A. V. ALBERTO.

DRIER FOR DEHYDRATING MACARONI AND THE LIKE.

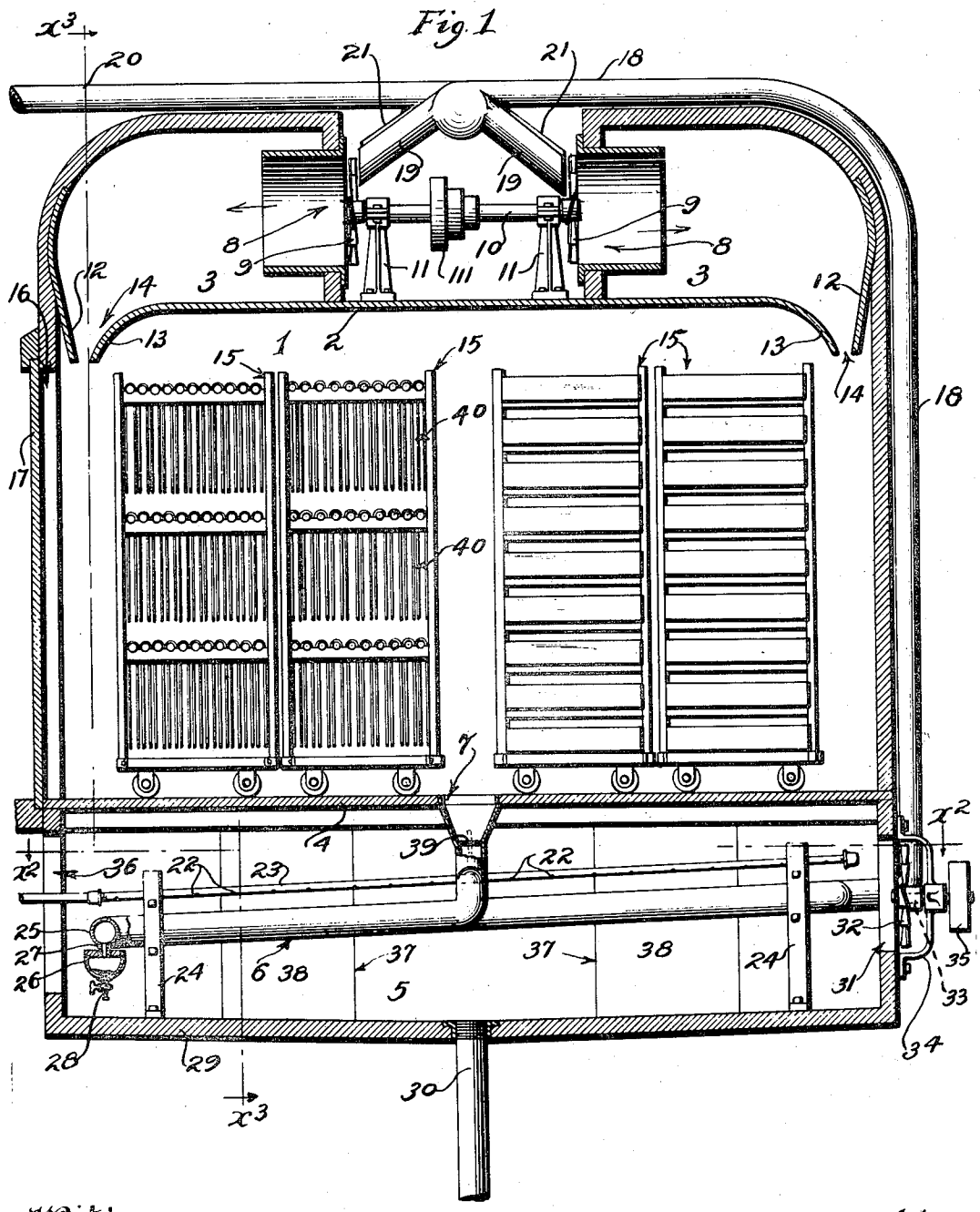
APPLICATION FILED AUG. 31, 1915.

1,185,594.

Patented May 30, 1916.

2 SHEETS--SHEET 1.

Fig. 1



Witnesses:

Fully Fusso.

George H. Hiles

Inventor

Angelo V. Alberto

By Frederick Rhyon Atty

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2 SHEETS—SHEET 2.

Fig. 2

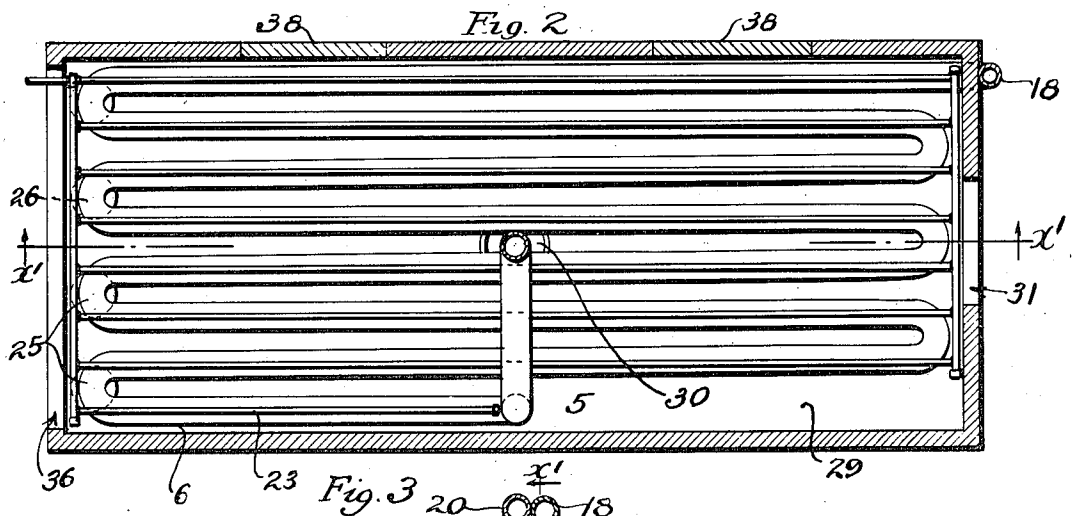
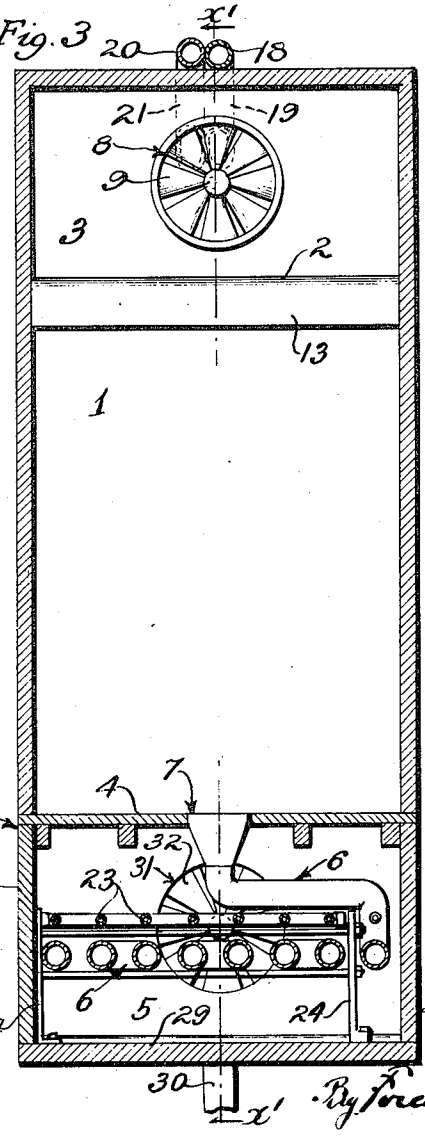


Fig. 3



Witnesses:
Sully Fusso.
George H. Hiles

Inventor
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UNITED STATES PATENT OFFICE.

ANGELO V. ALBERTO, OF LOS ANGELES, CALIFORNIA.

DRIER FOR DEHYDRATING MACARONI AND THE LIKE.

1,185,594. Specification of Letters Patent. Patented May 30, 1916.

Application filed August 31, 1915. Serial No. 48,219.

To all whom it may concern:

Be it known that I, ANGELO V. ALBERTO, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Drier for Dehydrating Macaroni and the like, of which the following is a specification.

This invention relates to devices designed to remove moisture from substances and is particularly designed to dry pastes such as macaroni, spaghetti and the like.

An object of this invention is to produce a device that will effect the dehydrating in such a way that the dehydrated product is of a superior quality.

More particularly an object is to produce a device of this character which will operate to dehydrate substances such as macaroni and spaghetti without bending and distorting the product so as to facilitate packing thereof without breaking said product.

Another object is to so dry material such as macaroni and spaghetti that after said product has been packed for the trade it will not readily break as is so often the case.

By processes and apparatuses heretofore invented pastes, such as macaroni and the like, are not dried to the best advantage, the drying generally taking considerable time and the effect of the drying being such as to dry the surfaces of the pastes and not dry the interior, so that after the pastes are packed in their containers or cartons, the drying process continues and produces great brittleness of the product so that it readily breaks up into small pieces under the conditions of ordinary handling of the packed cartons in shipping.

My apparatus is designed to dehydrate macaroni and the like so that the dehydrating effect is uniform throughout the product and the flavor of the product is preserved and is not lost during the evaporating process.

Another object is to facilitate production of macaroni and the like.

The accompanying drawings illustrate the invention:

Figure 1 is an elevation partly in section on line indicated by x^1—x^1, Figs. 2 and 3 of a drier built in accordance with this invention. Fig. 2 is a plan section on line indicated by x^2—x^2, Figs. 1 and 3. Fig. 3 is a transverse sectional elevation on line indicated by x^3—x^3, Fig. 1, the trucks being omitted.

There is provided a drying chamber 1 separated by an upper partition 2, forming the top of said chamber, from upper blower chambers 3 and separated by a bottom partition 4, forming the bottom of the drier chamber, from a condenser chamber 5 which is provided with a condenser coil 6 formed of relatively large tubes. The condenser coil 6 is connected to an outlet 7 of the drying chamber 1, said outlet being located near the middle of the bottom partition 4.

The blower chambers 3 are provided with air inlets 8, through which air is blown into said chambers by fans 9 mounted on a shaft 10 that is journaled on standards 11 mounted on the upper partition 2, said shaft being provided with a stepped pulley 111 whereby it may be driven at different rates of speed from a suitable prime mover, not shown. The end walls of the blower chambers 3 are provided with inwardly and downwardly slanting portions 12 and the ends of the upper partition 2 are provided with downwardly and outwardly deflected ends 13, said slanting portions and deflected ends being spaced apart from one another to form downwardly directed ports 14 at the ends of the top of the drying chamber.

The product to be dehydrated is placed in the drying chamber 1 and may be supported on trucks 15 as shown in Fig. 1, said trucks being rolled to and from said drying chamber through a suitable opening 16 in one end of said chamber, there being a suitable door 17 to close said opening. The condenser 6 has its exhaust pipe 18 extending through one of the end walls of the condenser chamber and thence upwardly along one end of the drying chamber and thence over the top of one of the blower chambers 3 to the space between the blower chambers, said exhaust pipe 18 being provided at its discharge end with branched portions 19 deflected downwardly and outwardly toward the fans 9 and inlets 8. pipe 20 leading from a suitable source of warm air supply, not shown, extends along the top of the other blower chamber 3 and is provided at its discharge end with branches 21 deflected downwardly and outwardly toward the fans 9 and inlets 8. The condenser coil 6 is cooled by suitable means,

such for example, as sprays of water issuing from perforations 22 in spray pipes 23 which are connected to a suitable source of water supply, not shown, and which extend parallel to and above the longitudinal legs of the condenser coil.

The condenser coil 6 and spray pipes 23 are supported by suitable means such as brackets 24 or equivalents mounted on the floor of the condenser chamber 5. The condenser coil 6 is inclined more or less so that one end is lower than the other and the lower end of said coil is provided at its bends 25 with condensation cups 26 communicating through nipples 27 with the interior of the coil, said condensation cups being provided with drain cocks 28 adapted to discharge onto the bottom 29 of the condenser chamber and said bottom being sloped downwardly and inwardly toward a drain 30 located near the middle of said floor.

The condenser chamber 5 is provided at one end with an air inlet 31 through which air is blown into said chamber by a fan 32 mounted on a shaft 33 which is journaled in a bracket 34 mounted on said end of the condenser chamber, said shaft 33 being provided with a pulley 35 driven from the prime mover, not shown. The air blown through the inlet 31 traverses the condenser coil 6 and discharges through an outlet 36 in the opposite end of the condenser chamber 5. When found desirable ice may be placed on the spray pipe 23 which thus functions as a rack to support the ice in the condenser chamber above the condenser coil. Access may be had to the condenser chamber 5 to place ice therein through openings 37 having doors 38. The condenser coil 6 is provided near the outlet 7 with a damper or valve 39.

I will now describe the operation of the device and the process of dehydrating pastes such as macaroni, it being understood that the invention is not limited in its application to the dehydrating of pastes, but may be used with good results in the curing of tobacco, bologna and the like.

The damper 39 will be closed and, if the temperature of the external air is relatively low, ice will be placed on the rack 23 and warm air will be supplied to the pipe 20, or, if the temperature of the external air is relatively high, the supply of warm air will be shut off and water will be supplied to the spray pipe 23. Then the fans 9 and 32 will be set in motion. The fans 9 force air through the inlets 8 into the lower chambers 3 thence downwardly at the ends of the drying chamber 1 through the ports 14 into said drying chamber. The fans 9 will produce a somewhat higher pressure of air in the drying chamber than atmospheric pressure and then the damper 39 will be opened. The area of the ports 14 is greater than the area of the outlet 7 in order that the higher pressure may be maintained. The air will pass inward and downward in the presence of the macaroni 40 on the trucks 15, extracting moisture from said macaroni and hence becoming heavier and falling to the lower portion of the drying chamber, whence it will pass off through the outlet 7 into the condenser coil 6. The air as it passes through the condenser coil 6 will part with substantially all of the moisture absorbed from the macaroni and will pass through the exhaust pipe 18 to the inlets 8, and will then again be forced as above described, together with such other air as is blown in from the atmosphere by the fans 9, through the drying chamber.

Operation of the fan 32 blows air through the condenser chamber so as to maximize the evaporation of moisture collecting on the condenser coil and produced by the ice or water spray, thereby increasing the cooling effect. From time to time as the condensation cups 26 become filled with moisture condensed in the condenser coil and draining into said cups, said moisture will be drawn off from said cups by opening the drain cocks 28.

From the foregoing it is clear that the air used in the dehydrating operation is used over and over continuously, thus conserving the flavor of the constituents of the pastes or other substance being dehydrated; and that, though the dehydrating air is used over and over, said air is freshened and cooled before returning to the drying chamber, thus maintaining the substances being dehydrated at a uniform temperature.

In practice, I am enabled by the use of my drier and process to dispense almost entirely with the use of artificially heated air for drying pastes, thus minimizing the cost of the dehydrating process; and whereas, before my invention it has taken five, seven and ten days respectively to properly dry different grades of macaroni, it now takes by my process and apparatus for the same grades but sixteen, thirty-six and forty-eight hours respectively, and my product is superior to that produced by the old devices and processes. Thus I make an immense saving in the time necessary to properly dry pastes and therefore increase the production accordingly.

I claim:

1. A drier comprising a drying chamber having downwardly directed air ports at the ends of the top of said chamber and having an air outlet near the center of the bottom of said chamber, a condenser connected to the outlet, a pipe leading from the condenser to the inlet, and a fan to force air through said ports into said drying chamber.

2. A drier comprising a drying chamber

having an air inlet at the upper part thereof and having an air outlet at the lower part thereof, means to force air through the air inlet into said drying chamber, a condenser chamber beneath the drying chamber having an air inlet and an air outlet, a coil in said condenser chamber connected at one end to the air outlet of the drying chamber and connected at the other end to the air inlet of said drying chamber, and means to force air through said condenser chamber.

3. A drier comprising a drying chamber having an inlet and outlet, a condenser chamber below the drying chamber, a condenser coil in the condenser chamber aslant downward toward one end and connected to the drying chamber, a pipe leading from the condenser coil to the inlet, means to force air from the drying chamber through the condenser, spray pipes to spray water on the condenser coil, condensation cups at the lower bends of the condenser coil, and drain cocks for said condensation cups.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 20th day of August 1915.

ANGELO V. ALBERTO.

In presence of—
GEORGE H. HILES,
ANNA F. SCHMIDTBAUER.