing, an open ended horizontal drum rotatably mounted therein and having an interior surface adapted to receive in a batter condition the material to be dried, means including an auxiliary tank adapted to contain the quantity of batter for one application for applying at determined intervals a film of batter simultaneously throughout the whole axial length of said surface, a source of supply of batter for said auxiliary tank, a scraper adapted to engage at predetermined intervals the whole axial length of said surface and positioned above the axis of said drum whereby the batter when dry is removed from said surface, pipes whereby hot air is supplied to the interior of said drum, and means whereby said drum is rotated.

4. A desiccating apparatus for eggs and the like comprising a casing, an open ended horizontal drum rotatably mounted therein and having an interior surface adapted to receive in a batter condition the material to be dried, means for applying batter to said surface, said means comprising an auxiliary tank adapted to contain batter for one application to said surface whereby said batter is applied to said surface at predetermined intervals in measured quantities, a scraper whereby dry batter is removed from said apparatus, and means whereby said drum is rotated.

5. A desiccating apparatus for eggs and the like comprising a casing, an open ended drum rotatably mounted therein and having an interior lining formed of pieces of slate joined together so as to present an imperforate smooth interior surface, means including an auxiliary tank adapted to contain the quantity of batter for one application for applying at determined intervals a film of batter simultaneously throughout the whole axial length of said surface, a source of supply of batter for said auxiliary tank, a scraper adapted to engage at predetermined intervals the whole axial length of said surface and positioned above the axis of said drum whereby the batter when dry is removed from said surface, pipes whereby hot air is supplied to the interior of said drum, and means whereby said drum is rotated.

6. A desiccating apparatus for eggs and the like comprising a casing, an open ended horizontal drum rotatably mounted therein and having an interior lining formed of pieces of slate joined together so as to present an imperforate smooth interior surface, said surface being provided with end flanges extending inwardly therefrom, delivery heads whereby batter is applied to said surface, an auxiliary tank connected to said source of supply and to said delivery heads, a valve controlling the flow of batter from said source of supply to said auxiliary tank, a valve controlling the flow of batter from the auxiliary tank to said delivery heads, means whereby said valves are open and closed at predetermined intervals so as to cause a measured quantity of batter to be alternately supplied to and withdrawn from said auxiliary tank, a scraper for removing said material from said surface when dry, pipes for supplying hot air to the interior of said drum, and means whereby said drum is rotated.

In witness whereof I have signed my name to this specification.

ARTHUR D. ROBINSON.